The Extension Agent's Handbook for Emergency Preparation and Response

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Introduction

The Extension Agent's Handbook for Disaster Preparedness and Response can be a valuable response tool for you, the Extension agent, in times of emergency or as an aid in preparedness education activities. The Handbook is divided into two parts to provide the information you need in an easy-to-use format. The first section of the Handbook, General Family Preparedness, provides basic information you may need to access quickly in any disaster or emergency situation. It also may be used as a preparedness education tool for the public.

The second section of the Handbook covers 10 disaster specific situations. For the purposes of this manual, a disaster is any event which drastically affects a person's life or livelihood. Floods, fires, hurricanes, tornadoes, winter storms, earthquakes, droughts and volcanic eruptions are considered to be natural disasters, events over which one usually has no control. Radiological and hazardous materials, accidents may be caused by the failure of people to maintain control over the operation, transportation or storage of certain materials. In addition to an overview of the disaster, each section provides a series of preparedness measures and post-disaster responses that should be taken in conjunction with those outlined in the General Family Preparedness section.
This handbook is not intended to cover every situation. It provides basic information you will need for a disaster situation and early post-disaster response. Because every community is different, special consideration for the local area should be taken into account along with the information provided in the Handbook. Pages and sections of the Handbook may be removed and photocopied. Information is structured in a manner conducive to public use. Extension agents are encouraged to provide copies of the material to the public both as "preventive education" and for response needs. This Handbook was developed as a joint effort of Extension Service-United States

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General Family Preparedness

Disasters can affect any part of the United States at any time of the year, swiftly and without warning. Most people don't think of a disaster until it is too late; then they suddenly realize how unprepared they are for the massive changes it makes in their lives. Local officials can be overwhelmed and emergency response personnel may not be able to reach everyone who needs help right away. Each type of disaster requires clean-up and recovery. The period after a disaster is often very difficult for families, at times as devastating as the disaster itself. Families which are prepared ahead of time can reduce the fear, confusion and losses that come with disaster. They can be ready to evacuate their homes, know what to expect in public shelters and how to provide basic first aid.

Family Disaster Supply Kit

One of the first steps toward preparedness is the creation of a family disaster supply kit. This will help families get through the first few days after a disaster. Public shelter after a disaster may not offer some of the basic necessities. The development of a kit will make a stay in a public shelter more comfortable,should it be necessary. Store the kit in a convenient place known to all family members. Store items in airtight bags or containers. Replenish the kit twice a year. Include six basic items: Water,Food,First Aid Kit, Tools and Supplies, Clothing and Bedding, Special Items:

1. Water

Store water in clean plastic containers such as thoroughly washed and rinsed soft drink bottles with tight fitting screw-on caps. Store 1 gallon per day per family member (2 quarts for drinking, 2 quarts for food preparation/ sanitation). Children, nursing mothers and ill people will need more. A 3-day supply of water should be stored for every family member. Replace water every 6 months.

2. Food

Store at least a 3-day supply of non-perishable food. Select foods that require no refrigeration, preparation or cooking and little or no water. If you must heat food, pack a can of sterno. Rotate these foods into the regular diet frequently to keep the supply fresh. In a disaster supply kit include: Ready-to-eat canned meats, fruits and vegetables Canned juices, milk, soup (if powdered, store extra water) Staples such as sugar, salt, pepper High energy foods such as peanut butter, jelly, crackers, granola bars, trail mix, 2-inch and 4-inch sterile gauze pads (4-6 of each), Hypoallergenic adhesive tape, Triangular bandages (3), 2-inch and 3-inch sterile roller bandages (3 rolls each), Scissors, Tweezers, Needle, Moistened towelettes, Antiseptic, Thermometer Tongue blades (2), Sunscreen, Tube of petroleum jelly or other lubricant, Assorted sizes of safety pins, Cleansing agent/soap, Latex gloves (2 pairs), Non-prescription drugs, Aspirin or nonaspirin pain reliever, Anti-diarrhea medication, Antacid (for stomach upset), Syrup of Ipecac (use to induce vomiting if advised by the Poison Control Center), Laxative, Activated charcoal (use if advised by the Poison Control Center)

4. Tools and Supplies

Various tools and supplies may be needed for temporary repairs or personal needs. Include these items in your disaster supply kit:

- Battery operated radio and extra batteries
- Flashlight and extra batteries
- Non-electric can opener, utility knife
- Map of the area (for locating shelters)
- Cash or traveler's checks, change
- Fire extinguisher: small canister, ABC type
- Tube tent
- Pliers
- Tape
- Compass
- Matches in waterproof container
- Aluminum foil
- Plastic storage containers
- Signal flare Paper, pencil
- Needles, thread
- Medicine dropper
- Shut-off wrench, to turn off household gas and water
- Whistle
- Plastic sheeting
- Mess kits or paper cups, plates and plastic utensils
- Emergency preparedness manual
- Sanitation
- Toilet paper
- Soap, liquid detergent
- Feminine hygiene supplies

Personal hygiene items
Plastic garbage bags, ties (for personal sanitation uses)
Plastic bucket with tight lid
Disinfectant
Household chlorine bleach

5. Clothing and Bedding
Your disaster supply kit should include at least one complete change of clothing and footwear per person. Items to include are:
Sturdy shoes or work boots
Rain gear Blankets or sleeping bags
Hat and gloves
Thermal underwear
Sunglasses

6. Special Items
Family members may have special needs. Other items you may add to your kit include:
For Babies:
Formula, Diapers, Bottles, Powdered milk, Medications,

For Adults:
Heart and high blood pressure medication, Insulin, Prescription drugs, Denture needs, Contact lenses and supplies, Extra pair of eye glasses, Games and books.

Important Family Documents:
Keep these in a waterproof, portable container. Wills, insurance policies, contracts, deeds, stocks and bonds, Passports, social security cards, immunization records, Bank account numbers, Credit card account numbers and companies,Inventory of valuable goods, important telephone numbers,Family records (birth, marriage,death certificates)

4-Step Family Preparedness Plan

In addition to your family disaster supply kit, develop a family preparedness plan. This plan needs to be known to all family members. A basic preparedness plan has four steps: Do your homework Create a family disaster plan Make a checklist and periodically update it Practice and maintain your plan

1. Do your homework
Find out what disasters could happen in your area. Contact your local emergency management or civil defense office and American Red Cross chapter to:
Learn which disasters are possible where you live and how these disasters might affect your family.

Request information on how to prepare and respond to each potential disaster.

children's school or day-care center, as well as other places where your family spends time.

Develop a list of important telephone numbers (doctor, work, school, relatives) and keep it in

a prominent place in your home. Ask about animal care. Pets may not be allowed inside shelters

because of health regulations.

2. Create a family disaster plan

Discuss with your family the need to prepare for disaster. Explain the danger of fire, severe weather (tornadoes, hurricanes) and floods to children. Develop a plan to share responsibilities and how to work together as a team. Discuss the types of disasters that are most likely to occur and how to respond. Establish meeting places inside and outside your home, as well as outside the neighborhood. Make sure everyone knows when and how to contact each other if separated. Decide on the best escape routes from your home. Identify two ways out of each room. Plan how to take care of your pets. Establish a family contact out-of-town (friend or relative). Call this person after the disaster to let them know where you are and if you are okay. Make sure everyone knows the contact's phone number. Learn what to do if you are advised to evacuate.

3. Make a checklist and periodically update it

Post emergency telephone numbers by phones (fire, police, ambulance, etc.). Teach your children how and when to call 911 or your local EMS number for help. Show each family member how to turn off the water, gas and electricity at the main valves or switches. Teach each family member how to use a fire extinguisher (ABC type) and have a central place to keep it. Check it each year. Install smoke detectors on each level of your home, especially near bedrooms. Conduct a home hazard hunt. Stock emergency supplies and assemble a disaster supply kit. Learn basic first aid. At the very least, each family member should know CPR, how to help someone who is choking and first aid for severe bleeding and shock. The Red Cross offers basic training of this nature. Identify safe places in your home to go for each type of disaster. Check to be sure you have adequate insurance coverage.

4. Practice and maintain your plan

Test children's knowledge of the plan every 6 months so they remember what to do. Conduct fire and emergency evacuation drills. Replace stored water and food every 6 months. Test your smoke detectors monthly and change the batteries once a year.

And... In conjunction with the preparedness plan, working with neighbors can save lives and property. Meet with neighbors to plan how the neighborhood could work together after a disaster until help arrives. Members of a neighborhood organization, such as a home association or crime watch group, can introduce disaster preparedness as a new activity. Know your neighbors' special skills (medical, technical) and consider how to help neighbors who have special needs, such as disabled and elderly persons. Make plans for child care in case parents can't get home.

Preparing Children for Disaster

As you develop your preparedness plan, include children in the planning process. Teach your children how to recognize danger signals. Make sure they know what smoke detectors and other alarms sound like. Make sure they know how and when to call for help. If you live in a 9-1-1 service area, tell your child to call 9-1-1. If not, check your telephone directory for the number. Keep all emergency numbers posted by the phone. People with disabilities may need to take additional steps to prepare for disaster. If you are disabled or know someone who is, the following precautions should be taken. Ask about special assistance that may be available to you in an emergency. Many communities ask people with disabilities to register, usually with the fire department or emergency management office, so needed help can be provided quickly in an emergency. If you currently use a personal care attendant obtained from an agency, check to see if the agency has special provisions for emergencies (e.g. providing services at another location should an evacuation be ordered).

Determine what you will need to do for each type of emergency. For example, most people head for a basement when there is a tornado warning, but most basements are not wheelchair accessible. Determine in advance what your alternative shelter will be and how you will get there. Learn what to do in case of power outages and personal injuries. Know how to connect or start a

back-up
power supply for essential medical equipment. If you or someone in your household uses a
wheelchair, make more than one exit from your home wheelchair accessible in case the primary
exit is blocked. Consider getting a medic alert system that will allow you to call for help if you are
immobilized in an emergency. Store back-up equipment, such as a manual wheelchair, at a
neighbor's home,school or your workplace. Avoid possible hazards by fastening shelves to the wall
and placing large, heavy objects on the lower shelves or near the wall. Also hang pictures or
mirrors away from beds. Bolt large pictures or mirrors to the wall. Secure water heaters by
strapping them to a nearby wall.

Special Preparations for the Hearing Impaired

Deaf or hearing impaired individuals will have a more difficult time communicating after a
disaster. People may not realize you can't hear warning signals and instructions, and may leave
you behind. If there is a power failure, your teletypewriter will be useless, and communicating in
the dark will require a flashlight. To avoid potential problems you should:

Make sure you have a flashlight, pad and pencil by your bed at home. Ask a neighbor to be
your source of information as it comes over the radio. Remind co-workers that you can't hear an
evacuation
order. If you are trapped in a room, knock on the door or hit objects together to let others know
you are there.

Special Preparations for the Visually Impaired

Blind or visually impaired individuals will have a difficult time after a disaster if surroundings
have been greatly disrupted. In addition, seeing eye dogs may be too frightened or injured to be
reliable. Have an extra cane at home and work, even if you have a seeing eye dog. If you are
trapped, make noise to alert others. Also keep in mind that, if electricity fails, blind people can
assist sighted people and potentially save lives.

Evacuation Procedures

Evacuations during a disaster are a common event. Evacuation procedures vary by location and

disaster. Contact your local emergency management or civil defense office for specific evacuation plans. The amount of time you will have to evacuate depends on the disaster. Some disasters,such as hurricanes, may allow several days to prepare. Hazardous materials accidents may only allow moments to leave. This means that preparation is essential since there may not be time to collect the basic necessities. Evacuations can last for several days. During this time you may be responsible for part or all of your own food, clothing and other supplies.

Preparing for Evacuation

Advance planning will make evacuation procedures easier. First, you should have your family disaster supply kit and plan ready. Additional steps that can aid preparedness include:

1. Review possible evacuation procedures with your family. Ask a friend or relative outside your area to be the check-in contact so that everyone in the family can call that person to say they are safe. Find out where children will be sent if they are in school when an evacuation is announced.

2. Plan now where you would go if you had to evacuate. Consider the homes of relatives or friends who live nearby, but outside the area of potential disaster. Contact the local emergency management office for community evacuation plans. Review public information to identify reception areas and shelter areas.

3. Keep fuel in your car's gas tank at all times. During emergencies, filling stations may be closed. Never store extra fuel in the garage.

4. If you do not have a car or other vehicle, make transportation arrangements with friends, neighbors or your local emergency management office.

5. Know where and how to shut off electricity, gas and water at main switches and valves. Make sure you have the tools you need to do this (usually pipe and crescent or adjustable wrenches). Check with your local utilities for instructions.

Evacuating

When you are told to evacuate there are four steps you need to take:

1. If there is time, secure your house. Unplug appliances. In a flood hazard area, store propane tanks or secure them safely to the structure. Turn off the main water valve. Take any actions needed to prevent damage to water pipes by freezing weather, if this is a threat. Securely close and lock all doors, windows and garage.

2. Follow recommended evacuation routes. Do not take shortcuts, they may be blocked.

3. Listen to the radio for emergency shelter information.

4. Carry your family disaster supply kit.

Returning Home After the Disaster

1. Do not return until the local authorize doing so. There may be leaking gas or other flammable materials present. Use battery-operated flashlights for light. If you suspect a gas leak, do not use any kind of light. The light itself could cause an explosion.

5. If you smell leaking gas, turn off the main gas valve at the meter. If you can open windows safely, do so.

Do not turn on lights they can produce sparks that may ignite the gas.
Leave the house immediately and notify the gas company or the fire department.

Do not reenter the house until an authorized person tells you it is safe to do so.

6. Notify the power company or fire department if you see fallen or damaged electrical wires.

7. If any of your appliances are wet, turn off the main electrical power switch in your home before you unplug them. Dry out appliances, wall switches and sockets before you plug them in again. Call utility companies for assistance.

8. Check food and water supplies for contamination and spoilage before using them.

9. Wear sturdy shoes when walking through broken glass or debris, and use heavy gloves when removing debris.

10. After the emergency is over, telephone your family and friends

to tell them you are safe.

When Disaster Strikes

Hopefully you will never have to experience disaster. When it does happen, however, try to remain calm and patient and put your family preparedness plan into action. You should follow the following steps:

Retrieve your disaster supply kit.

Wear protective clothing and sturdy shoes.

Confine or secure pets to protect them.

Go to the safe place in your home you identified and stay there until well after the disaster is over.

Listen to your battery-powered radio for news and instructions.

Evacuate, if advised to do so.

The Role of Government After a Disaster

After a preliminary damage assessment report has been completed, the governor of a state can request a major disaster or emergency declaration from the president.

Declaration of an Emergency. The president can issue a Declaration of Emergency to supplement the state and local effort to save lives and protect property. The president can act only after a state governor has requested a Declaration of an Emergency be issued. Total assistance provided in any given emergency declaration may not exceed $5 million. Declaration of a Major Disaster. A major disaster declaration may be requested by the governor to the president after a natural catastrophe occurs. Assistance is offered to both the public and private sectors. With the declaration, the Federal Emergency Management Agency (FEMA) has the authority to engage the services of 12 federal departments, two agencies, one commission, one corporation and one authority offering 97 different Federal assistance programs. These 97 programs provide many different services to help people and state and local governments deal with recovery from a disaster. A listing of the main agencies that provide assistance can be found in General Family Preparedness, Insurance and Resources After a Disaster.

Emotional Recovery After a Disaster

In addition to the physical damage a disaster brings, stress and emotional disequilibrium need to be addressed by victims. Steps you

can take to reduce the effects of a disaster include:

Be extra patient.

Keep in mind that other people may have a different viewpoint about what should be top priority.

Realize that it will take time to restore things, both physically and e

for them to express disbelief, sadness, anger, anxiety and depression. Also realize that these emotions and moods can change unexpectedly.

Helping Children Cope After a Disaster

Children may require special attention after experiencing a disaster. Four common fears children have are death, darkness, animals and abandonment. In a disaster children may experience any or all of these. You should encourage children to talk about what they are feeling and to express this through play, drawing or painting.

A child's reaction to a disaster may vary depending on age, maturity and previous experience. In all cases it is important to acknowledge what happened and take time to talk with children about their fears.

Some behaviors you may find children exhibiting after a disaster include:

Being upset at the loss of a favorite toy, blanket, teddy bear, etc.

Hitting, throwing or kicking to show their anger and frustration.

Fear of the disaster coming again.

Fear of being left alone or sleeping alone. They may want to sleep with another person.

Behaving as they did when they were younger, including wetting the bed, sucking their thumb, wanting to be held, etc.

Exhibiting symptoms of illness such as nausea, fever, headaches, not wanting to eat, etc.

Becoming quiet and withdrawn. Becoming easily upset.

Feeling that they caused the disaster in some way.

Feeling neglected by parents who are busy cleaning up or rebuilding.

Refusing to go to school or to be out of the parent's sight.

Parents and other adults can help children come to terms with their

feelings in several ways.

Let children know you love them and they can count on you. Reassure them that they are not responsible for what occurred.

Talk with your children about your own feelings.

Give simple, accurate answers to children's questions.

Hold them. Close contact assures children you are there for them and will not abandon them.

Let children grieve for a lost toy or blanket that was special to them. It will help them cope with their feelings.

Provide play experiences to relieve stress.

Repeat assurances and information as often as you need to; do not stop responding.

Spend extra time putting children to bed at night.

Listen to what children say. Repeat their words to clarify what they are feeling. If additional help is needed for adults or children, contact a community resource such as a counseling center, minister or mental health agency.

Food Safety

Food safety precautions can make an important difference after a disaster occurs. Food can become contaminated as a result of fire, flood and wind related exposure. It also may spoil or become unsafe after a power outage.

Precautions Against Power Outages

If your area comes under an advisory that may lead to prolonged power outages (hurricanes, prolonged flooding, etc.) take these steps to help keep your food safe:

Turn your refrigerator and freezer to the coldest setting. This will help the food stay frozen. Purchase a 50-pound block of dry ice.

This will keep food in a full 18 cubic foot freezer safe for 2 days. Wrap it in brown paper for longer storage. Separate it from direct food contact with a piece of cardboard.

Fill partially filled freezers with crumpled newspaper to reduce air currents which will dissipate dry ice.

After a Power Outage

If you should lose power, the emergency food supplies in your family

disaster supply kit will be safe. Food in the refrigerator and freezer may be in trouble.

Generally, food in a refrigerator will be safe if the following measures should be taken.

Group meat and poultry to one side, or on a tray, so their juices won't contaminate other foods if they begin to thaw.

Be wary of using meat, poultry and foods containing milk, cream, sour cream or soft cheese.

Don't rely on odor or appearance of food. If perishable food has been at room temperature for more than 2 hours, discard it.

In emergency conditions, the following foods should keep at room temperature (above 40øF) a few days. Discard anything that turns moldy or has an unusual odor or look.

Butter, margarine

Fresh fruits and vegetables

Dried fruits and coconut

Opened jars of salad dressing, peanut butter, jelly, relish, taco sauce, barbecue sauce, mustard, catsup, olives

Hard and processed cheeses

Fruit juices

Fresh herbs and spices

Flour and nuts

Fruit pies

Bread, rolls, cakes and muffins Discard the following foods if kept for more than 2 hours above 40øF.

Raw or cooked meat, poultry and seafood

Milk, cream, yogurt, soft cheese

Cooked pasta, pasta salads

Custard, chiffon or cheese pies

Fresh eggs, egg substitutes

Meat topped pizzas, lunchmeats

Casseroles, stews or soups

Mayonnaise and tartar sauce

Refrigerator and cookie doughs

Cream filled pastries

Refreeze thawed foods that still contain ice crystals or feel cold.

Tornado and Wind Related Contamination

If you live in an area that has sustained tornado or wind damage, take the following measures.

Drink only approved or chlorinated water.

Consider all water from wells, cisterns and other delivery systems in the disaster area unsafe until tested. Check foods and discard any containing particles of glass or slivers of other debris.

Discard canned foods with broken seams.

Flooded Food Recovery

Flood waters may carry contaminants such as silt, raw sewage or chemical waste. Disease bacteria in the water also can contaminate any food it touches. If you have experienced flood conditions, follow these guidelines:

Save undamaged commercially canned foods (except as noted later). Do not use home-canned foods that have been covered with flood water. Commercial glass jars of food are safe if the containers are sanitized (except as noted later). Remove the labels from jars and cans and mark the contents on can or jar lid with indelible ink. Paper can harbor dangerous bacteria. To sanitize jars, cans, dishes and glassware, wash in a strong detergent solution with a scrub brush. After washing, immerse them in a solution of 2 teaspoons chlorine bleach per gallon of room temperature water. Air dry before using. If needed, clean empty glass also may be sanitized by boiling in water for 10 minutes. To sanitize metal pans and utensils, boil

in water for 10 minutes. Discard wooden and plastic utensils, baby nipples, pacifiers and any other porous nonfood items that are used with food. Discard the following foods:

Meat, poultry, fish and eggs

Fresh produce

Preserves sealed with paraffin

Unopened jars with waxed cardboard seals such as mayonnaise and salad dressing

All foods in cardboard boxes, paper, foil, cellophane or cloth

Spices, seasonings and extracts

Home-canned foods

Opened containers and packages

Flour, grain, sugar, coffee and other staples in canisters

Dented, leaking, bulging or rusted cans

Food Safety After a Fire

Fire and fire retardant chemicals release toxic fumes that contaminate food.

Discard any type of food stored in permeable packaging such as cardboard or plastic wrap. Discard raw food outside the refrigerator. Food in refrigerators and freezers also may be contaminated. The seal on these appliances is not completely airtight. Discard any food with an off-flavor or smell. The chemicals used to fight fires contain toxic material that can contaminate food and cookware. Throw away foods exposed to the chemicals. Chemicals cannot be washed off the food. This includes foods stored at room temperature, as well as foods stored in permeable containers such as cardboard and screw-topped jars and bottles.

Sanitize canned goods and cookware in the same method as recommended for flooded foods.

Insurance and Resources After a Disaster

Most homeowner policies offer coverage for losses due to natural disasters except flooding. If you are unsure what your policy covers, check it before a disaster happens. Contact your agent for

clarification if you are still unsure. In general most insurance policies cover:

Your house, rental units that are part of the building and any attachments to the building, such as the garage.

Structures on the grounds that are not attached to the house, such as a pool, gazebo, tool shed, etc. This also includes the lawn, trees and shrubs on the property. Vacant land you own or rent, with the exception of farmland.

Cemetery plots or burial vaults you may own.

Personal possessions, including those of members of your household and guests, and contents of the house. This does not include the possessions of tenants in your home.

Any items that have been loaned to you, or given for safe keeping.

Living expense if your home is unlivable due to damage.

Rental payments, if you rent one part of your house but it is unlivable due to damage.

Responsibility for unauthorized use of your credit cards, forged checks or counterfeit currency accepted in good faith.

Settlement, medical expenses and court costs brought against you for bodily injury of others or damage to the property of others.

Most homeowner policies DO NOT cover loss due to flooding. You should check to see if your community participates in the National Flood Insurance Program.

If you need financial assistance, programs are available. Programs include:

The American Red Cross...offers emergency assistance for groceries, new clothes, medical needs and immediate building repairs.

The Farmers Home Administration(FmHA)...offers agricultural loans only when other credit is not available. Qualifying farmers can get short-, medium- or long-term loans with moderate interest.

Federal Crop Insurance Corporation (FCIC)...Farmers can insure crops for 50, 65 or 75 percent of yield. Unavoidable losses due to any adverse weather conditions including drought, excessive

moisture, hail, wind, hurricanes, tornadoes and lightning are covered. Unavoidable losses due to insect infestations, plant diseases, floods, fires and earthquakes also are covered. You must have this insurance prior to the disaster.

Small Business Administration (SBA)...offers medium- and long-term loans for rebuilding non-farm homes and small businesses with moderate interest rates.

Commercial and federal land banks offer loans for home repair and improvement, land,equipment and livestock. Insurance companies offer long-term loans at relatively high interest for the same things. Assistance also may be available through a variety of state or local agencies and volunteer groups. Listen to your battery operated radio after a disaster for information on disaster relief services and locations.

Non-financial resources The Agricultural Stabilization and Conservation Service (ASCS)...for information on livestock and wildlife feeding, production and conservation practices.

The Animal and Plant Health Inspection Service (APHIS)...offers technical assistance on animal and plant pests and diseases.

Extension Service-USDA...offers information, educational material and advice on cleanup.

The Food Safety Inspection Service (FSIS)...can be reached toll free at (800) 535-4555 for questions on the safe handling of meat and poultry.

Special Post-Disaster Considerations

Restoring Flooded Water Systems

Do not start submerged electric motors until they have been cleaned, dried and checked for safety. Disconnect the motor. An ejector or jet pump motor may be a separate unit mounted on the pump, or the end bell of the motor may be part of the pump. The separate motor unit can be disconnected and serviced easily. With the second type, remove the pump and motor as a unit. It is not necessary to remove the drop pipes. Take the motor to an electrical repair shop. In the shop, the motor should be checked for any short circuits or grounding caused by moisture. If the motor was submerged in mud and water, it should be

thoroughly cleaned. Windings should be dried in a drying oven. The bearings should be
lubricated before you use the motor again. Clean and dry electrical controls and pressure switches.
Check all wiring for short circuits. Pumps usually are damaged by sediment deposited in the
bearings. Clean pumps. Check valves for silt and sand. Remove all dirt and water from the gears
in the gear box and replace the lubricant with fresh oil. Submersible pumps. The bearings on
water lubricated pumps will not be damaged by flood waters, since these bearings are constantly
submerged in water. As soon as possible, flush clean water down the casing to remove the
sediment and silt. Then disinfect the well. Centrifugal pumps.
Many centrifugal pumps contain two sets of oil-lubricated bearings along the drive shaft between
the motor and the pump. If the pump has been flooded, dismantle the container bracket and
remove the bearings. Clean the bearings, or install new bearings if the old ones are worn out.
Close-coupled centrifugal pumps contain no bearings, so there is little chance of flood damage
except to the electric motor. Injector-type pumps. These pumps usually contain watertight packing
at the ground surface, with sealed impellers. Flood waters probably will not damage this type of
pump. The storage tank and piping should be all right unless muddy water was pumped through it.
If tank is contaminated, disinfect the entire system with a strong chlorine solution. Use 1 quart
household laundry bleach or check with local health department for recommended solution
strength. Open all faucets while the system is being filled. Do not close the spigot until a definite
smell of chlorine is evident. Do not use the system for 24 hours. Then start the pump and run
water from all faucets until the chlorine odor is gone.
Wells probably will not be damaged structurally from floods, but they may be contaminated. Have
your well tested by health officials before you use the water after sterilizing the walls of the well
casing. Leave it there at least 4 hours, or preferably overnight. Pump the chlorinated water into
the piping system, and leave it there for at least 2 hours or even overnight. The next day, pump
and flush out the system until the taste and odor of chlorine are no longer apparent. Two days
after you have disinfected the water system take a sample of water according to recommended
procedures and have it tested for purity. Boil or treat all drinking water until a water test indicates
that water is safe for all purposes. Do not drink water from a flooded cistern until you disinfect the

cistern and the entire piping system.

To disinfect the cistern: Use an auxiliary pump to remove the water and empty the cistern. Do not pump water through the pipeline distribution system. Wash down the walls and ceiling with clean water, and pump out the dirty water with an auxiliary pump. Check the cistern walls, ceiling and floor for cracks where groundwater could come in. Disinfect the interior with a solution of 1 quart laundry bleach in 3 gallons of water. Be sure the bleach contains no soap. Apply the chlorine solution with a sprayer or scrub with a stiff broom. Swab or pump out the disinfecting solution that collects in the bottom of the cistern. Leave the chlorine solution in the pipes for at least 2 hours (overnight if possible) before you drain them. Fill the cistern with water for use. This water will have a chlorine taste for awhile, but it will be safe for all purposes. Regenerate water softeners before you use them. Use clean chlorinated water to backwash the filterbed.

Disinfecting Wells Disinfect flooded wells before they are used as a source of drinking water. To disinfect a well: Scrub the pumproom and wash all equipment, including piping, pump and pressure tank. Remove the well seal at the top of the casing. Pour a solution of 1 quart laundry bleach and 3 gallons of water into the top of the well. Pour the solution so it washes down the inside of the casing and the outside of the drop pipes. In some wells you will need only to remove a plug from the seal to pour the solution into the well. Leave the solution in the well about 4 hours. Then pump it into the pressure tank and distribution system. Draw the chlorinated water into all piping by opening each faucet until the odor of chlorine is apparent. Leave the chlorine in the piping at least 2 hours. Then run the water until the taste and odor are no longer objectionable.

Disposing of Animal Carcasses

Prompt and sanitary disposal of animal carcasses is necessary to protect the living animals in an area from disease. Search all pastures for dead animals as soon as possible. Carcasses may have some commercial value, so send them to a rendering plant if possible. If rendering is impractical, dispose of the dead animals on the premises. Use the following procedure:

Immediately after finding a carcass, cover it with crude oil or kerosene to keep away dogs, buzzards and vermin. Fat swine are the only animal carcasses that will burn satisfactorily. Used

railroad ties can be used as starters. Bury other carcasses. Use power equipment if it is available.
Choose a site where subsurface drainage will not reach water supplies. Bury the carcasses at least 3
to 4 feet deep so predatory animals won't get at it.

Drought
Water Conservation
Water conservation is defined as the efficient use of water so that unnecessary or wasteful uses are
eliminated. In many areas, more groundwater is drawn out of the aquifers each year than is
recharged through rainfall and stream flow. As a result, groundwater levels have dropped
dramatically. Demand for water from a state's streams and reservoirs may rapidly approach the
available long-term supply. Across many states, many communities are regularly required to limit
water use at some time during the year. While some additional water supplies can be developed by
constructing new reservoirs, in many locations the demand for water will still equal or exceed the
available long-term supply. For these towns and cities, water conservation can make the difference
between adequate supplies and shortages. Importantly, the way water is used and, in some
instances, wasted must be rethought. This section explains easy ways that water can be conserved
and money can be saved at the same time. Useful information is also provided on how to measure
home water use, how simple repairs can be made, and how water-saving devices are installed. In
addition to the measures found in this section, also refer to the General Family Preparedness
section found at the beginning of this handbook.

Water Conservation at Home
There are dozens of ways to conserve water and save money around the home. As a starting
point, To determine whether a low-flow showerhead needs to be installed, check the flow rate of
the current showerhead by using the water meter or by putting a gallon container under the
showerhead while the water is on and measuring the time it takes to fill the container at the usual
shower setting. If it fills in less than 20 seconds, the flow is greater than 3 gallons per minute.
Low-flow showerheads can be purchased at most department, hardware and plumbing stores.
Models costing from under $3 are available. A showerhead can usually be installed in 10 minutes.
Place displacement devices in the toilet. Three types of displacement devices can be used in

toilets, but they should not be used in newer, low-water use toilets which use less than 3« gallons per flush. To determine the capacity of the toilet tank, either turn off the water supply valve to the toilet (usually located on the pipe behind the toilet) or hold the float ball up so that the tank does not refill, and flush the toilet. Measure the capacity of the tank by filling it to the normal level with a gallon container. Toilet dams can be installed in toilet tanks to reduce the amount of water used, typically saving « to 2 gallons per flush. Toilet dams are available from many utilities or from most plumbing supply stores from under $5 per pair. A plastic bottle filled with water and weighted down with a few stones can accomplish the same purpose as dams. It is important to place the bottle in the toilet tank where it will not interfere with the flushing mechanism. A plastic bottle in the tank will save « to 1 gallon per flush. A toilet bag which is available free of charge from many utilities, can also be used in place of dams. A displacement bag in the tank will save « to 1 gallon per flush. Bricks should not be used in the tank because small pieces can break off and permanently damage the plumbing system. Install faucet aerators. The standard faucet flow rate is 5 gallons a minute. A low-flow aerator can reduce this flow to approximately 2« gallons a minute while still providing adequate water for washing and rinsing. Installing aerators on the kitchen sink and lavatory faucets will save hot water and cut water use by as much as 60 gallons a month for a typical family of four. Most aerators have either internal or external threads. Before purchasing aerators, the location of the threads and the diameter of each spout should be determined. If the faucet already has a standard aerator (not a low-flow type), it can be removed and taken to the store to ensure that the correct low-flow size is purchased. Aerators are available for less than a dollar from most stores that sell plumbing fixtures.

Water Conservation

If the kitchen has a portable dishwasher that must be connected to the faucet, do not install a low-flow aerator because the reduced flow may affect the performance of the dishwasher and result in dishes that are not properly cleaned. Change your water use patterns. The washing machine and dishwasher should only be used when fully loaded. This practice can save at least two loads or approximately 60 gallons each week. Examine personal water use habits. Changing

tooth brushing habits can save as much as 14 gallons of water to water utilities, leaks can easily account for 10 percent of a water bill and waste both water and energy if the source is a hot water tap.

Toilet Leaks.

When a toilet leaks, water escapes from the tank into the bowl. Toilets are notorious for hidden or silent leaks, because leaks are seldom noticed unless the toilet "runs" after each flush (which can waste 4 to 5 gallons a minute). To determine if the toilet is leaking, look first at the toilet bowl after the tank has stopped filling. If water is still running into the bowl or if water can be heard running, the toilet is leaking. Often the toilet may have a "silent leak." To test for a silent leak, mix a few drops of food coloring or place a dye capsule or tablet (available from many utilities and hardware stores) into the water in the toilet tank after the water has stopped filling and the tank is full. Do not flush the toilet. Wait for about 10 minutes, and if the dye or food coloring appears in the toilet bowl, the toilet has a silent leak. Leaks of this type usually are caused by a defective flush valve (flapper) ball or a corroded or scaled valve seat. Replacement balls and valves, which can be installed in less than 30 minutes, are available from most hardware and plumbing stores for under $3.

Faucet Leaks.

Faucet leaks are obvious. However, periodically check seldom used taps in the basement or outside the house. The cause of faucet leaks is frequently a worn washer that can be replaced with two or three hand tools. Replacement washers can be purchased from most hardware and variety stores and cost only a few cents.

Use efficient outside watering practices. Plant native vegetation. Once established, which usually takes two years, these plants require less frequent watering. Water grass only when needed. If grass springs up after being walked on, it does not need watering. Soak grass long enough for water to reach the roots. Water slowly and deeply. Water during the cool, early morning hours to minimize water loss by evaporation and discourage disease. Do not water on windy days. Use sprinklers that produce droplets instead of mist and that have a low trajectory. This type of sprinkler will lose less water by evaporation and be less affected by the wind. Use drip irrigation

systems for shrubs, flowerbeds and other frequently watered areas. During the summer, keep the grass about 2 to 3 inches high. This height shades the root system and holds soil moisture better than does a closely clipped lawn. Do not water streets and sidewalks. Adjust the hose or sprinkler until it waters just the grass or shrubs. For flowerbeds, shrubs and trees, use drip or soaker systems.

Reading a Water Meter To Measure Leaks

If your house has a water meter, the entire plumbing system can be checked for an undetected leak in five easy steps: 1. Find the water meter. (It may be outdoors or hidden in a dark corner of the basement.) 2. Turn off all running water and water-using appliances, and do not flush the toilet. 3. Read the dial (or dials) and record the reading.

4. After 15 to 20 minutes, re-check the meter.

5. If no water has been turned on or used and the reading has changed, a leak is occurring. The rate (gallons per minute) of the leak can be determined by dividing pipe. This is often the case when the neck ends in a ball joint. Most necks can be unscrewed and replaced, or an adaptor can be used. Adapters or replacement necks are readily available in plumbing and most hardware stores. When installing the new showerhead, teflon tape or pipe joint compound could be applied to the exposed threads of the new neck so that the joint will be sealed and provide a leakproof connection. If the shower neck has been on for a few years and the neck joint is too stiff to unscrew with moderate pressure, consider having a plumber replace it.

Installing Shower Flow Restrictors to Conserve Water

Restricting devices fit into the space between the showerhead and the shower neck. These devices range from a simple washer with a small hole in it to small chrome-plated pressure compensating fittings. While restrictors reduce water flow, low-flow showerheads produce a flow that is more satisfying to most individuals. Installing Toilet Dams, Toilet Bags and Plastic Bottles to Conserve Water Many of the toilets in homes today use from 5 to 7 gallons per flush. Several effective retrofit devices are available that can reduce the volume of water used with each flush by 2 to 3 gallons. While these devices can be used in some of the low-flush toilets on the market today that use from 3 to 4 gallons per flush, they generally perform better when used in the older 5- to

7-gallon per flush models. The height of water in the toilet tank (not just the volume) causes the bowl to flush, so the purpose of displacement devices is to reduce the volume of water used in each flush without affecting water height in the tank. The following three types of devices have proven to be effective.

1. Toilet Dams: To install a dam, flex or bend the dam and insert it into the tank. The dam should fit tightly against the tank sides and bottom and should curve outward away from the plumbing fixtures in the tank. Most tanks work best when a single dam is used.

2. Toilet Bags:
Fill the bag with water, securely seal the top of the bag with the bag clamp and hang the bag in the tank by using the bag clip and hanger that are provided. Make sure the bag is located in the tank so it does not interfere with the operation of the toilet tank.

3. Plastic Bottles:
Fill a plastic bottle with water and weight down with a few stones, and place in the most open portion of the tank. This will save as much water as is displaced by the bottle. Make sure the bottle does not interfere with the operation of the moving parts of the tank. Check all such devices periodically to ensure that they remain in place.

Water Saving Steps When Remodeling or Replacing Fixtures and Appliances

1. Hot Water Pipes.
Where possible, insulate hot water pipes from the hot water heater to fixtures and appliances. This will reduce the time between turning the water on and the time hot water comes out of the faucet and reaches a constant temperature.

2. New or Replacement Fixtures and Appliances.
Install low-water use fixtures when remodeling or replacing fixtures. Install toilets that use 3« gallons or less per flush. Install low-flow showerheads that flow at 3 gallons or less per minute. Install water-saving dishwashing and clothes-washing machines. Be sure to check the water efficiency of appliances when shopping for replacement appliances.

3. Pools and Hot Tubs.
Simple repair steps that can be done without contacting a plumber are listed below.

1. If the water is too high in the toilet tank and is spilling into the overflow tube, the float can be adjusted by turning the adjustment screw or by very gently bending the float arm down so that the

water shuts off at a level slightly below the top of the overflow tube. Ideally, the water level should be set so that it is about even with the fill line on the back of the toilet tank.

2. A frequent problem that causes a toilet to leak is a worn flapper ball or a flapper ball that does not seat properly into the valve seat. If the flapper ball is worn, it can be removed and replaced with a new flapper ball. When replacing a flapper ball, take care to note how the chain is adjusted before the old ball is removed. Also, check the valve seat for scale or corrosion and clean if necessary. If cleaning does not work, install a retrofit valve seat, available from most plumbing or hardware stores.

3. If the handle needs to be jiggled to keep the toilet from "running," the guide-wire or the handle itself may be sticking. If the handle is sticking, adjust the nut that secures it in the toilet tank. If that does not work, replace the handle.

4. If none of the preceding steps solve the problem, contact a plumber to repair the toilet.

Repairing Faucet Leaks

1. Leaky faucets, which can develop even in new houses, are wasteful and a nuisance. With a few simple tools, a leaky faucet can be repaired in less than an hour.

2. Most water faucets in houses today are compression-type units in which a washer is compressed over a pipe opening when the faucet is closed, thus closing off the water. All compression-type faucets may not look alike, but all are similar in their operation and repair.

3. The exact point where a leak appears on a faucet is a good clue to finding its cause:
A spout drip is usually caused by a worn upper faucet washer or a corroded seat. Leaks at the stem result from a loose cap nut or worn cone or bonnet packing. A cap leak, or water oozing below the cap nut, indicates a worn bib or packing washer. A leak at the base of the faucet results from water seeping past a worn lower faucet washer.

4. To repair a leaky compression type faucet, use the following steps:
Turn off the water supply at the valve nearest the faucet. Next, open the tap to drain the faucet.
Remove the handle screw and lift handle off the spindle. Unscrew the cap nut. Use a protective

cover of adhesive tape or a rag to avoid marring the finish. Unscrew the stem with finger pressure and lift it out. Remove the screw from the bottom end of the spindle. Scrape away all worn washer parts. Be careful not to damage the rim. Install a new washer. (Take either the old washer or the complete spindle unit with you to purchase the correct size and shape (flat or conical) replacement washer.) Double-check to make sure the replacement is like the worn washer. Check the seat (which is located down inside the faucet) to make sure it is not pitted or rough. If the seat is scarred or rough, use a seat-dressing kit to grind the seat to a smooth finish. A leak at the stem usually means that the packing inside the cap nut needs replacing. To replace the packing, pry out the old packing washer with a screwdriver. If a washer is used, replace it with a new one. If there is no washer, wrap the spindle tightly with "packing wicking." String can be used if commercial wicking is not available. Reassemble the faucet. Tighten the cap nut just enough to prevent leaking. Screwing the nut down too tightly causes rapid wear on the stem. Turn the shutoff valves to the on position and check the faucet for leaks.

5. A mixing faucet may look more complicated than a single faucet, but repairs are made in much the same way. Actually, a mixing faucet is two separate units with a single spout. Mixing faucets are used on sinks, bathtubs and laundry tubs. Repairs must be made separately on each faucet unit. Follow the same steps listed above, but remember to turn off the water before beginning work.

6. Every washerless and single-lever faucet model is a little different. When repairs are required, homeowners can purchase a repair kit for their model which includes instructions and the parts that generally will be worn. By replacing all the parts at once, the faucet should function for several years without needing further repair.

Adding New Landscape Or Redesigning The Yard To Conserve Water

When planning to add new landscaping or to redesign existing landscaping, the following suggestions may help you to save 50 percent or more of the water needed to maintain a traditional lawn.

1. If hiring a landscape architect or gardener, select one who is experienced in Xeriscape, the conservation of water and energy through creative landscaping.

2. Design the yard to reduce the grassed areas to only that amount which will actually be used for recreation and entertainment. Front and side yards are most frequently just for show and are logical areas that can be completely or partially converted from lawns to native grasses, ground covers and shrubs.

3. Use native grasses, ground covers, shrubs and trees. Many beautiful varieties of native species can be used in landscaping and are preferable to imported species. The advantage of native species is that, once they are established (usually about 2 years), they do not need to be watered as frequently (about half as often), and they can survive a dry period without any watering.

4. When installing an irrigation system for lawn, shrubs and trees, sprinkler heads for the lawn should be low-angle spray heads that sprinkle the grass without spraying the water high into the air or allowing the water to drift onto the sidewalks and streets. The heads should produce droplets of water instead of a mist. The preferable irrigation system for shrub beds and trees is a drip-type system. There are several varieties, including soaker hoses, bubblers and "leaky pipe." If a sprinkler system is installed for shrubs, an upright pipe extension may be needed if low-angle spray heads are to be used. This is done to spray evenly without obstructions.

5. Shape the soil to protect against erosion and use conditioners to promote water penetration and retention. Shape the soil into earthen basins around all shrubs. If the original soil is rocky, shallow or a heavy clay, improve the soil by adding 2 to 4 inches of organic material or topsoil that is compatible with the soil type.

6. Watering needs vary:
Plants: During summer month, most plants will need about 1 inch of water every 5 to 7 days.
Lawns: The frequency of watering depends on the type of grass.

Landscape Water Conservation
A water conscious landscape design can reduce water use for landscape maintenance by 50 percent or more and also reduce the amount of maintenance required. Of equal importance, the natural beauty and function of the landscape also can be preserved by using adapted plant materials.

1. By using plant materials adapted to specific areas, water needs for landscape maintenance can be reduced by more than 50 percent. Water conscious landscaping involves more than just using adapted plant materials it includes the use of other conservation techniques and practices. Water saving practices include the use of low pressure drip or trickle irrigation systems for watering trees, shrubs, gardens and individual plants or beds; the use of mulches around shrubs, beds and gardens to conserve water; the use of bark, rock or other landscape material in ground cover in areas difficult to water or in areas where plants are not needed; the use of vegetative groundcovers such as ivy, jasmine, liriope and vinca in small, isolated areas, sloping sites that are difficult to water and in heavily shaded sites.

2. Water conscious landscape designs minimize intensively maintained lawn space. Manicured lawn areas may be the focal point of the landscape, but they do not need to cover the entire area unless the lawn is used as a playground or sports field. Highly maintained grass areas generally require more irrigation than any other component of the landscape. On golf courses, for example, only the landing areas need to be intensively maintained. Rough areas may have a more drought tolerant grass, taller mowing heights and a separate water system. Large open areas of the landscape where a grass cover is needed can be planted to low maintenance grasses such as buffalograss, centipede grass or bahiagrass. Native plants and wildflowers also can be allowed to develop in these areas. Such plantings require very little maintenance and no supplemental water once they become established.

3. Proper site preparation will produce a more beautiful landscape and result in more efficient water utilization. Slopes, areas with shallow topsoil, compacted soils and deep sands are difficult sites to establish grass and are inefficient with respect to water use. Modifying or amending the sites before planting is more effective than waiting until problems develop.

4. As the foundation is the strength of a building, the seedbed is the support for a turf. The seedbed refers to the few surface inches of soil that are modified prior to planting. Poor soil conditions result in continuous turf maintenance problems. To prepare a seedbed, first remove all

debris such as large stones, wood or other trash that may sawdust (preferably hardwood), leaf mold or similar material. Thoroughly mix 1 inch of organic matter with the top 3 to 4 inches of soil to produce a uniform seedbed. This mixing can be done by repeated cultivation with a garden tiller or with a tractor and rotovator. When adding un-decomposed organic matter to the soil, also add 3 pounds of ammonium nitrate or 5 pounds of ammonium sulfate per 1,000 square feet to aid decomposition of the organic material. Most soils are deficient in the major nutrients required for turf. Sandy soils normally are deficient in nitrogen, phosphorus, potassium and lime. In the black land areas, nitrogen and phosphorus may not be adequate for good turf development. Potassium in the soil may become deficient for turf growth when high amounts of nitrogen are used in areas not normally deficient in potassium.
If possible, base rates and combinations of fertilizer nutrients on the results of soil tests. In the absence of a soil test, apply a complete fertilizer to the surface of the seedbed. Apply a fertilizer with a 1-2-1 (10-20-10, 6-12-6) or 1 (8-8-8) ratio at a rate to supply 1 pound of phosphorus per 1,000 square feet of lawn. Grade the seedbed to provide surface drainage away from structures, walks and driveways. A fall of 6 inches for every 40 to 50 surface feet is adequate for drainage on sandy soils, provided no pockets or depressions exist. Clay or clay loam soils may require twice that slope to provide adequate surface drainage. In some cases, subsurface drainage systems may be needed to remove excess water from poorly drained sites. If a considerable part of the landscape needs to be filled, use a loam or sandy loam soil. Repeated wetting of the filled site will help settle the soil. The final step in seedbed preparation is raking the surface to remove large clods and stones. At the same time, fill depressions that have developed and level high spots. Walks and driveways should be about 1 inch above the final soil surface.
The site is now ready to be seeded, sprigged or sodded.

5. Conservation and reduced maintenance costs are enhanced by good cultural practices. By some estimates as much as 50 percent of the water used for landscape maintenance is wasted through run-off and evaporation. Proper timing and method of application will reduce much of this water loss. The most important water conserving practice is to water only when grasses show

symptoms of water stress. Grasses wilt and begin to go off color when under moisture stress.
Shrubs and small trees wilt and begin to drop their leaves under moisture stress. Ideally, water
shrubs before the first sign of moisture stress. When water is needed, thoroughly wet the soil 4 to 6
inches deep by applying water slowly or at intervals to avoid run-off. One inch of water, properly
applied, will wet most soils 4 to 6 inches deep. (One inch of water is equivalent to 62 gallons per
100 square feet.) During summer months an inch of water will meet most plant needs for 4 or 5
days. But wait until the plants (or grass) show moisture stress before watering again. Early
morning dew, cooler temperatures or rain may extend the interval between irrigations several days.

6. Mowing is the key to maintaining neat, attractive turf areas. Low maintenance grasses such as
buffalograss require lrecycle plant nutrients. When clippings are picked up, they can be
composted or used for mulch in gardens. During hot, dry conditions raise mowing heights to
reduce water needs. Grass mowed at 2 to 3 inches maintains a deeper root system than grass
mowed at 1 inch. Supplemental water needs are reduced with more effective use of water in the
soil by deep rooted grasses. Mow St. Augustine, bluegrass and tall fescue lawns at 3 inches during
drought conditions. Do not mow bermudagrass and zoysia higher than 2 inches.

7. Thatch, the organic layer between the soil and the green leaves, can slow water movement into
the soil and cause excess run-off. Thatch accumulation results from heavy fertillizing, improper
mowing practices, over watering and frequent pesticide use. Aeration and thatch removal increase
water penetration and reduce run-off. Under some conditions wetting agents (surfactants)
improve water penetration in a heavily thatched lawn. Water movement into the root zone is even
more difficult where compaction develops. Aeration of compacted soils once or twice a year helps
break up the compacted layer and increases water penetration. Aeration also reduces run-off from
sloping sites.

8. In soils containing high levels of sodium salts, gypsum can aid water penetration. Soil test
information available through county Extension agents can reveal the presence of high

levels of sodium. Like the other three factors affecting water use, the quality of the water used can influence the amount of water needed to keep a turf healthy. Where salt is a problem, it is important to thoroughly wet the soil during each application. Light, frequent applications of water high in salts result in an sccumulation of salts near the surface. Thorough watering helps move the salts below the root zone of grasses.

Watering Lawns and Plants During a Drought

1. If water is rationed during a drought, give priority to shrubs that are more expensive and harder to replace than grass and annual plants.

2. During a severe drought when outside watering is prohibited, water plants with "gray water" saved from bathing, dishwashing and clothes washing, if this is permitted by the city or local health department.

Special Considerations for Agricultural Producers

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

Developing a Crop Water Management Plan

Develop a water management system before you are faced with a drought situation.

1. Water Use Efficiency

In areas where water supply is limited or expensive, it is economically important for farmers to attain high water use efficiency as well as high yields. Water use efficiency values can be calculated in several ways and should be clearly defined to avoid misinterpretation. Water use efficiency for a crop and irrigation system can be expressed as crop yield (pounds) per unit of water applied to or actually used by the crop (acre-inches).

2. Rainfall Patterns

Average monthly rainfall data can be misleading because large variations occur. Therefore, percent probability that a certain rainfall amount will occur is a better way of assessing risk. Dryland crops should be grown during periods of high rainfaing widely practiced on drought tolerant crops to take advantage of expected rainfall.

1. Sorghum

Sorghum has good ability to adjust to water stress. Sorghum requires 13 to 24 inches of seasonal water use (evapotranspiration) from precipitation, stored soil moisture and irrigation to achieve

grain yields of 3,000 to 6,700 pounds per acre. Dryland sorghum yields an average of about 1,600 pounds per acre, although yields of up to 3,000 pounds per acre are not uncommon during high rainfall years. Pre-plant irrigation is often not needed and may be inefficiently applied, especially when using conventional graded furrow irrigation systems. The same amount of water may be more efficiently used if applied at later stages of crop growth. Conservation tillage can reduce the need for pre-plant irrigation of sorghum through improved soil moisture storage. Irrigations should be timed to avoid water stress during periods of peak water use (boot, heading and flowering stages) to achieve reasonably good yields and maximum irrigation water use efficiency. Two well-timed seasonal irrigations of 4 inches per application or the equivalent are adequate in normal years for good yields of medium maturity hybrids. Saving irrigation water by withholding a 4-inch irrigation reduces sorghum grain yields by only about 10 percent during the early 6- to 8-leaf stage but by almost 50 percent if withheld at the heading and bloom stage.

2. Corn

Corn is much more sensitive to water stress than sorghum, wheat or cotton. Corn is planted earlier than sorghum and typically allows more efficient use of the May-June wet season than sorghum. The early planting date required for corn increases the need for pre-plant irrigation for stand establishment. The total seasonal water use to achieve any corn grain yield is about 13 inches. Pre-plant irrigation is often necessary. Drought seasons require one or two additional irrigations. Moisture stress caused by low soil water availability or hot, dry conditions during the flowering stage (which includes tasseling, silking and pollination) can severely restrict corn yield. Reduced irrigation of corn has generally resulted in significant yield decreases. Planned water deficits into the stress range are not recommended and may be feasible only on soils with moderate to high water storage and during the early vegetative or grain ripening stages. Reduced acreage, rather than reduced irrigation, offers the best way to adjust corn irrigation to limited water supplies.

3. Wheat

Winter wheat is a major drought-tolerant crop that grows vegetatively during the normal dry period from fall to early spring and develops grain during a period of increasing spring rainfall.

Wheat is normally planted around October 1 and requires available soil moisture from irrigation or precipitation for germination and early growth. Wheat also should receive one late fall irrigation followed by two to three spring irrigations for high grain yields. One additional early irrigation (together with additional applied fertilizer) is usually needed for early planted wheat that is grazed and also managed for grain production. The highest wheat yield response to irrigation, deficits and application. Early fruit set is important in cotton production. However, the production, placement and retention of fruiting sites are sensitive to soil water availability. Under dryland conditions, expected lint yields are in the range of 250 to 300 pounds per acre. Cotton requires more than 13 inches of seasonal water use to produce appreciable lint yields. High levels of water application can decrease lint yield by causing excessive vegetative development and fall immaturity. A pre-plant irrigation of 4 inches is usually advantageous, especially if spring rainfall is not adequate, but heavier pre-plant irrigations are not warranted. Cotton has the ability to overcome moisture stress at most growth stages if water becomes available and low temperatures do not limit growth.
The most critical period for irrigation is early to mid-bloom. If water is available, a second irrigation should be applied at peak to late bloom.

Developing and Improving Vegetative Cover

1. Good cover (standing vegetation and mulch) lessens the impact of rain that dislodges soil particles, and thus reduces the amount of sediment in surface run-off. Good cover also slows the movement of run-off so that more water soaks into the soil and more sediment is deposited on the grazing land rather than being carried into streams or ponds. Vegetative cover also entraps manure and prevents pollution of streams with animal waste.

2. Best management practices for preventing nonpoint source pollution from grazing lands include locating animal holding pens and feeding areas away from streams and other hydrologically sensitive areas, and establishing and maintaining good vegetative cover.

3. The amount and type of vegetation present significantly influence the rate of infiltration of water. Standing vegetation and a mulch or litter layer increase infiltration. Organic matter in the surface soil improves soil aggregation, making it easier for water to move through the soil.

4. Pores in the soil created by plant roots increase the rate at which water can enter the soil by providing pathways for water movement. Long-lived, perennial bunchgrasses have deeper root systems than sodgrasses and allow water to move deeper.

5. The height of grass also affects water movement. Water moves more rapidly across closely grazed grass than grasses left with several inches of stubble.

6. If the watershed has been severely overgrazed, the vegetative cover will need to be improved by controlling undesirable plants such as broadleaf weeds and shrubs and/or seeding desirable plants.

Maintaining Vegetative Cover

1. If at least 10 to 15 percent of the desirable vegetation is present, the most practical and economical way to maintain a desirable vegetative cover is through proper grazing management. The key to proper grazing management is to balance the number of grazing animals with the forage produced. The proper balance will leave a sufficient amount of plant residue to maintain stored food reserves, plant vigor, a healthy root system and seed production of the desired plants. It also allows seedlings to become established.

2. For planning purposes, an appropriate long-term stocking rate may be determined based on the "take half and leave half" rule of thumb. However, a more realistic approach is to manage the grazing stocking rate so that a given amount of residue is left prior to resumption of growth in the spring.

The amount of residue required will vary according to the area of the state and the vegetation types. For example, 300 pounds of plant residue may be adequate for a semi-arid area with short-grass vegetation, while 1,200 pounds of residue may be required in a more humid area with tall-grass vegetation.

3. It also is important to properly distribute animals over the grazing land. Poor distribution may result in extreme overgrazing of one area and little use of another in the same unit. Often these overgrazed areas are located near water, thus

increasing the potential for pollution. Practices which contribute to proper grazing distribution include the development and strategic placement of water sources, construction of fences, strategic location of salt and feeding sites, building of trails, fertilization, prescribed burning and spot seeding.

4. Plants benefit from periods of no grazing. Deferment from grazing is particularly useful on areas where vegetation needs to be improved.

5. Planned grazing systems divide an area into two or more grazing units to allow periods of grazing and rest from grazing in a sequence determined by management objectives, physiological needs of the plants and the design of the system.

Grazing systems may include as few as 2 or as many as 30 or more grazing units.
Some temporary soil compaction may occur with systems that concentrate animals in a small area for short periods of time. However, if the period is short, the soil will recover rapidly from the compaction. A planned grage plants and water quality.

Managing Salinity

Salinity problems normally occur in arid or semi-arid climatic regions. Salinity is a major nonpoint source pollutant in the west as irrigation return flows can carry dissolved salts into waterways. In humid climates, soluble salts are generally eached downward through the soil profile where they cannot cause problems.

In general, accumulation of salt results from water evaporation at the soil surface. This condition can render land vegetatively nonproductive, and may lead to nonpoint source pollution through erosion and sedimentation. Further, the salt concentration may run off during a storm and affect adjacent lands. These problems normally occur where either surface seep areas appear or where a high water table exists in the soil profile. Sometimes rainfall moves through the ground to the water table or to a barrier above the

water table. Here it accumulates and moves laterally, often parallel with the land slope, toward an outlet or low point in the landscape. It then forms a wet weather or saline seep. During the summer or periods of low rainfall, such seepage spots may completely dry out. Only detailed analyses of borings, soils and surveys can establish the source and amount of groundwater contributing to seep areas.

1. Irrigated land in arid areas sometimes must be drained to prevent or reduce salinity problems. Topographic surveys and subsurface investigations should be made to obtain information on the soils, geology and water table elevations. These data are the basis for determining the extent of the problem and for setting design parameters.

2. Plant nutrients and pesticides should be applied in such a manner as to limit the potential for contamination of surface and groundwater supplies by outflow from drainage systems.

3. One alternative treatment is to establish permanent salt tolerant species such as bermudagrass, aikali sacaton, gramas and kleingrass. Salt tolerant species will allow a vegetative cover where bare ground would otherwise lead to water quality problems.

4. Cropping with salt tolerant, seasonal species such as cotton or small grains assists in addressing the problem of saline soils. Planting high water use crops such as alfalfa, four-wing saltbush or trees above a seep area helps control the amount of moisture that accumulates.

5. Organic or inorganic additives to the soil surface will increase water infiltration. This will allow water to force dissolved salts below the root zones and prevent further concentration of salts on the soil surface. Organic amendments include cotton burs and gin "trash" that may be obtained from cotton processing facilities. Inorganic agents to increase soil tilth include gypsum or calcium sulfate.

6. Land alterations are sometimes used to alleviate salinity problems. Such

constructed systems have a place in salinity control, but use caution when implementing them. In some cases, altering the land surface by smoothing or grading may eliminate the effects of the problem by confining the seep area or providing natural surface drainage. Practices such as closed-end terraces or basin terraces which impound water can be used on areas with minimal seepage, but should be scrutinized where they might contribute to problems associated with salinity of the site.

7. A surface drainage system may be the least expensive alternative, but potential maintenance problems and obstructions to farming operations should be considered. Maintaining water quality of any discharge waters is of utmost importance. Most subsurface drainage uses corrugated plastic tubing installed with a synthetic filter envelope. Again, as with any other drainage system, an adequate outlet is imperative, especially considering the discharge water quality in comparison to receiving waters.

8. Irrigation water management is important on saline soils. Salt accumulates in soils because of salts in irrigation water or the presence of a high water table. To prevent harmful accumulation of salts in soils irrigated with saline water, an additional quantity of water, above that required for the crop, must be passed through the root zone to leach salt from the soil. A high water table contributes to salt accumulation because capillary action causes water and soluble salts to rise to the soil surface. There the water evaporates, leaving behind salt deposits. Enough water must be applied periodically to leach out accumulated salts without excessive waste of water. If a seep area could be made worse by applying liquid agricultural waste, proper management must be used, including nutrient management.

Earthquakes

The crust of the earth is made up of seven masses called tectonic plates. They are in steady motion. Accumulated stress builds up from the continental plates grinding, sliding or colliding against or slipping under each other. Pressure is released in a powerful explosion of energy that fractures the earth's surface, shakes the

ground, causes the ground to roll, liquefies some soil and generates giant water waves.

When an earthquake will unleash its force remains unpredictable. Preliminary cracks may send off foreshocks before a main fracture. These foreshocks can occur months or minutes before the rapid onset of the earthquake. An earthquake lasts for seconds or minutes, while aftershocks may occur for months after the main earthquake.

Powerful and widespread ruptures or shaking ground can cause buildings to move off their foundations or collapse; damage utility lines, other structures and roads; set off fires; and threaten the lives of people and animals. It is the damage to structures that presents the greatest risks to life and property.

Earthquakes create a trigger for other natural hazards such as landslides, tsunamis, avalanches, fires and flash floods.

The greatest likelihood of major earthquakes is in the western United States, particularly along the San Andreas Fault in California and up the Alaskan Coast, in the New Madrid Fault Zone in the Midwest, and in a few pockets on the East Coast, particularly in South Carolina and New England. There is no seasonal or yearly cycle of occurrence. Earthquakes can happen at any time. Major earthquakes appear to occur in cycles of between 50 and 275 years.

How Earthquakes are measured in intensity of ground vibrations, the elasticity of buildings and tructures, and how well structures are connected to their foundation, falling or collapsing objects and structures accompany earthquakes. Structural instability, such as dam failures, can trigger flash floods. Fires have been the greatest cause of damage in the past. Offshore earthquakes may cause tsunamis.

Preparing for an Earthquake

In addition to precautions outlined in the sections on General Family Preparedness, Residential Fires and Hazardous Material Accidents, you need to take the following steps.

1. Become familiar with earthquake terms.

Aftershocks: Tremors that occur in the hours or days after the initial earthquake shaking is over.

Epicenter: The place on the surface of the earth directly above an earthquake's first movement (focus).

Fault: A fracture in the earth's crust along which rocks have been displaced.

Focus: The point beneath the surface of the earth where the rocks first break and move, beginning the earthquake.

Intensity: An indication of an earthquake's apparent severity at a specific location, based on its effects on people and structures.

Magnitude: Size of an earthquake determined from the size of the seismic waves it generates as recorded by seismographs.

Mercalli Scale: The scale used to measure the strength of an earthquake as determined by people's eyewitness observations.

Tidal wave: This is a misnomer for a tsunami. Tidal waves occur from the interaction of the moon and large bodies of water. Waves you see rolling into the ocean shore every day are tidal waves. Tsunami: A seismic sea wave. An unusually large wave (or series of them) produced by an undersea earthquake or volcanic eruption.

2. Safeguard your home by:

Bolting bookshelves, water heaters and cabinets to wall studs.

Anchoring things so that they will not move or fall during an earthquake is the most important thing you can do to make yourself safe. Keeping things in place also means they will not break.

3. There are many ways to make the contents of your home and workplace less hazardous. Move cabinets and tall furniture so that if they fall they are not likely to hit people.

Use steel angle brackets to anchor them to studs in the wall. Put heavy or breakable things on bottom shelves. You can even put "fences" or restraining wires to keep items from falling off open shelves.

Put child-proof or swing-hook latches on bathroom and kitchen cabinets. At work, put strong latches on cabinets where hazardous items are stored.

Use screw-eyes or tongue-in-groove hangers to mount mirrors or pictures instead of hanging them on nails.

Preparing for an Earthquake

Be sure that ceiling fans and light fixtures are well anchored or have earthquake safety wiring.

Anchor typewriters, computers, televisions, stereos and like items with heavy duty Velcro, at home and at work.

Strap your water heater to anchor it to wall studs. You can buy metal strapping, called plumber's tape or strap iron, in hardware stores. Use it to strap the heater at the top and bottom. This not only preserves your best source of water but also significantly reduces the fire hazard in your home by preventing a broken gas line.

Do not assume that anything is too heavy to move in an earthquake. When the ground is going up and many injuries occur when people act on their impulse to run. Train yourself to take cover where you are.

Responses Inside Buildings During an Earthquake

For most of us the biggest danger in an earthquake is not from a building collapsing, but from things inside the building falling or flying around while the building is shaking.

Hazards found inside buildings include overhead lights, ceiling tiles, cabinets, windows, furniture and equipment.

If an earthquake happens, the best thing to do is:

1. Drop, cover, and hold on. Get under a table. If there are no tables, get under or down between rows of chairs or against inner walls.

2. Do not stand in a doorway. Buildings today have so much partitioning, much of which is temporary, that many doorways are actually weak points. Doorways are not a good solution in a group situation either.

3. If you have nothing to get under, sit down against an interior wall or next to a chair, holding on if possible.

4. If you are in bed, it's best to stay there, hold on, and pull the pillows over your head for protection.

5. If children are in another room, take cover in the closest safe place and call to them to do the same. Children will need you alive and unhurt after the earthquake. Avoid the urge to run to protect your children, as that puts you in more danger of being hurt or injured.

Responses if You are Outside During an Earthquake

1. Outside, get away from buildings, walls, trees and power lines. If you cannot get clear of hazards, getting back inside a building is better than staying on the sidewalk. Sidewalks next to buildings are among the worst places to be.

2. In a car, ease off the accelerator and slow down carefully. Do not stop on or under overpasses and bridges if you can avoid them. Be aware of what traffic around you is doing and act accordingly.

3. If you live in coastal areas, be aware of possible tsunamis.

After an Earthquake

1. Take basic precautions immediately after an earthquake. In addition to those outlined in the General Family Preparedness, Residential Fires and Hazardous Materials Accidents sections you should:

Expect aftershocks. Avoid using vehicles except in emergencies.

2. Check yourself for injuries and protect yourself by putting on shoes, work gloves and any other protective gear at hand.

3. If the electricity is off, turn on a flashlight.

4. Once you are sure that you're all right, check the people around you for injuries.

You might ask loudly, "Is everyone okay?" This will also help calm people. The types of injuries that happen most often in an earthquake include cuts, bruises, fractures and physiological shock.

5. Check the entire building for structural damage and chemical spills. Refer to the section on Hazardous Materials Accidents for further response information. Check chimneys for cracks and damage. The initial check should be made from a distance. Have a professional inspect the chimney for internal damage that could lead to fire.

6. Right after an earthquake, hang up your phone. If the receivers are shaken off the hooks, these lines register as "open" in the system and it overloads. You can help restore telephone service by hanging up your phone.

Special Considerations for Agricultural Producers

In addition to animals right after an earthquake. Aftershocks are quite frequent after large earthquakes, and further increase the fear and skittish reactions of animals.

3. The best thing to do for animals after an earthquake is to get them out in the open, to open pasture or rangeland. Let the animals run free. Do not attempt to rope or chain large animals such as cows and horses because they may injure or kill themselves if an aftershock occurs and they try to run.

4. Get animals out of barns or buildings that may have been damaged in an earthquake. Barns are especially susceptible to earthquake damage. Large beams and rafters may not be well secured, thus making the barn subject to collapse during aftershocks.

Hay bales and large equipment may be tossed around and come tumbling down on animals and people inside barns.

Immediately open the doors and let the animals out. It's easier to recover a live animal than replace a dead one.

5. Ensure that mechanical equipment has not been turned over or damaged. If there is danger of electrical shock, turn off the main electrical circuit breaker or fuse. If you smell gas or suspect a gas leak, turn off the main valve.

6. Check fence lines and posts. You may need to build a make-shift yard from temporary posts and fencing. Then repair/rebuild the regular fencing, and open the temporary yard when completed.

7. If animal carcasses need to be disposed of refer to the General Family Preparedness, Special Post-Disaster Considerations section for appropriate handling.

Residential Fires

Fire safety and prevention are important for everyday emergencies, but they are crucial during disasters. More than 6,000 Americans die and 100,000 more are injured by fires each year. Fire spreads quickly. A fire's heat is more dangerous than the flames; inhaling super hot air can sear your lungs. Fires produce poisonous gases that make you drowsy and disoriented. In addition to those measures outlined in the General Family Preparedness section, the following fire specific measures should be followed.

Fire Safety and Prevention

1. Install smoke detectors in your house or apartment. Place detectors on every level of your house: outside bedrooms at the top of open stairways or the bottom of enclosed stairs - near (but not in) the kitchen. Clean smoke detectors regularly and replace batteries once a year.

2. Plan escape routes with your family. See the General Family Preparedness section of the Handbook.

3. Clean out storage areas. Don't let trash accumulate.

4. Check electrical wiring. Inspect extension cords for frayed or exposed wires or loose plugs. Do not overload extension cords or outlets.

5. Never use gasoline, benzine, naptha or similar liquids indoors. Never smoke near

these flammable liquids. Safely discard all rags or materials soaked in flammable material after use.

6. Check heating sources. Make sure they are clean and in working order.

7. Alternative heating sources such as wood, coal and kerosene should be used carefully.

8. Make sure that home insulation is not in contact with electrical wiring.

9. Know where your gas meter and central electrical panels are so you can shut them off in an emergency. If you shut off your gas line, allow only a gas company representative to turn it on again to make sure it is done properly.

10. Ask your local fire department to inspect your house for fire safety and prevention.

11. If you live in wildland areas, your house could be a target for wildfire. Call local authorities and get information about wildfires in your area. Do not install an untreated wood shake roof. Make your landscape fire safe by removing excess brush and undergrowth, planting fire resistant plants, and pruning trees of low branches.

What to Do in Case of a Fire

1. To put out a small fire, take away its air or fuel, or cool it with water or fire extinguishing chemicals.

2. Never use water on an electrical fire. Use only a fire extinguisher.

3. Oil and grease fires occur primarily in the kitchen. Smother the flames with baking soda or salt or put a lid over the flame if it is burning in a pan.

4. Small fires can be controlled with water or fire extinguishers, but do not try to put out a fire which is getting out of control.

5. If your clothes catch on fire, stop, drop and roll until the fire is extinguished. Running only makes the fire burn faster.

6. Sleep with your door closed. If you wake up to the sound of a smoke detector, feel the door before you open it. If the door is cool, leave immediately. Be prepared to bend low or crawl. Smoke and heat rise, and the air is cooler near the floor. If the door is hot, escape through a window.

After

1. Ask your insurance agent about estimates and loss coverage.

2. Do not enter a fire-damaged building unless authorities have given you permission.

3. When entering a building, be watchful for signs of heat or smoke because they may be signs of smoldering remains of fire.

4. Have an electrician check your household wiring before the current is turned back on. Do not attempt to reconnect any utilities yourself.

5. Beware of structural damage. Roofs and floors may be weakened and need repair.

6. Discard food, beverages and medicines that have been exposed to heat, smoke or soot.

7. If you have a safe or strong box, do not try to open it. A safe or fire proof box can hold intense heat for several hours. If the door is opened before the box is cooled, the entering air combined with the high internal temperature may cause the contents to burst into flames. Refer also to the General Family Preparedness section.

Floods

Floods are the most common and widespread of all natural hazards.

Some floods develop over a period of days, but flash floods can result in raging waters in just a few minutes. Even very small creeks, gullies, culverts, dry streambeds or low-lying ground that may appear harmless in dry weather can flood. Wherever you live, be aware of potential flooding hazards. If you live in a low-lying area, near water or downstream from a dam, you must be prepared for floods. In addition to the information provided here, also refer to the General Family Preparedness section.

Preparing for Floods and Flash Floods

Some simple advance preparation will help you be ready for possible floods in your area.

1. Know the flood warning system in your community and be sure your family knows the warning. Instruct family members in emergency procedures during a flood warning.

If you live in an area subject to frequent or sudden floods, especially flash floods, you may wish to have family flood drills. Assign each family member an emergency task such as gathering emergency supplies, turning off utilities, or listening to the radio for instructions.

2. Flood proof your buildings. Install check valves in sewer traps to prevent water from backing up in sewer drains. Seal cracks in walls and floors with hydraulic cement.

Watch for these these fire hazards on your property:

- Broken or leaking gas lines
- flooded electrical circuits,
- submerged furnaces or electrical appliances
- flammable or explosive materials coming from upstream.

5. Before floodwaters crest, turn off the main power switch if you think the electrical circuits are going to be under water. Never Touch The Switch While You Are Wet Or Standing In Water. Do not turn the electrical system back on until it has been inspected by an electrician.

6. Know what a river height forecast means for your property especially how far your property is above or below expected flood levels.

7. Know where to go in case of flooding. Remember that you must seek higher ground as quickly as possible, on foot if necessary.

8. If you are camping, know how far your campsite is above nearby waterways. Know how to seek higher ground. Stay out of unknown water paths such as dry creeks or river beds. If advised to leave the area, do so immediately.

9. Refer to the General Family Preparedness section of this Handbook for additional steps to take.

Building Dikes To Prevent Minor Surface Flooding

Standing water from melting snow or heavy rains can flood basements and damage yards, wells, feed supplies, machinery and other property. Flooding is more apt to occur in areas with poor surface drainage systems or ice dams.

A 1- to 3-foot high sandbag earth dike offers protection from shallow flooding (water depth less than 3 feet). Contact a construction firm, lumber yard or Civil Defense officials for information on where to buy sandbags in the area.

A sandbag dike can be constructed as follows:

1. Select the site for the dike, making the best use of natural land features to keep it as short and low as possible. Avoid trees or other obstructions which would weaken the structure. Do not build the dike against a basement wall. Leave about 8 feet of space to maneuver between the dike and buildings.

2. Remove ice and snow (down to the bare ground if possible) from a strip of land about 8 feet wide.

3. Fill and lap sandbags. Fill bags approximately half full of clay, silt or sand. Do not tie. Alternate direction of bags with bottom layer lengthwise of dike. Lap unfilled portion under next bag. Tamp thoroughly in place. Build the dike three times as wide as it is high.

Dike Construction Continued

4. Seal the finished dike to increase its watertightness. To seal the dike: Spread a layer of earth or sand 1 inch deep and about 1 foot wide along the bottom of the dike on the water side. Lay polyethylene plastic sheeting so that the bottom edge extends 1 foot beyond the bottom edge of

the dike over the loose dirt. The upper edge should extend over the top of the dike. (This plastic sheeting, available from construction supply firms, comes in 100-foot rolls and is 8 or 10 feet wide.) Lay the plastic sheeting down very loosely so that the pressure of the water will make the plastic conform easily with the sandbag surface. If the plastic is stretched too tightly, the water force can puncture it. Place a row of tightly fitting sandbags on the bottom edge of the plastic to form a watertight seal along the water side. Place sandbags at about 6-foot intervals to hold damp or flooded basements. Leaks in basements may be caused by cracked walls, improper grading, water in window wells or water pressure under floors.

Cracks

Watertight concrete is important to prevent water seepage in the basement. Fill cracks when the soil is dry, so cracks will be dry. It is best to fill cracks when there is no artificial heat in the basement so thin layers of mortar can cure.

1. Wide cracks (« inch or more). Shape the crack like a V with a star drill or cold chisel. Fill with mortar. Chisel out the sides of the crack to make a V opening about 1 inch deep and 1 inch wide at the surface. Coat the crack with a creamy mixture of cement and water. With a trowel immediately fill the opening with a 1:2 mixture of cement and sand mortar (one amount of cement to two amounts of sand mortar). Or use a chemically treated cement available at hardware or building supply stores.

2. Hairline cracks. Fill the cracks with a cement base paint. With a scrub brush apply a cement wash of Portland cement and water. Or check for other leak-stopping materials at your local lumberyard or hardware store.

3. The ground around foundations should slope away from the house at a rate of at least 6 inches in 10 feet. You should regrade by cutting and filling if you notice water standing along foundations, or if the surrounding ground is flat or slopes

toward the house.

4. Carry roof water away from the building by eave gutters and downspouts. Water from downspouts should be carried about 3 feet away from the foundation wall. Use a splash block, downspouting or tile drain. Do not direct water from the downspouting into the drain around the footing.

Preventing Leaks in Basements

Window Wells

1. Check window wells to be sure that surrounding ground ends a few inches below the top of the well.

2. To prevent water seeping down the outer surface and under the well, compact several inches of dirt around the well.

3. If there is tile around basement footing, dig a post hole inside the well to this tile. Fill with clean gravel.

4. If there is no tile around footing, improve drainage by laying drain tile from the bottom of the window well to a lower point in the yard.

Basement Floors

Water pressure under concrete basement floors may cause them to leak or buckle.

To relieve this pressure:

1. Build a sump so water can run into it and be pumped out.

2. If there is a layer of clean gravel under the floor, drill a hole in the side of a floor drain. This will allow water to flow through the gravel to the drain, and will relieve the pressure under the floor.

3. Leaks sometimes can be diverted through concrete lined channels below or above floor level. Make a channel by chipping away floor and smoothing it with mortar, or by building a ditch above floor level. Carry the channel around the wall to a floor drain.

Cleaning Up After a Flood Setting Priorities

Priorities will vary with the kind and seriousness of damage.
Buildings may not be habitable during repair.

1. Examine building structure. Check foundations for settling, cracking or undermining. Examine walls, floors, doors and windows to determine what repairs are necessary. You may want to repair only temporarily until extensive work can be done.

2. If basement is flooded, start pumping the water and water system.

5. Shovel out mud and silt before it dries.

6. Before they dry, wash down flooded walls and floors with a hose. Start at upper limit of flooding and work downward.

7. Scrub and disinfect walls and floors.

8. Start the heating system if possible to speed up drying. Before operating it, the heating system may need to be cleaned, dried and reconditioned. Make sure chimneys are clean before starting system.

9. Dry out walls and floors. If necessary for proper drying, strip walls open up to water level. Drill holes in exterior siding. Complete drying may take months.

10. Repair buckled walls and floors.

11. Clean and dry household items, furniture, carpets, clothing, dishes and bedding. Disinfect when necessary.

12. Treat items for mildew as needed.

13. Care for damaged trees, shrubs and lawn.

14. Repaint, repair, refinish as necessary.

Salvaging Sewing Machines and Sergers

Most damage to flooded sewing machines and sergers is caused by rust.
Even if the machine was not submerged, check for rust caused by general dampness.
Rust develops quickly on highly polished, machined or plated surfaces.

1. If the equipment was submerged, the machine (head and controls) or the serger should be serviced by a dealer or professional sewing machine/serger repair person within 10 days if possible.

2. Try to prevent as much damage as possible by drying equipment quickly. Use a hand-held hair dryer to help dry interior parts. Dry attachments with a soft cloth or a hair dryer. Rinse attachments and removable metal parts in dry cleaning solvent or a light machine oil. Oil replaces water and protects the metal.

3. Oil interior parts to protect them. Put a few drops of machine oil on each moving part and operate the sewing machine or serger by hand for several minutes to distribute oil. If the equipment has been submerged, do not use the motor and controls to operate the equipment until they have been inspected by a dealer or a repair person.

4. If the sewing machine, serger or attachments have already begun to rust, follow preventive measures as above. Then rub rusted parts with very fine steel wool and reapply a coating of oil.

5. If the equipment cannot be serviced within 2 weeks, be sure a light film of oil remains on the parts. Store equipment in a large plastic bag until serviced to protect other surfaces from leaking oil. Place a chemical dehumidifier in the bag with the machine to absorb any residual moisture.

6. If equipment and controls were not submerged, professional servicing may not be necessary. Follow rust prevention measures for metal parts and then operate the equipment with the motor. If the equipment works properly, remove excess oil from attachments and other removable parts with a soft cloth. To remove excess oil from interior metal parts and thread-handling mechanisms sew/serge through scrap fabrics until no more oil is absorbed into fabric.

Cleaning Flood-soiled Pillows and Mattresses

Mattresses

1. A good innerspring mattress should be sent to a commercial renovating company.

Renovation is too difficult to do at home. Ask about the cost of the work.

It may be less expensive to buy a good reconditioned or new mattress.

2. If a mattress must be used temporarily, scrape off surface dirt and expose mattress to sunlight to dry as much as possible. Cover mattress with a rubber or plastic sheet or mattress cover before using it.

3. If you decide to keep a flood-soiled mattress, it should be sterilized. This must be done at a sterilizing plant such as a mattress company or a state hospital.

Ask your local public health department or county Extension agent for information on mattress sterilizing plants in your area. Have mattresses as dry as possible before taking them to a sterilizing plant. Use crop drying fans or household fans to speed up the drying process.

Feather Pillows

1. For feather pillows, if ticking is in good condition and does not contain red or yellow stains, wash feather and ticking together. Brush off surface dirt.

Wash in machine or by hand in warm (not hot) suds 15 to 20 minutes. Use a disinfectant, following product directions for use. If using an automatic washer, wash no more than two pillows at one time. If washing by hand, rinse at least three times in clear warm water. Spin off water or squeeze out as much water as possible. Do not put pillows through a wringer. Dry in an automatic dryer at moderate heat setting. Put several bath towels in the dryer with the pillow to speed up drying. Allow about 2 hours. Or dry pillows in a warm room on a sweater drying rack with a fan on them. Shake and turn pillows occasionally to fluff feathers and hasten drying. Or hang pillows on a clothesline by two corners.

Change position end to end and shake occasionally to fluff feathers and speed drying.

2. If ticking is not in good condition or is stained with red or yellow mud, wash feathers and ticking separately. Find or make a bag of light weight, firmly woven fabric such as muslin. The bag should be two to three times larger than the ticking. Open one edge of the ticking.

Radiological Accidents

Radiation is energy in the form of waves or particles and is part of our everyday lives. Our planet receives radiation from outer space and from the sun. Other naturally occurring radioactive materials are present in the soil, in the structures where we live, and in the food and water we consume. These natural forms of radiation are referred to as "background radiation." Radioactive materials also are a source of fuel for nuclear power plants. While the history of such plants in the United States has been generally safe, residents living near power plants should know what preparations and responses are appropriate to take in the event of a radiological accident. In addition to the information in this section, also refer to the General Family Preparedness section.

Radiation Types

The three basic forms of radiation are:

1. Alpha particles can be stopped by a single sheet of paper or a few layers of dead skin. Therefore, alpha radiation is not an external hazard. However, if the source of radiation is within the body, it is the most serious hazard, because of alpha radiation's greater biological effects on live tissue.

2. Beta particles can be stopped by a few layers of clothing, 10 feet of air or a half-inch of tissue. If beta particles are retained in the skin, they can damage living cells by causing severe skin or eye burns. They also can damage cells in the digestive tract if particles are ingested with food or water.

3. Gamma rays are similar to x-rays and are the major radiation of concern in radiological environments. Gamma rays are deeply penetrating and can damage

body cells. Although all cells are subject to damage, bone marrow cells and cells in the intestinal lining seem to be particularly sensitive. Gamma rays can be shielded to acceptable levels by sufficient amounts of materials.

Radioactive materials can be released in the form of particles or gases. Both are spread by the wind. The farther the particles travel, the lower the concentration of radioactive material. Contamination is an undesired presence of radioactive materials.

In an accident that releases radiation into the environment, people, farm equipment, animals, crops and the soil can become contaminated. In addition to the following procedures, homeowners and agricultural producers also should refer to the section on General Family Preparedness.

Preparing for a Nuclear Power Plant Accident

1. If you live near a power plant, familiarize yourself with the terms used to describe a nuclear emergency. Notification of unusual event means a small problem has occurred at the plant. No radiation leak is expected. No action is necessary on your part. An Alert means a small problem has occurred and small amounts of radiation could leak inside the plant. You should not have to do anything.

A site area emergency is a more serious problem. Small amounts of radiation could leak from the plant. Area sirens may be sounded. Listen to your radio or television for safety information. A general emergency is the most serious problem. Radiation could leak outside the plant and off the plant site. The sirens will sound. Tune to your local radio or televistall sirens and other warning systems to cover a ten-mile area around the plant.

3. Obtain public emergency information materials from the company that operates your local nuclear power plant or from your local emergency services office.

What to Do in a Nuclear Power Plant Emergency

1. Keep calm. Not all incidents result in the release of radiation.

2. Stay tuned to local radio or television. Specific instructions will be given by authorities. Local instructions should take precedence over any advice given in this handbook.

3. Evacuate if you are advised to do so. See the section on Evacuation Procedures in the General Family Preparedness section. Keep car windows and vents closed; use reecirculated air.

4. If you are not advised to evacuate, remain indoors. Close doors and windows. Turn off the air conditioner, ventilation fans, furnace and other air intakes. Go to a basement or other underground area if possible. If you must go outdoors, cover your nose and mouth with a handkerchief.

5. Do not use the telephone unless absolutely necessary. All lines will be needed for emergency calls.

6. If you have just been outdoors, take a thorough shower. Change your clothes and shoes. Put the items you were wearing in a plastic bag. Seal the bag and store it out of the way. Clothes can later be washed as you normally would in the washing machine. Any contamination would remain in the water and not contaminate the washing machine.

7. Put food in covered containers or in the refrigerator. Food not previously in covered containers should be washed first.

Safety of Home Gardens After a Nuclear Accident

1. Test homegrown produce for radioactive contamination before it is consumed.

2. If you work outside make sure you: Wash hands thoroughly before eating. Wear protective clothing that covers all portions of your body while outside. Remove outer clothing before you go inside. Wear a dust mask or a folded, damp cloth over your nose and mouth while you work. Avoid dust-producing activities as much as possible.

Recovering Losses and Expenses from a Nuclear Accident

1. Nuclear power station operators are required to have insurance to cover damages suffered by the public. Additional living expenses, loss of farm or business income, and physical or property damage are covered.

2. The Federal Emergency Management Agency also may provide funds for temporary housing and home repair, as well as other types of assistance. See the section on General Family Preparedness for post-disaster assistance information.

Special Considerations for Agricultural Producers

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

What to Do in a Nuclear Power Plant Emergency

1. Shelter livestock and give them stored feed if advised to do so by authorities.
   Some farm buildings provide better protection than others because of heavy construction.
   Placing earth, hay, sacked feed or fertilizer, concrete blocks or other materials around exposed shelter walls will increase shielding effectiveness. Make sure that adequate ventilation and wood lots offer some protection. Cattle could be penned in cattle underpasses or bridges if available. Cattle confined in pens shelter each other to a limited extent. Move dairy cattle And goats indoors first because radioactive material easily transfers to milk.

2. Do not add water to covered storage unless it is from a protected source.

3. Protect standing water by covering the surface at the outset of an emergency.

4. Cover feed to protect it from falling particles. Protect haystacks in an open field with tarpaulins, plastic sheets or similar coverings.

5. Poultry are somewhat more resistant to radiation than other farm animals.
   Confined shelters and use of stored feed also lower concern of contamination.
   The same feed, water and shelter ventilation measures taken for livestock should be followed to reduce the likelihood of contaminated egg and poultry products.

6. Swine care should follow the steps taken with other livestock. Water is a primary necessity for hogs, so sure the source is protected.

Animal Care After a Nuclear Accident

1. Limit the use of feeds to those under cover or protected from contamination. Grain in permanent indoor storage, hay in a barn and silage in a covered silo may be considered protected. Rolled bales of hay should be used only when absolutely necessary, and only if the outer layers are removed and discarded.

Do not let animals graze until you are notified that forage in your area is safe. If grazing cannot be avoided, supplementing it with protected feed will limit ingested contamination. If no stored feed is available, animals can survive on water for a period. Make a special effort to prevent dairy animals from becoming contaminated by providing clean food and water.

If possible, prevent cattle from drinking from ponds, lakes, rivers and streams.

Spring and well water should be free of contamination.

2. If you have been evacuated and your absence is longer than the protected feed sources will last, emergency officials may allow you to reenter the area. You must conform to rules regarding emergency workers, including the use of protective equipment and instrumentation and limitation of stay.

3. It is unlikely that even a worst case event would cause the death of any animals. Any unexplained illness or death would more likely be the result of changes in routines of livestock feeding and patterns of grazing. In the event of death or illness of an animal contact your State Department of Agriculture or County Extension agent immediately to assist in diagnosis of the problem.

4. Soap and water will remove contamination from animal hides.

5. Wear protective clothing similar to that used in pesticide application.

Recovering Exposed Fruits, Vegetables and Soils

1. Fruit and vegetables may be externally contaminated by radioactive particles.
Normal washing of leaves, pods and fruits that are surface contaminated is effective in removing contamination. Washing should be done in a place other than the kitchen to prevent contamination of foods and dishes.

2. Underground crops absorb little radiation. Standard removal and disposal may be necessary. Planting alternative crops such as cotton or flax instead of food crops may be recommended in some situations. Deep plowing will remove radioactive substances below the plant root level and prevent plants from taking up contaminated substances.

Monitoring Fish and Marine Life

1. Fish and marine life in ponds may be harvested unless officials determine they are contaminated.

2. Samples of water, fish and marine life from open bodies of fresh and saltwater should be analyzed for contamination.

Marketing Animals and Products

1. A buffer zone, called a Food Control Area, will be established around land which may be contaminated.

2. State emergency officials will monitor milk on farms and at points on its way to market. You will be notified if sampled milk contains radioactive materials.
Milk should be safe if it is from dairy animals that have been adequately sheltered and protected. There may be delays in milk pickups which will require holding milk for longer periods of time. Be prepared to provide alternate storage or some milk may have to be discarded.

3. Do not destroy animal foods unless storage has made them inedible.

4. Livestock that have been exposed to external contamination can be used for food if they have been washed well and monitored by authorities prior to slaughter.
Meat animals that have internal contamination cannot be slaughtered until officials

advise that it is safe to do so.

Tornadoes

Tornadoes are nature's most violent storms and can leave an area devastated in seconds. A tornado appears as a rotating, funnel shaped cloud, striking the ground with whirling winds of up to 200 miles per hour or more. A tornado spins like a top and may sound like a train or an airplane.

Although tornadoes usually travel for up to 10 miles before they subside, 200-mile "tornado tracks" have been reported. Tornadoes can strike any time of the year and often accompany hurricanes. In addition to those measures listed in the General Family Preparedness section, also use the following tornado preparedness and response measures.

How to Prepare for a Tornado

1. Know the tornado season for your area.

2. Learn to recognize severe weather signs. Tornado weather is usually hot and humid with southerly winds.

3. Know what a tornado looks and sounds like.

4. Know what a tornado watch or warning is:
   A Tornado Watch indicates that weather conditions may cause tornadoes or severe thunderstorms to develop in or near the watch area. A watch does not mean a tornado has been sighted. A Tornado Warning means that a tornado has actually been sighted or indicated by radar and residents should take shelter.

Special Precautions for Mobile Home Dwellers

1. When you purchase a mobile home, look for built-in safety features: Factory installed anchoring strapscate your home so the small end is directed into the direction of prevailing winds, reducing surface exposure to wind impact.

2. Encourage your neighbors to tie down, too. An unanchored mobile home blown into your home can cause extensive damage.

3. Have your mobile home blocked properly. Open concrete blocks are less expensive but are never good enough.

4. Make sure you purchase approved tie-downs.

5. Skirting your mobile home will help protect underneath the home from moisture and winter weather, as well as reduce soil heaving caused by soil thawing and freezing during winter months. Soil heaving destabilizes the mobile home, requiring retightening of the tie-downs.

6. Be aware of where designated tornado facilities or shelters are.

What to Do During a Tornado Warning

1. When a tornado has been sighted, stay away from windows, doors and outside walls. Protect your head from falling objects or flying debris. Take cover wherever you are. In a house or small building, go to the storm cellar or basement. If there is no basement, go to an interior part of the structure on the lowest level (closets, interior hallways). In either case, get under something sturdy (such as a heavy table) and stay there until the danger has passed. In a school, nursing home, hospital, factory or shopping center, go to a designated shelter area. Stay away from windows and open spaces. In a vehicle, trailer or mobile home, get out immediately and go to a more substantial structure. If there is no shelter nearby, lie flat in the nearest ditch, ravine or culvert with your hands shielding your head.

2. Do not attempt to flee from a tornado in a car or other vehicle.

Responses After a Tornado

1. Use great caution when entering a building damaged by high winds. Be sure that walls, ceiling and roof are in place and that the structure rests firmly on the foundation.

2. Look out for broken glass and downed power lines.

Inspecting Buildings for Hidden Wind Damage

1. Check the roof for:

Missing or damaged shingles. Loose nails on metal roofing. If nails don't hold when hammered back in, use #12 or #14 metal screws to fill old nail holes. Potential leaks that could indicate structural separation. This is more easily checked for on sunny days.

2. Inspect the foundation to make sure that joints where the foundation and wall meet haven't separated. On stone or concrete foundations, check to see that plate bolts have not worked loose.

3. Inspect the interior of buildings for structural damage. Using a good light, check the framing. Look for ridge separation, loose knee braces and loose rafters where the rafters join the walls.

Special Considerations for Agricultural Producers

In addition to those tornado concerns listed previously, agricultural producers should inspect silos for hidden wind damage. Make sure the silo is still plumb. Look for loose hoops. Inspect the base of metal silos inside and out for hairline cracks. Remove any rust around the base with a wire brush. Look for new cracks in the plaster of empty concrete stave silos.

Volcanic Eruptions

Volcanic ash can be harsh, acid, gritty, glassy and smelly. While not immediately dangerous to most adults, the combination of acidic gas and ash which may be present within miles of the eruption can cause lung damage to small infants, very old people or those suffering from severe respiratory illnesses.

Preparing for a Volcanic Eruption

1. Follow the information located in the General Family Preparedness section of the Handbook.

2. Be familiar with terms associated with a volcanic eruption. Volcanic ash usually is erupted into the air above the volcano and then is carried downward along with volcanic gases. Pieces of ash may range from dust sized particles to pieces of rock. Ash can overload roofs, corrode metals, cause fabrics to decompose, clog

machinery, block drains and water intakes and injure or kill vegetation.

Lava flows are streams of molten rock from a vent or from a lava fountain.

Volcanic gases associated with active volcanoes are water vapor, carbon dioxide, hydrogen sulfide, hydrogen, helium, carbon monoxide and hydrochloric acid.

People with respiratory problems and heart disease are especially susceptible to volcanic gases. Gases rarely reach populated areas in lethal concentrations, although sulfur dioxide can react with the atmosphere downwind and fall as acid rain.

Pyroclastic flows and surges are mixtures of hot rock fragments that sweep away from their source at hurricane velocity. Because of their high speed and temperature, pyroclastic flows and surges kill or destroy virtually everything in their path.

Volcanic landslides are not always associated with eruptions; heavy rainfall or a large earthquake can trigger landslides on steep volcanic slopes.

3. Check with your local emergency management agency to locate hazard maps of your area. Areas that could be endangered by volcanic ash, pyroclastic flows, lava flows and mud flows are identified in these maps.

During a Volcanic Eruption

1. Do not visit the volcano site; you could be killed by a sudden explosion.

2. If ash is being expelled, avoid areas downwind from the volcano. A building offers good shelter from volcanic ash but not from lava flows and rock debris.

3. Be aware of flying rocks and mudflows. The danger from a mudflow increases as you approach a stream channel and decreases as you move away and toward higher ground. Mudflows can move faster than you can walk or run. Look upstream before crossing a bridge, and do not cross if the mudflow is approaching.

4. If ash is falling, stay indoors until the ash has settled.

5. During an ashfall, close doors, windows and all ventilation in the house.

6. Remove ash from flat or low pitched roofs and rain gutters to prevent thick accumulation.

7. Avoid driving in heavy dust conditions unless absolutely required. If you must drive in dense dust, keep speed down to 35 mph or slower.

8. Avoid driving in heavy dust conditions unless absolutely required. The more dense the dust, the more urgent the requirement should be for driving.

9. When required to drive in dense dust, keep the speed down to 35 mph or lower. Do not follow too close to cars in front of you. Use headlights on low beam.

10. Change oil often. In very dense dust, change at 50- to 100-mile intervals. In light dust conditions, change oil at 500- to 1000-mile intervals. Lubricate all chassis components at each oil change.

11. Clean air filter by backflushing filter paper with compressed air (30 psi). CAUTION! Blow element from inside (clean side) to outside (dirty side). DO NOT strike filter against anything. If you are unsure, have a qualified mechanic perform the air filter service.

12. Cover passenger compartment vent inlet (located at base of windshield and usually under hood) with thick, loosely woven, felt-type material to filter air into vehicle. With vent filter in place, keep heater blower on high. The blower will slightly pressurize the inside of the vehicle and keep dust from entering through body gaps or holes. If a vent filter is not installed, keep air conditioner and heater blowers off.

13. Have a service garage clean wheel brake assemblies every 50 to 100 miles for very severe road condition, or every 200 to 500 miles for heavy dust conditions.

14. Have a service garage clean alternator winding with compressed air after heavy dust accumulation or every 500 to 1,000 miles of severe dust exposure.

15. Wash the engine compartment with a garden hose or steam cleaner. Be sure to seal off

air intakes and electrical components before cleaning.

16. Commercial truck filters can be installed to increase the filtering capacity of the air cleaner. However, this is expensive and should be attempted only by trained garage mechanics or experienced personnel. This would be beneficial for vehicles operating continuously in extreme dust conditions.

Winter Storms

Winter storms can strike any area. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. The results can be isolation from power outages, blocked roads and cars trying to maneuver ice-covered highways. Everyone needs to be prepared to protect themselves from the hazards of winter weather-blizzards, heavy snow, freezing rain and sleet.

Preparing for Winter Storms

1. Being familiar with terminology used by the Weather Service will help you know what to expect when weather warnings are issued. The following terms are used frequently in winter weather releases: Freezing rain occurs when temperatures are below 32 degrees F and rain freezes on impact. This causes an ice coating on all exposed surfaces. If the coating is heavy, falling trees or wires can be additional hazards.

Freezing rain or drizzle is called an ice storm when a substantial glaze layer accumulates. In some parts of the country, ice storms are called "silver thaws" or "silver frosts."

Sleet is frozen rain drops (ice pellets) which bounce on surface impact. Sleet does not stick to objects, but sufficient accumulation can cause dangerous driving conditions. Travelers' advisory means that falling snow and/or drifting snow, strong winds, freezing rain or drizzle will make driving hazardous.

Heavy snow warnings are issued when 4 or more inches are expected during a 12-hour period, or when 6 inches or more are expected during a 24-hour period. Blowing and drifting snow result from strong winds. Blowing, falling snow or loose snow on the ground can produce sizeable drifts. Blizzard warnings are issued when wind speeds of

35 miles per hour or more are expected with blowing or drifting snow. Snow squalls are brief, intense snowfalls accompanied by gusty surface winds. Wind chill factor is the combined effect of wind and cold. A very strong wind combined with a temperature below freezing can have the same chilling effect as a temperature almost 50 degrees lower with no wind. Anyone who is outdoors and exposed to low temperatures and strong winds will be more easily exhausted and more subject to frostbite or death.

ø = temperature in degrees Fareneheit

Temp.	Wind 15 mph	30 mph	40 mph
30F	11øF	-2øF	-4øF
20øF	-5øF	-18øF	-22øF
10øF	-18øF	-33øF	-36øF
0øF	-33øF	-49øF	-54øF
-10øF	-45øF	-63øF	-69øF
-20øF	-60øF	-78øF	-87øF
-30øF	-70øF	-94øF	-101øF
-40øF	-85øF	-109øF	-116øF

Pay attention to weather forcasts and plan accordingly. Include food that needs no cooking in case of power failure. If power is out, keep your refrigerator and freezer doors closed as much as possible. Prevent fires by not overheating your stove, heater or furnace. Don't leave fireplaces unattended. Stay indoors during cold snaps and storms unless you are in top physical condition. If you must go out, don't overexert. Be particularly careful when shoveling snow. Heart attack is a common cause of death during and after winter storms. Remember that cold winds and temperatures put extra stress on your body even if you are in good condition.

Wear several layers of loose-fitting, lightweight, warm clothing. Layers of clothing trap warm air close to your body. You can remove clothing to prevent perspiring and subsequent chill. Outer clothes should be tightly woven, water repellent and hooded if possible. Cover your mouth to protect your lungs from extreme cold. Get your car winterized before the cold season. Use snow tires or chains. Keep the fuel tank filled to prevent water from getting into the fuel and

causing the engine to stall. If you must travel when bad weather is forecast, be sure someone knows where you are going and the time you expect to arrive. Travel with someone else if at all possible.

Blizzards may require long periods of isolation. If you need outside help during this time, you should know the following emergency distress signals to signal aircraft:

Need doctor I

Need medical supplies II

Need food and water . . . . . .F

Need fuel L

International distress signal .. . . . .SOS

Make these signals on the ground where they will be clearly visible from the air. The letters should be at least 10 feet tall. Use black cloth or plastic, hay, boards or other material readily visible on the white snow. If no materials are available, tramp the letters into the snow, deep enough to create as much shadow as possible.

Special Considerations for Travelers

When traveling any distance by car during the winter, observe these safety precautions:

1. Before you leave, have your car checked. A thorough winterizing check should include:

Ignition system,
Battery Lights,
Snow tires installed,
Cooling system
Fuel system
Exhaust system
Heater Brakes
Wiper blades
Defroster
Tire chains and tow chains
Antifreeze Winter-grade oil

2. Select alternate routes before you leave, in case your preferred route isn't
passable.

3. Listen to the radio as you travel and heed latest weather information.

4. Seek shelter immediately if the storm seems severe.

5. Try not to travel alone during a storm. Two or three people are better than one
because they can help each other. Travel with another car if possible.

6. Make sure someone knows where you are going, when you leave, the time you expect to
arrive and your expected route.

7. Always fill your gas tank before entering open country, even for short distances. You
will be less likely to be stranded from running out of gas. In case you are stranded
by the storm, you will have enough fuel to run the motor and heat the car.

8. Drive defensively.

9. Carry a winter storm car kit. This should include:
additional batteries, Windshield scraper, Booster cables, tow chains,
Fire extinguisher, Catalytic heater, Axe, Plastic scraper, Transistor radio with
extra battery, Tools like pliers, screwdriver, adjustable wrench, Flares,

Winterizing Mobile Homes

1. Inspect the roof for leaks and cracks. Water can seep through to damage ceilings,
interior panels or furnishings. When making inspections or repairs, do not walk on
the roof unless it is absolutely necessary. Most repair work can be done from
an extension ladder. Be careful not to lean to the side of the ladder when making
repairs. Instead, move the ladder to the work area.

2. Check locked or lapped roof seams for loose screws, spreading, parting or buckling.
Add new screws if necessary, and cover all seams with roof coating or asphalt-base
paint.

3. Check stacks and vents for cracks, and make sure they are free of debris.

4. Check the flashing for loose screws and separation from the roof. Water can freeze between loose flashing and the roof, causing damage when it melts. If necessary, attach flashing to roof area with a liberal coat of caulking and extra sheet metal screws. Then coat screws and flashing area with roof coating or paint.

5. Check to see that molding is secure where roof meets exterior walls.

6. Check total roof surface for cracks, breaks, rust or oxidation. Scrape or wire brush rusted seams and recoat entire roof.

7. Provide at least one front and rear circulation vent and two side circulation vents when installing skirting. Keep vents free from obstructions. Allow for frost and Ground expansion. Do not apply skirting tight against the ground or tight against the bottom of the unit. Without expansion room, frozen ground can heave the skirting against interior panels, causing wall to buckle.

8. Clean or change furnace filters as recommended by manufacturer. Collected dust can be pulled into the motor, causing it to overheat. Some filters can be cleaned with a Vacuum cleaner; some should be washed in a detergent solution; and others require replacement. Follow manufacturer's instructions for cleaning, oiling and replacing parts.

9. During the summer months when the heater is not used, keep the fuel tank full to prevent condensation and rusting. Use only No. 1 fuel oil or kerosene in the outside fuel tank. No. 2 fuel oil can be used in underground tanks. Never add gasoline or naptha to the fuel oil.

10. If the mobile home is not positioned on concrete pads, frozen ground may cause it to heave or rise. This could make the doors stick. To correct this, turn the jack handle on the front hitch, raising the front as needed. Reverse the jack handle when the ground thaws in the spring and the unit settles again.

11. During sub-freezing temperatures give extra protection to water systems,

especially if the unit is not set on a permanent sub-surface heated basement.

Skirting will help reduce some possibility of freezing damage, but will probably not eliminate the problem. On most modern units, pipes leading from the underground pipe connection to the faucets are protected within the floor system. You will need to protect only the exposed pipes. Use electric heat tape equipped with a thermostat. This material is available at most hardware outlets , and when installing the pipetape, keeping it snug against the pipe. In general, three turns per foot of pipe (a spacing of about 4 inches between spirals) is adequate.

Apply friction tape at 12- to 16-inch intervals to hold the heat tape in place.

Wrap heat tape over the full length of the water pipe from the floor to below frost level. The heat tape should not touch itself at any point because hot spots could develop, causing failure of the tape. Place insulation around the pipe to save electricity. Inch-thick, pre-foamed pipe insulation with a waterproof coating is recommended. Tape all joints with a waterproof tape or seal them with adhesive.

Be sure the thermostat is also covered with insulation. Plug the heat tape cord into an electrical outlet when cold weather arrives.

12. Freezing problems sometimes occur in mobile home drainage systems, especially when drain pipes below the floor are installed with very little slope. To help prevent damage from freezing: Fix leaky faucets. When water flow in drain pipes is very slow (as from a dripping faucet) the water in the pipeline may freeze. This is especially true if faucets drip overnight. Check toilet tanks. Water running or dripping in the toilet tank could cause sewer lines to freeze.

Install electric heating tape on the drain line. Drain pipes are less susceptible to freezing than pipes in a potable water system, so a single strand of heat tape taped to the bottom of the drain line usually will prevent freezing problems. Install insulation over the heat tape. Hold the eave in place with friction tape at 12-inch intervals. Be sure the thermostat is held securely to the pipe and is covered with

insulation. Use preformed pipe insulation with a waterproof cover. Tape all joints in the insulation with waterproof tape.

Winterizing Residential Buildings

When winterizing your house, check each of the following items. Repair as necessary.

Roof

1. Check for broken, damaged or loose shingles; small holes; and loose nails.

2. Check flashing around all dormers, vent pipes, chimneys and any other projections where the roof covering meets an adjoining surface.

Gutters and downspouts

1. Clean out leaves, dirt and debris.

2. Paint any rusty gutters.

3. Check supports.

Exterior

1. Repair cracks in stucco or masonry walls.

2. Spot repair and paint any defective areas to prevent damage from freezing and thawing.

Windows and doors

1. Check weather-stripping around windows, doors and between foundation and siding. Replace where needed.

2. Check metal weather-stripping for dents, bends, breaks, loss of tension or other damage that could make it less effective.

3. Repair and paint storm windows if necessary.

Heating system

1. Have a qualified serviceman clean and check your furnace, replacing necessary parts.

Furnace check should include:

Fan belts check for proper tension, cracks or wear. Motors and bearings oil units equipped with oil parts.

Filters clean or install new filters. Fiberglass filters will need to be replaced because they lose their effectiveness if cleaned and re-used. Hot and cold air registers vacuum if necessary. Humidifier (if part of furnace) remove scale, lime deposits and corrosion. Check float valve and evaporator plate.

2. Remove air conditioner for winter storage. Cover with dust-proof cover. If air conditioner is left in the window, install a weather proof cover and seal the space around the unit.

Driveways and sidewalks

1. Clean and repair cracks, fissures and joints in concrete surfaces.

2. Upgrade gravel driveways.

3. Repair cracks or fissures in asphalt drives. Seal with asphalt topcoating.

Preparations to Reduce Heat Loss from Buildings

1. Install overhead and sidewall insulation. Adequate insulation is one of the most important factors in reducing heat loss and will increase the comfort of your home in both summer and winter.

Under most conditions you need the equivalent of 6 inches of fiberglass thermal insulation over your top floor ceiling; 3« or 4 inches of sidewall insulation is also recommended.

2. Weatherstrip and caulk around all joints and frames of windows and doors.

3. Install storm windows and doors or insulating glass. Storm windows can result in a 10 to 20 percent reduction in heating costs. If buying storm windows is not practical (as when renting), tape clear plastic to the window frame.

4. Clean and change furnace filters regularly. Have furnaces checked and cleaned by a

qualified repairman once a year. Clean and replace air filters when they become loaded with dust or lint.

5. Close window draperies at night. Regular draperies reduce heat loss slightly; insulated draperies cut down heat loss even more.

6. Seal as tightly as possible any openings which may permit cold air leakage from the attic. Leakage is likely to occur around attic stairway doors, pulldown stairways, electric light fixtures, ceiling fans, air ducts and plumbing vents or pipes. Air leakage from the attic not only increases heat loss but also increases the possibility of moisture condensation in the attic. Condensation can wet insulation and building materials, eventually causing structural damage and reducing the effectiveness of the insulation.

7. If your basement is heated, close off upper wall construction that is open to the attic. However, be sure to provide exterior vents into the wall cavity.

8. Repair leaking hot water faucets. Leaky faucets waste both heat and water.

9. Close fireplace dampers when they are not in use. This will keep heated air from escaping up the chimney.

What To Do During a Home Power Failure

During severe winter storms, your home heating system could be inoperative for as long as several days. To minimize discomfort and possible health problems during this time, ake the following steps:

1. Conserve body heat.

2. Put on extra clothing. If cold is severe, your bed may be the warmest place. Extra blankets and coverings will trap body heat. This is a good way to keep children warm. Farm families might consider taking refuge in the relative warmth of the livestock barn.

3. Find or improvise an alterric heater, Gas-fired hot water heater,

4. Provide fuel. Common fuel materials include:

Furnace coal
Canned heat Furnace oil
Wood chips
Campstove fuel
Alcohol
Newspapers, magazines
Charcoal lighter fluid
Kerosene, gasoline
Straw
Firewood
Corncobs

You can burn coal in a fireplace or stove if you make a grate to hold it, allowing air to circulate underneath. "Hardware cloth" screening placed on a standard wood grate will keep coal from falling through. Tightly rolled newspapers or magazines can be used for paper "logs." Before burning the "logs," stack them properly to allow for air circulation. Consider burning wood, including lumber or furniture, if the situation becomes critical.

CAUTION: Do not store fuels in the heated area because of fire danger, especially if you have highly combustible materials such as gasoline or kerosene.

5. Select a room to be heated. To increase efficiency of available heat, close off all rooms except the one to be heated. When selecting a room or area to be heated, consider the following:

If using a vented stove or space heater, select a room with a stove or chimney flue.
Confine emergency heat to a small area.

Try to select a room on the "warm" side of the house, away from prevailing winds. Avoid rooms with large windows or uninsulated walls. Interior bathrooms probably have the lowest air leakage and heat loss. Your basement may be a warm place in cold weather because the earth acts as insulation and minimizes heat loss. Isolate the room from the rest of the house by keeping doors closed, hanging bedding or heavy

drapes over entry ways, or by erecting temporary partitions of cardboard or plywood.

Hang drapes, bedding or shower curtains over doors and windows, especially at night.

6. Provide adequate safety measures. Safety is of prime importance in a heating emergency. Your chances of freezing to death in your home are small. Fire, asphyxiation from lack of oxygen, or carbon monoxide poisoning are much greater dangers unless you take adequate safety precautions. Do not burn anything larger than candles inside your home without providing adequate ventilation to the outside.

Any type of heater (except electric) should be vented. Connect the stove pipe to a chimney flue if at all possible. (Many older homes have capped pipe thimbles in rooms once heated by stoves.) Or hook up your stove to the flue entrance of the nonfunctioning furnace pipe (after removing the pipe). Sometimes a stovepipe can be extended through a window if no other alternative exists. Replace the window glass with a metal sheet, and run the temporary stovepipe through the metal.

Do not run emergency stovepiping close to flammable materials. Be particularly careful with window-mounted flues. The wood sash, curtains and shades are especially flammable. If you use a catalytic or unvented heater, provide plenty of ventilation in the room. Whenever the device is in use, cross ventilate by opening a window an inch on each side of the room. It is better to let in some cold air than to run the risk of carbon monoxide poisoning. Do not burn outdoor barbecue materials such as charcoal briquets inside even in ventillated areas as your resources are used. One person should stay awake to watch for fire and to make sure ventilation is adequate. If the firewatch feels drowsy, it may be a sign of inadequate ventilation. Keep fire fighting materials on hand.

Responses to Other Heat Loss Problems

During a power failure, keeping warm will be a major problem. However, several other related heat loss problems also should be considered.

1. If it seems likely that the heat will be off for several hours in below freezing

temperatures, protect exposed plumbing. Drain all pipes (including hot water heating pipes) in any rooms where temperature falls below 40øF. You may need to drain only portions of your system. Drain the sink, tub and shower traps, toilet tanks and bowls, hot water heater, dish and clothes washers, water pumps and furnace boiler.

2. If your water pump is electrically powered, a power outage could restrict your water use. Save as much water as possible when you drain the system. Store the water in closed or covered containers, preferably where it will not freeze. You may use water from your hot water heater and toilet tanks (not the bowls) for drinking and household use. Water from the heating system will be unfit for drinking or other household use.

3. Keep on hand a good supply of candles, matches and at least one kerosene or gas lantern with ample fuel. Also have a dependable flashlight with spare bulbs and batteries.

4. If your water supply is shut off, sanitation will become a problem. Flush the toilet only often enough to prevent clogging. (Disconnect the chain or lever attached to the toilet handle to prevent children from flushing.) Provide covered containers for disposing of toilet paper. A portable camper's toilet might be useful.

5. Camp stoves or fireplaces may be used for cook stoves in an emergency. Meal-in-a-can foods such as stews, soups, canned meats, beans or spaghetti require little heat for cooking, and some can be eaten without cooking. Cereals, breads, dried meats and cheese are other "no cook" possibilities. Freeze-dried meals used by campers and backpackers can be prepared with a minimum of heat.

Protecting Your Hot Water System During A Winter Storm Power Failure

1. If you think the heat will be off several hours or more during below freezing

temperatures, you will need to keep exposed heating pipes from freezing. This can be done by circulating water through the pipes or adding antifreeze to the system.

2. If electrical power is available, keep the circulator pump going. Moving water does not freeze readily. However, if the room temperature drops to below 40øF, you probably should begin to drain the pipes.

3. Most hot water heating systems are not easily drained. Pipes may have to be disconnected to drain low points. Open the vents on radiators to release air so pipes can drain.

4. Consult a heating contractor about adding antifreeze to your system. Antifreeze is poisonous and must not be allowed to get into the drinking water system. Make sure the house water system and the boiler water system are not connected. Use only antifreeze containing ethylene glycol. Do not use antifreeze containing methanol. (Methanol vaporizes readily when heated, and could cause excessive pressure in the system.) Make sure the antifreeze does not contain leak-stopping additives. These may foul pumps, valves, air vents and other parts.

Protecting Your Plumbing System During A Winter Storm Power Failure

1. Shut off the water at the main valve, or turn off the well pump if it is in the house.

2. Drain the pressure tank.

3. Open all faucets until they drain completely! Some valves will open only when there is water pressure. If so, remove the valve from the faucet.

4. Drain the entire system by disconnecting pipe unions or joints as close to the main valve as possible. You may use compressed air to blow water from pipes.

5. Insulate undrainable pipes around their main valves. Use newspaper, blankets or housing insulation.

6. Drain toilet flush tanks and spray hoses controls. Lay the softener tank on

its side to drain as much water as possible. Also drain controls and tubing on brine (salt) tank. A brine tank itself will not be harmed by freezing.

Protecting Your Sewage System During A Winter Storm Power Failure

1. Empty all drain traps by carefully removing drain plugs or by disconnecting traps.

2. Blow out inaccessible traps with compressed air or add ethylene-glycol base antifreeze in an amount equal to the water in the trap (1 pint to 1 quart is sufficient, depending on the size of the trap).

3. Check kitchen sinks, bathroom sinks, bathtub drains, toilets, washtubs, showers, floor drains and sump pumps.

Protecting Appliances During A Winter Storm Power Failure

1. Disconnect the electric power or shut off the fuel to all water-using units.

2. Shut off the water supply and disconnect the hoses if possible.

3. Drain all water-using appliances.

4. Check the water heater, humidifiers, ice-making unit of the refrigerator, washing machine and the dishwasher. Do not put antifreeze in these appliances. Close valves to the furnace, water heater and dryer.

Preventing Ice Dams on Eaves

Ice dams along eaves may cause considerable damage to the roof and inside walls of a house. Poorly insulated roofs are the chief cause of ice build-up on eaves. Ice forms when the snow melts off a warm roof, runs down to the eave line, and refreezes there.

Ice in the eave trough prevents water from running off freely. If water backs up high enough, it may seep under shingles and down into the house. Sometimes it leaks through plaster walls and ceiling. Ice dams are usually a problem only on cold days when the roof is warmer than the eave overhang. On warm days the snow melts at the same rate on the eaves and water runs off freely.

To prevent ice dams:

1. Insulate between the top floor ceiling and the attic, or along the underside of the eaves if the attic is used as living space. Insulation also will help cut fuel cost.

2. Ventilate the attic through windows and louvers when insulation is added to the attic floor. This will help reduce moisture condensation in the attic.

3. Use electric heating cables along the eaves if insulation or ventilation is not possible. Cables can be strung out along the edge of eaves. When plugged in, they will heat the area, melt any ice already formed and prevent further freezing when water drips off the roof. Be sure cables are approved for the intended use by the Underwriters Laboratory. Check with your electrician for correct installation.

4. Do not use salt to melt snow or ice from roof. Salt will rust nails, damage gutters and downspouts, and ruin next year's lawn.

Responses to Take When Caught Outdoors During A Winter Storm

Hunters, sportsmen or snowmobile riders occasionally become lost or injured in severe winter weather. Be sure someone knows where you are going and when you plan to return. Don't travel alone. Dress properly. If you do become stranded:

1. Remain calm. Don't rush to get out immediately. You can easily become disoriented and lose your way during a snowstorm.

2. Build a shelter for the night, preferably on the leeward side of brush or timber. In timber country a lean-to gives good protection. Construct one by using two "Y" poles for corners and a sturdy cross shaft. Place poles from cross shaft to the ground and cover with evergreen boughs. In open country where snow is shallow and the temperature isn't too cold, a snow trench can provide adequate shelter. "Snow caves" (in snow at least 4 feet deep) provide the warmest shelter during cold weather. Dig your cave on the leeward side of a drift. Be sure that you don't locate the opening

under an overhanging drift or in a possible avalanche path. Cover the bottom of your shelter with boughs, grass or sticks if they are available. Soft, springy boughs are good for a mattress.

3. Gather a fuel supply that will last throughout the night. Gather fuel while it is still daylight. Build a fire approximately 2 feet from the shelter, using a log or piled rocks to reflect the heat. When daylight comes again, be prepared to increase the size of the fire. Try to produce as much smoke as possible to signal rescue parties. Extreme cold and over exertion can cause a heart attack in cold weather conditions.

4. Stay in your car where you are sheltered and more likely to be found. You can become quickly disoriented when trying to walk around in blowing snow.

5. Stay calm.

6. Keep fresh air in your car. Freezing wet and wind-driven snow can seal the passenger compartment and suffocate you. Keep the downwind window open about an inch when you run the motor and heater. Be sure snow has not blocked the exhaust pipe.

7. Exercise from time to time by clapping hands and moving arms and legs vigorously. Don't stay in one position long.

8. Keep the dome light on at night to make the car visible to snow plows or rescue crews.

9. Have one person keep watch. Don't allow everyone in the car to sleep at once.

10. In a snowstorm, automobile parts can sometimes be used for emergency tools:
A hubcap or sun visor can be used as a shovel. Seat covers can serve as blankets.
Floor mats will help shut out wind and cold. Place them against windows on the upwind side to help reduce drafts. Engine oil burned in a hub cap creates a smoke signal visible for miles. To light the oil, prime with a little gasoline or use paper for starter fuel. Signal with the horn. An automobile horn can be heard as far as a mile downwind.

Special Considerations for Agricultural Producers, Preparing for a Winter Storm

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

1. Be aware of winter storm terminology. Stockman advisories are issued with combinations of cold, wet and windy weather, specifically, cold rain and/or snow with temperatures of 45øF or colder and winds of 25 miles per hour or higher. If the temperatures are in the mid-30s or lower the wind speed criteria are lowered to 15 miles per hour.

2. Stockmen also should consider the effect of the wind chill factor on livestock.

Providing Windbreaks for Livestock Protection

1. Simple shelters, sheds or windbreaks are necessary to protect livestock from winter storms. Usually, severe cold alone will not affect the performance of animals on full feed. Wind, however, can be a serious stress factor. A strong wind has about the same effect on animals as exposure to a sudden drop in temperature. In general, a 20 mph wind is approximately equivalent to a 30øF drop in temperature. Under extreme conditions, simple wind and snow protection devices will not be 100 percent effective.

2. Consider wind and snow as a joint problem when deciding the kinds of livestock protection you need.

3. Simple windbreaks, shelters or sheds are essential for livestock protection from wind and snow.

4. The effectiveness of a windbreak depends on its height and density. Windbreaks may be natural (trees) or manmade (fences).

5. Cottonwood or poplar trees are relatively ineffective as windbreaks because of their low branch density. Supplement these trees with thick-growing trees such as red pines, or with fences.

6. Snow fences can be good substitutes for tree windbreaks which take time to grow and are not practical under all conditions.

7. Porous fences of 80 percent density offer the best wind protection.

8. Snow will drift through a porous fence. A solid fence keeps most of the snow outside a yard and provides the best snow barrier, but may direct snow to other parts of the farmstead. Porous fences can give good snow control if you locate the fences to allow for the resulting drifts.

9. Swirling and relocation of snow within a farmstead is often the main cause of drifting problems.

10. Shallow open-front sheds provide excellent shelters for livestock. Such shelters should have slot openings along the eaves on the back side of the shelter. These openings will provide ventilation and prevent snow from swirling into the front of the shed. Plan slot size according to building width. You should have a 1- to 2-inch opening per 10 feet of building width. Ridge ventilators also are recommended.

11. Do not attach windbreak fences directly to the front corner of an open-front shed. Instead, use a swirl chamber arrangement. Attach a separate short fence to the building. Start the longer fence behind it and away from the building.

12. Divide long open-front sheds into 20- to 40-foot sections to reduce drafts and possible snow build-ups.

13. Locate shelters so that adjacent buildings will not deflect wind and snow into a shed.

Creating Windbreaks On Your Property

1. On some farms a windbreak may be necessary for protection from strong winds and blowing snow. A windbreak will:

Protect livestock and reduce winter feed requirements.
Help protect homes and reduce fuel use.
Help eliminate snow drifting around farmstead buildings and work areas.

2. Plan the windbreak before you plant. In designing the windbreak you should consider

size and location, tree species, tree spacing and soil preparation.

3. To give the best protection from wind and snow a windbreak should be:

Located to the northwest of the farmstead L-, U- or E-shaped, with the ends extending about 50 feet beyond each corner of the area to be protected

At least 50 feet and preferably 100 feet from farm buildings and feedlots on level land (If your land slopes steeply to the north or west, plant trees closer to the farmstead, but no closer than 60 feet from the many trees, especially evergreens, are susceptible to "nitrogen burning." If any section of the windbreak is likely to be saturated by barnyard seepage, plan to construct a ditch or use drainage tile to carry the seepage away from trees.

5. Do not plant windbreaks where they could cause visibility hazards at intersections.

6. If it is necessary to cross fields, driveways or large ditches with a windbreak planting, try to make the crossing at oblique angles. This will prevent direct wind tunnels through the planting.

7. Windbreaks should contain several tree species. A mixture of species offers protection against disease, insects and weather damage, and takes advantage of differences in growth rates. Both deciduous and evergreen species should be included, but all trees must have adequate space. Select low, dense growing shrubs for outside rows. Plant medium sized trees next, and tall growing trees in center rows.

Your choice of species will depend on your needs, climate and type of soil. Contact your county Extension agent for information about appropriate windbreak species for your area.

8. Sod, loosely powdered soil or field soil is best for tree planting. In late summer or early fall, plow heavy soil and soil covered with sod. If the soil has been deeply plowed and is relatively loose, roll or cultipack it.

During winter months cover light or sandy soils with organic material such as

well-rotted manure. This will increase soil fertility and reduce the possibility of erosion and moisture losses during winter and early spring. In dry regions summer fallow the land during the year prior to planting. Cultivate frequently enough to prevent any weed or plant growth and to keep the soil in suitable condition for absorbing moisture. If the soil is sandy and subject to blowing, plant a cultivated row crop such as corn instead of summer fallowing. Thoroughly disc and harrow the soil just before planting.

9. Do not overcrowd trees. Trees must have adequate space, especially when deciduous and evergreen species are mixed. Allow at least 20 feet between deciduous and evergreen species. A five-row planting is recommended for the most efficient windbreak but if space is limited use fewer rows rather than overcrowd trees.

Properly spaced trees will have increased growth and vigor. Stagger trees in adjacent rows to offset wide spaces between young trees. Be sure to allow enough space for operating any necessary maintenance equipment.

10. Plant trees as soon as possible after receiving them. If you must hold trees for a few days before planting them, unpack them and heel them in until they are to be planted. Keep roots moist at all times during planting. Plant in rows according to predetermined plan. For specific planting instructions, contact a local nursery or your county agricultural Extension agent.

11. Provide protection and care for young seedlings. Protect trees permanently from poultry and livestock. Protect trees from rodents. Use screen wire, tree wrap materials or commercial repellents. Inspect trees periodically for disease or insect damage. To eliminate competition from grass or weeds, cultivate often

Cold weather causes additional stress on livestock, increasing their need for food, water and shelter. To minimize livestock loss during winter storms, stockmen should:

1. Move stock, especially the young, into sheltered areas. Windbreaks, properly oriented and laid out, or timber-covered lowlands are better protection for range cattle than most shed-type shelters which may overcrowd and overheat cattle, causing subsequent respiratory disorders. Never close indoor shelters tightly because stock can suffocate from lack of oxygen. Extremities that become wet or are normally wet are particularly subject to frostbite and freezing during sub-zero weather. The loss of ears or tails may be of little economic significance, but damage to male reproductive organs can impair the animals' fertility or ability to breed.

2. During severe or prolonged cold weather, animals need extra feed to provide body heat and to maintain production weight gains. A grain ration that maintains an animal during the summer may not carry it through the stress of prolonged or severe cold.
Haul extra grain to feeding areas before the storm arrives. If the storm lasts for more than over 48 hours, emergency feeding methods may be required. Pelleted cake or cake concentrates make good emergency feed. Mechanized feeders may be inoperable during power failures unless you have a source of emergency power.

3. Use heaters in water tanks to provide livestock with enough water. Cattle cannot lick enough snow to satisfy their water requirements.

Caring for Livestock After a Blizzard

1. Following a blizzard, water will be a crucial need for livestock. Cattle will not be able to satisfy all of their water requirements by eating snow. In pastures with severe drifting, water in shallow streams may be absorbed by snow in the stream bed. Very little, if any, running water may be available for several days. You may need to haul water to cattle. If water is limited, keep cattle off salt. Cattle which have been away from feed and water for several days may overeat salt, causing salt poisoning.

2.When stock cannot be reached by roads, use planes, helicopters or snowmobiles to provide emergency rations. Feedlot cattle that have gone through a severe storm or

stress period should be put back on feed carefully. Change the ration gradually from a low to a high proportion of concentrate. Watch your herd carefully for several weeks following prolonged exposure. Isolate cattle showing signs of scouring or labored breathing. Keep these animals in a dry, draft-free place and contact a veterinarian. Cattle which have not been fed for several days or are unaccustomed to grain should be limited to Two to fourpounds per head of whole grain in one feeding, or a total of five pounds per head the first day. Increase the amount of feed by two lb/head/day for large cows. Make any additional increases slowly. Add hay, even poor quality roughage, to the ration as soon as possible. Feeding three pounds per head of hay daily will greatly reduce the possibility of founder (acute indigestion). Cattle can use hay to better advantage than grains when they must be fed on the ground. Even moisture-saturated hay can be used until suitable feed is available. Do not use mildewed hay. Depression, followed by colic and diarrheacan occur. Animals may die in a few days. Some survivors may develop acute lameness. Prompt treatment can reduce deaths, crippling and recurring digestive disturbances.

Feeding Sheep After a Blizzard

1. If sheep, especially pregnant ewes, are withheld from feed heavy losses may occur.

2. Ewes in good flesh late in pregnancy may incur pregnancy disease if they are without feed for even a short time. Early symptoms of pregnancy disease include istlessness and depression. As intoxication advances, ewes develop a wobbly gait, become uncoordinated and die.

3. Sheep can eat 1 to 3 pounds of whole grain per day. A small amount of roughage will prevent digestive trouble. Drying feed before giving it to sheep can reduce the possibility of digestive problems.

Feeding Horses After a Blizzard

1. Horses fed a maintenance ration adequate for summer conditions may need additional energy in their winter feed.

2. They can tolerate reduced rations for a few weeks unless they are mares nursing foals.

Feeding Swine After a Blizzard

1. Swine present few problems during periods of feed shortage. If you are substituting other feed, such as dairy feed, for regular swine feed, be sure swine have adequate fresh water available at all times. The salt content of cattle feed will produce salt poisoning in swine unless they have constant access to water.

Protecting Poultry and Livestock During a Winter Storm Power Failure

1. Ventilate shelter. Do not close buildings tight to conserve heat because animals could suffocate from lack of oxygen. Because oxygen eventually will be used up in mechanically ventilated production facilities, clear ice and snow from all vents. Then open vents to facilitate natural air flow.

2. Poultry facilities should be equipped with knock-out panels for emergency ventilation.

3. In dairy facilities, open door or turn cows outside.

4. Provide water. All animals, especially cattle, need plenty of water during cold weather. It may be possible to drive your water pump with a small gasoline engine and a belt. Otherwise, you will need to haul water. If you have an outside source of water, cattle can be turned out to it. Be sure to place sand or other gritty material on icy feedlots to provide good footing. Whatever the source of water, watch that it remains unfrozen so animals can drink it.
If no water is available, dairymen can feed cows their own milk as a last resort.

5. Provide heat. Use camp stoves and heaters as emergency heat sources for brooders. Plan ahead to have this equipment ready when needed.

6. Provide feed. Animals need extra energy for body heat during severe or prolonged cold weather, especially if they are outside without shelter. Mechanical feeders will be inoperable during a power failure. Provide for emergency feeding procedures. Pelleted cake or cake concentrate may be used for emergency feed.

Protecting Equipment During A Winter Storm Power Failure

1. Unplug or turn off all electric equipment to prevent damage when power is restored.

2. If you use portable space heaters for supplemental heat, close off the fuel valve as soon as possible after power is interrupted. On models not equipped with safety shut-offs, and especially on some models with gravity feed fuel systems, fuel continues to flow even when the burner is inoperative. An explosion or fire can result when power is restored.

Storing Milk and Cream During A Winter Storm Power Failure

1. You can use the intake manifold on the tractor engine as a source of vacuum to operate milkers that do not have a magnetic pulsator.

2. Ask the dairy to pick up milk as soon as possible.

3. Consider adding a standby power generator to handle vital electric equipment on the dairy.

4. Even if you are short of extra milk storage facilities, do not store milk in stock tanks or other containers such as bathtubs. Dairy plants may not accept milk that has been stored in anything other than regular milk storage containers. Check with your local dairy about policy regarding emergency storage of milk and cream.

5. Check your tank for souring each time you add milk to it if you are unable to cool your milk or have it picked up. This check could mean the difference between losing all or only part of your milk supply.

Repairing Ice and Snow Damage to Shrubs and Trees

1. To prevent ice damage to trees or shrubs, try to remove ice before winds cause major damage. Do not try to break ice off branches. Connect a garden hose to the hot water faucet to melt the ice. If branches have been badly damaged, remove or repair them as suggested below.

2. Heavy accumulations of wet snow can cause damage to trees and shrubs. Evergreens and weak-wooded trees are more susceptible to snow damage than deciduous and

hard-wood trees. Snow damage is more common to shrubs than to trees because snow depth often equals or exceeds shrub height. Evergreen shrubs are more easily damaged ove heavy snow ccumulations:

Tap the branches lightly with a broom soon after the snow falls or as it accumulates. If snow has melted and refrozen, do not use this procedure because you could break the branches. To remove frozen snow, spray the shrubs with a hose connected to the hot water faucet. Shrubs also may be damaged when snow from walks or drives is piled onto them, or when salt is used for snow removal along drives, walks and streets. With a hose, wash off shrubs that have been splashed with salt from streets. Often snow damage to evergreens is not apparent until the following spring as a broken branch will retain its green color until warm weather.

3. Determine whether the tree can be repaired, or if it should be removed completely.

If the main trunk is completely broken or if the tree is uprooted, it should be removed. Most broken branches can be either repaired or pruned. Some branches broken at a crotch can be lifted into place and then bolted and cabled. Remove broken branch to the nearest branch or to the tree trunk. Never leave a ragged stub. Remove large branches with three cuts. This will prevent splintering and peeling. Make the first cut upward from the bottom of the branch about 12 inches from the next branch. Cut about halfway through the branch, or until the saw begins to pitch. Make the second cut 5 or 6 inches further out, and continue cutting until the branch falls. With a third cut remove the stub cleanly without peeling.

Treat the wound.

United States
Department of
Agriculture

National
Agricultural
Statistics
Service

Pr 1-3 (99)

Agricultural Prices
1998 Summary

July 1999

Agricultural Prices

1998 Summary

The 39th Annual Summary of Agricultural Prices contains prices farmers received for commodities sold as well as prices paid for production input goods and services. Prices are weighted and aggregated into price indexes. These indexes provide measures of relative price changes for agricultural outputs and inputs.

The State, Regional, and U.S. average prices for agricultural commodities and farm production inputs are based on voluntary reports from agri-business firms, merchants, dealers, and farmers throughout the Nation. These data are collected at regular intervals using mailed inquiries, telephone, and personal enumeration. We greatly appreciate the cooperation and support of all the individuals and firms that have provided data.

Estimates of prices received by farmers are published by state for crops (1997- 98), vegetables (1996-98), and livestock and poultry (1997-98). Estimates for prices paid by farmers for feed, fuel, and fertilizer are published by region for 1997. Prices paid for all other surveyed items are published for 1997 at the U.S. level. U.S. price indexes for both prices received and paid including any index revisions are published for 1991-98.

Preliminary crop prices for 1998 and fruit and vegetable prices for 1997 and 1998 are subject to revision. Prices received for livestock and poultry are final estimates Prices received and prices paid revisions are first published in the monthly issues of "Agricultural Prices" and again in the Annual Summary.

* * * * * * *

July 1999

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Agricultural Commodity Prices represent monthly and marketing year averages
received by farmers at the point of first sale for all grades and qualities of
the commodity sold. Points of first sale by farmers range from bulk sales at
the farm to packed and graded products delivered to a local market. For crops
the price refers to all sales, regardless of the year harvested. The average

price concept is that price which would result from dividing the total dollars received by all farmers, before any marketing charges are deducted, by the total quantity sold. Contract sales are reported in the month of settlement, not when the contract is made. Prices are on an "as sold" basis, with the following exceptions: milk is priced f.o.b. plant or receiving station; fruit and vegetable pricing is covered in detail on page A-2.

Monthly Prices are based on all sales of the commodity during the entire month. Exceptions are hay, eggs, and turkeys which are based on the 5-day period centered on the 15th of the month. State commodity prices are estimated for months when at least 0.5 percent of the annual sales occur. Weights for computing monthly United States average prices are based on estimated marketings during the month by State.

Marketing Year Average (MYA) Prices are weighted average prices for crops, livestock, and poultry items sold during the marketing year. Commodity marketing years are defined on pages A-13 and A-14. State marketing year average prices are computed by weighting monthly prices by the estimated percentage of monthly sales during the marketing year. State and U.S. monthly and marketing year average prices for crops are open-market prices excluding Government program payments or allowances for unredeemed loans and purchases by the Government. Government payments to farmers are included in farm income accounts as a separate cash receipt item. U.S. marketing year average prices for corn, sorghum, oats, barley, wheat, rice, soybeans, flaxseed, sunflower, and upland cotton are computed by weighting U.S. monthly prices by monthly marketings for the U.S. marketing year. Other crops, livestock, and poultry U.S. marketing year average prices are computed by weighting State marketing year average prices by the estimated quantity sold in each State.

Preliminary Marketing Year Average Price estimates for 1998 are based on price data through December 1998 for all field crops except tobacco which is based on data through April 1999. Marketing years for fruit, vegetables, and nuts vary by State and commodity. Allowances are made for the portion of the crop expected to be marketed during the remainder of the marketing year for all

commodities except cotton.

Monthly and Marketing Year Average Crop Prices for 1997 are final except for fruit. Crop prices for 1998 are subject to revision. These revisions will be published first in the monthly issues of Agricultural Prices and then in the "Annual Summary". Livestock, livestock products and poultry prices are final estimates for 1997 and 1998. Prices for agricultural commodities may be revised during the Agency's five-year review of production estimates. Price revisions resulting from this review are usually small and generally are the result of reweighting State prices to the U.S. level. State monthly and MYA prices for noncitrus fruit sold for fresh market are the weighted average of prices received by producers at the points of first sale. Points of first sale include f.o.b. shipping point, farm, roadside, U-pick, farmer's market, grower auctions, and bulk sales to a packer. The exceptions to this are California, Washington, New York (apples only), and Oregon (excluding peaches), which use equivalent returns at the packinghouse-door. This is a f.o.b. packed shipping point price adjusted back to the packinghouse-door by subtracting all costs that accumulate between the packinghouse and the f.o.b. shipping point. Costs include cleaning, grading, packing, inspecting, and marketing. U.S. monthly prices are the weighted averages of the state prices. U.S. MYA prices are derived by dividing the sum of the states' values of production by their sum of production. Monthly prices include all fruit sold in a month regardless of the crop year in which it was harvested.

State MYA prices for noncitrus fruit sold for processing are the equivalent returns producers receive for fruit delivered to the processing plant door. The exceptions are California olives and clingstone peaches, which are prices at the first delivery point, and cranberries, which is a weighted average of adjusted co-op pool proceeds and independent sales at the first delivery point. U.S. MYA prices for noncitrus processing fruits are derived by dividing the sum of states' values by their sum of production. There are no monthly price series of noncitrus processing fruits.

State and U.S. MYA prices for noncitrus crops at the "all sales" level (fresh and processing) are derived by dividing total value by total production.

State monthly citrus prices are based on weighted average f.o.b. packed prices received for fresh fruit, and weighted average prices received at the processing plant door for processing fruit. Equivalent returns for fresh and processed fruit are calculated at the packinghouse-door and on-tree levels by deducting picking, hauling, sorting, grading, packing, cooling, marketing, and other costs from the two base prices.

State MYA prices and equivalent returns for citrus are calculated from the weighted average fresh and processed prices received each month in the crop's marketing season. The crop year 1997-98 as shown on all citrus tables in this publication refers to the crop which bloomed in 1997 and was marketed during the 1997-98 season. (See page A-18 for a description of the citrus marketing seasons.)

Monthly and MYA citrus prices at the U.S. level are the average of the states' prices weighted by their box movement and approximate net weight per box. The box weights used are as follows: Grapefruit: Arizona and California Desert Valleys - 64 lbs., other California areas - 67 lbs., Florida - 85 lbs. and Texas - 80 lbs.; Lemons - 76 lbs; Limes - 88 lbs.; Oranges: Arizona and California - 75 lbs., Florida - 90 lbs., and Texas - 85 lbs.; Tangelos - 90 lbs.; Tangerines: Arizona and California - 75 lbs., and Florida - 95 lbs.; Temples - 90 lbs.

State monthly fresh market vegetable prices are f.o.b. shipping point, f.o.b. equivalents, or point of first sale prices. The state MYA prices for fresh market vegetables are the weighted average of the monthly prices using estimated monthly movements. U.S. monthly prices are the weighted average of state prices. U.S. MYA prices are derived by dividing the sum of states' values of production by their sum of production. (Prices for broccoli, carrots, cauli flower, celery, and onions may include some processing.)

Indexes of Prices Received and Paid, United States, 1991-98

Index	1991	1992	1993	1994	1995	1996	1997	1998
	Prices Received (1990-92=100)							
All Farm Products	100	98	101	100	102	112	107	101
All Crops	101	101	102	105	112	127	116	106
Food Grains	94	113	105	119	134	157	128	103
Feed Grains & Hay	101	98	99	106	112	146	117	100
Cotton	108	88	89	109	127	122	112	107
Tobacco	102	101	101	101	103	105	104	104
Oil-Bearing Crops	99	100	108	110	104	128	131	107
Fruit & Nuts	112	99	93	90	97	118	108	110
Commercial Vegetables	100	111	117	109	121	111	122	119

Potatoes & Dry Beans	99	88	107	110	107	114	90	99
All Other Crops	97	102	103	105	106	108	108	108
Livestock & Products	99	97	100	95	92	99	98	97
Meat Animals	101	96	100	90	85	87	92	79
Dairy Products	94	100	98	99	98	114	102	119
Poultry & Eggs	99	97	105	106	107	120	113	117
Food Commodities	99	99	102	98	99	108	105	100
			Prices Paid (1990-92=100)					
Prices Paid by Farmers for Commodities & Services, Interest, Taxes, & Wage Rates	100	101	104	106	109	115	118	117
Production Items	100	101	104	106	108	115	119	115
Feed	98	99	102	106	103	129	125	110
Livestock & Poultry	102	96	104	94	82	75	94	88
Seed	99	99	101	108	110	115	119	122
Fertilizer	103	100	96	105	121	125	121	112
Agricultural Chemicals	101	103	109	112	116	119	121	122
Fuels	104	96	93	89	89	102	106	88
Farm Supplies & Repairs	100	104	107	109	112	115	118	119
Autos & Trucks	100	102	107	111	115	118	119	119
Farm Machinery	100	104	107	113	120	125	128	133
Building Materials	100	101	106	109	114	115	118	118
Farm Services	98	103	110	110	115	116	116	117
Rent	100	104	100	108	117	128	136	134
Interest	100	93	87	94	102	106	106	109

Taxes	101	104	108	106	109	112	115 119
Wage Rates	100	105	108	111	114	117	123 129
Production Items, Interest, Taxes & Wage Rates	100	101	103	106	108	115	118 116
Ratio 1/	99	97	97	94	93	98	90 87

1/ Ratio of Index of Prices Received by Farmers (All Farm Products) to Index of Prices Paid by Farmers for Commodities & Services, Interest, Taxes, and Wage Rates. May not compute directly due to rounding.

Relative Weights of Commodities in the Index of Prices Received, Base Weight Period 1990-92

Commodity and Group	Relative Weight	Commodity and Group	Relative Weight
	Percent		Percent
Wheat	4.0	Onions	.5
Rice	.7	Sweet Corn	.4
Food Grains	4.7	Tomatoes	1.6
		Broccoli	.2
Corn	8.3	Cantaloupes	.2
Oats	.1	Cauliflower	.2
Barley	.5	Cucumbers	.3
Grain Sorghum	.7	Snap Beans	.3
All Hay	1.8	Commercial	
Feed Grains and Hay	11.4	Vegetables	5.1
American Upland	2.8	Dry Edible Beans	.3
Cotton	2.8	Potatoes	1.3
		Potatoes and Dry	
Tobacco	1.7	Beans	1.6
Cottonseed	.3	Other Crops	7.5
Peanuts	.8		
Soybeans	6.5	All Crops	48.4
Sunflower	.2		
Oil-Bearing Crops	7.8	Beef Cattle	22.0

		Calves	1.9
Apples	1.2	Hogs	6.7
Grapefruit	.3	Meat Animals	30.6
Lemons	.2		
Oranges	1.2	Milk, Wholesale	11.7
Peaches	.3	Dairy Products	11.7
Pears	.2		
Strawberries	.5	Eggs	2.4
Grapes	1.4	Broilers	5.4
Almonds	.5	Turkeys	1.5
Fruit and Nuts	5.8	Poultry and Eggs	9.3
Asparagus	.1	Livestock and	
Carrots	.3	Products	51.6
Celery	.2		
Lettuce	.8	All Farm Products	100.0

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						All Farm Products							
						1910-14=100							
1991	632	633	650	648	659	639	622	621	625	621	620	616	632
1992	617	630	638	627	629	635	630	634	629	617	611	613	626
1993	618	623	632	662	657	641	640	648	650	642	650	656	643
1994	665	663	664	650	643	636	617	618	617	604	608	627	634
1995	623	620	628	630	637	637	646	653	662	661	670	685	646
1996	686	676	695	686	709	750	754	746	738	714	699	688	712
1997	683	666	685	676	686	683	678	684	680	682	681	667	679
1998	652	640	649	658	657	649	645	640	629	629	631	624	642
						1990-92=100							
1991	100	100	102	102	104	101	98	98	98	98	98	97	100
1992	97	99	100	99	99	100	99	100	99	97	96	96	98
1993	97	98	99	104	103	101	101	102	102	101	102	103	101
1994	105	104	105	102	101	100	97	97	97	95	96	99	100
1995	98	98	99	99	100	100	102	103	104	104	106	108	102
1996	108	106	109	108	112	118	119	117	116	112	110	108	112
1997	107	105	108	106	108	107	107	108	107	107	107	105	107
1998	103	101	102	104	103	102	102	101	99	99	99	98	101

					All Crops								
					1910-14=100								
1991	484	482	509	515	541	508	475	482	492	483	494	485	496
1992	497	512	534	510	498	509	495	497	494	477	471	476	498
1993	474	478	478	528	512	490	503	515	517	508	524	537	505
1994	545	545	540	520	528	534	506	499	507	490	498	525	520
1995	508	504	528	556	574	559	565	567	564	559	571	584	553
1996	597	606	638	634	646	691	674	656	621	589	575	558	624
1997	569	558	584	572	581	587	565	575	564	566	567	548	570
1998	539	536	546	562	554	525	526	508	494	491	500	491	523
					1990-92=100								
1991	98	98	103	104	110	103	96	98	100	98	100	98	101
1992	101	104	108	103	101	103	100	101	100	97	95	97	101
1993	96	97	97	107	104	99	102	104	105	103	106	109	102
1994	111	110	109	106	107	108	103	101	103	99	101	106	105
1995	103	102	107	113	116	113	114	115	114	113	116	118	112
1996	121	123	129	129	131	140	137	133	126	119	117	113	127
1997	115	113	118	116	118	119	115	117	114	115	115	111	116
1998	109	109	111	114	112	107	107	103	100	100	101	100	106

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Food Grains							
						1910-14=100							
1991	264	269	282	291	293	277	271	286	306	332	349	368	299
1992	375	395	388	379	379	365	337	321	337	336	341	346	358
1993	349	337	330	325	316	300	301	310	320	336	369	390	332
1994	387	402	411	396	382	348	327	345	374	385	382	387	377
1995	382	368	360	358	379	407	434	448	472	489	498	511	426
1996	501	505	512	534	584	555	504	487	467	445	437	437	497
1997	434	426	431	446	442	382	352	388	399	395	392	379	406
1998	369	372	376	361	345	306	283	270	279	319	335	322	328

	1990-92=100												
1991	83	85	89	92	92	87	85	90	96	104	110	116	94
1992	118	124	122	119	119	115	106	101	106	106	107	109	113
1993	110	106	104	102	99	94	95	98	101	106	116	123	105
1994	122	126	129	125	120	109	103	109	118	121	120	122	119
1995	120	116	113	113	119	128	137	141	148	154	157	161	134
1996	158	159	161	168	184	175	159	153	147	140	137	137	157
1997	137	134	136	140	139	120	111	122	126	124	123	119	128
1998	116	117	118	114	109	96	89	85	88	100	105	101	103
	Feed Grains and Hay												
	1910-14=100												
1991	355	361	372	379	371	355	346	353	356	357	355	359	360
1992	368	373	376	375	385	375	354	341	334	319	313	315	352
1993	323	324	337	348	354	345	354	358	351	359	382	410	354
1994	417	427	421	416	413	406	368	354	352	331	322	344	381
1995	347	355	364	373	387	393	408	410	414	435	446	468	400
1996	474	502	520	568	605	593	607	593	525	444	415	411	521
1997	421	423	440	452	442	422	401	407	405	402	399	399	418
1998	402	405	405	388	385	374	361	326	307	306	308	319	357
	1990-92=100												
1991	99	101	104	106	104	99	97	99	99	100	99	100	101
1992	103	104	105	105	108	105	99	95	93	89	87	88	98
1993	90	91	94	97	99	97	99	100	98	100	107	115	99
1994	117	119	118	116	115	113	103	99	98	92	90	96	106
1995	97	99	102	104	108	110	114	115	116	122	125	131	112
1996	133	140	146	159	169	166	170	166	147	124	116	115	146
1997	118	118	123	127	124	118	112	114	113	112	112	112	117
1998	113	113	113	109	108	105	101	91	86	85	86	89	100

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
	Cotton												
	1910-14=100												

1991	549	574	582	587	593	571	560	560	549	532	517	471	554
1992	437	421	425	449	450	490	476	445	446	456	445	459	450
1993	448	455	476	466	460	453	454	443	434	443	451	478	455
1994	530	555	563	571	583	535	496	565	551	560	579	620	559
1995	665	678	698	656	644	670	677	610	632	627	634	640	653
1996	646	640	649	667	648	650	622	608	605	604	589	586	626
1997	574	576	586	571	577	567	571	566	588	587	574	539	573
1998	516	528	540	538	537	589	575	560	567	561	550	513	548
						1990-92=100							
1991	107	112	114	115	116	111	109	109	107	104	101	92	108
1992	85	82	83	88	88	96	93	87	87	89	87	90	88
1993	87	89	93	91	90	88	89	86	85	86	88	93	89
1994	103	108	110	111	114	104	97	110	108	109	113	121	109
1995	130	132	136	128	126	131	132	119	123	122	124	125	127
1996	126	125	127	130	127	127	121	119	118	118	115	114	122
1997	112	112	114	112	113	111	111	111	115	115	112	105	112
1998	101	103	105	105	105	115	112	109	111	110	107	100	107
						Tobacco 2/							
						1910-14=100							
1991	1557	1643	1526	1617			1422	1448	1552	1548	1583	1570	1547
1992	1552	1670	1517	1374			1361	1439	1587	1583	1591	1587	1526
1993	1574	1739	1604	1370			1370	1383	1496	1517	1574	1578	1521
1994	1596	1752	1478	1478			1309	1391	1539	1570	1609	1596	1532
1995	1630	1709	1491	1326			1526	1535	1591	1574	1600	1604	1559
1996	1652	1791	1517	1396			1391	1517	1643	1661	1674	1674	1592
1997	1678	1661	1678				1374	1387	1526	1552	1604	1670	1570
1998	1670	1665	1574	1474			1417	1413	1561	1622	1657	1665	1572
						1990-92=100							
1991	103	109	101	107			94	96	103	102	105	104	102
1992	103	110	100	91			90	95	105	105	105	105	101
1993	104	115	106	91			91	91	99	100	104	104	101
1994	105	116	98	98			86	92	102	104	106	105	101
1995	108	113	99	88			101	101	105	104	106	106	103
1996	109	118	100	92			92	100	109	110	111	111	105
1997	111	110	111				91	92	101	103	106	110	104
1998	110	110	104	97			94	93	103	107	109	110	104

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1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

2/ Missing data indicates insufficient sales volume to establish a price.

United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Oil-Bearing Crops							
						1910-14=100							
1991	561	556	564	564	554	544	524	551	539	524	511	517	542
1992	537	543	552	552	572	578	545	527	534	518	530	539	544
1993	546	545	553	560	568	577	641	639	598	582	620	652	590
1994	658	658	661	645	663	660	580	547	541	519	531	534	600
1995	534	527	539	543	543	556	577	569	568	586	619	653	568
1996	659	682	683	725	750	726	744	755	686	649	656	680	700
1997	695	719	775	801	817	792	731	700	620	615	655	656	715
1998	652	642	626	613	614	609	606	538	510	511	551	556	586
						1990-92=100							
1991	103	102	103	103	101	100	96	101	99	96	93	95	99
1992	98	99	101	101	105	106	100	96	98	95	97	98	100
1993	100	100	101	102	104	105	117	117	109	106	113	119	108
1994	120	120	121	118	121	121	106	100	99	95	97	98	110
1995	98	96	98	99	99	102	105	104	104	107	113	119	104
1996	120	125	125	132	137	133	136	138	125	119	120	124	128
1997	127	131	142	146	149	145	134	128	113	112	120	120	131
1998	119	117	114	112	112	111	111	98	93	93	101	102	107
						Fruit and Nuts							
						1910-14=100							
1991	678	706	749	774	810	933	784	780	862	807	775	725	782
1992	734	743	759	723	686	700	645	711	705	667	640	558	689
1993	500	501	481	511	564	677	706	786	845	833	741	602	646
1994	550	551	583	603	641	678	698	715	733	678	616	534	632
1995	515	514	533	569	708	730	773	885	822	790	692	629	680
1996	660	666	729	700	798	933	910	912	1006	979	872	717	824
1997	647	627	674	617	740	886	886	879	913	838	743	624	756
1998	558	602	653	709	773	842	902	931	891	860	800	649	764
						1990-92=100							
1991	97	101	107	111	116	134	112	112	123	116	111	104	112
1992	105	106	109	104	98	100	92	102	101	96	92	80	99
1993	72	72	69	73	81	97	101	113	121	119	106	86	93
1994	79	79	84	86	92	97	100	102	105	97	88	76	90
1995	74	74	76	81	101	105	111	127	118	113	99	90	97
1996	95	95	104	100	114	134	130	131	144	140	125	103	118

1997	93	90	97	88	106	127	127	126	131	120	106	89	108
1998	80	86	93	102	111	121	129	133	128	123	115	93	110

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Commercial Vegetables							
						1910-14=100							
1991	633	559	762	715	877	732	611	588	599	587	727	588	665
1992	648	789	961	706	623	631	679	757	771	836	731	812	745
1993	807	841	731	1112	856	677	710	741	757	642	696	851	785
1994	775	755	623	586	649	694	654	631	699	784	828	1094	731
1995	803	772	989	1161	1037	808	653	680	781	651	658	678	806
1996	631	742	986	818	691	774	661	775	679	727	747	643	740
1997	753	717	813	767	743	785	761	836	796	985	951	907	818
1998	801	749	804	981	841	704	792	744	743	883	752	746	795
						1990-92=100							
1991	95	84	114	107	131	109	91	88	90	88	109	88	100
1992	97	118	144	106	93	94	102	113	115	125	109	121	111
1993	121	126	109	166	128	101	106	111	113	96	104	127	117
1994	116	113	93	88	97	104	98	94	105	117	124	164	109
1995	120	116	148	174	155	121	98	102	117	97	98	101	121
1996	94	111	147	122	103	116	99	116	102	109	112	96	111
1997	113	107	122	115	111	118	114	125	119	147	142	136	122
1998	120	112	120	147	126	105	119	111	111	132	113	112	119
						Potatoes and Dry Beans							
						1910-14=100							
1991	483	481	529	595	665	619	664	460	394	368	367	381	501
1992	363	364	404	443	393	408	573	561	454	428	465	472	444
1993	477	477	528	601	599	540	621	532	474	469	593	562	539
1994	565	580	670	599	591	595	661	567	469	448	460	462	556
1995	466	450	484	505	529	612	729	586	497	539	548	547	541
1996	564	589	633	668	696	707	700	521	482	461	452	434	576
1997	426	431	433	433	477	431	499	544	440	433	457	477	457

1998	491	524	554	546	555	537	532	488	447	413	450	461	500
						1990-92=100							
1991	95	95	105	118	131	122	131	91	78	73	73	75	99
1992	72	72	80	88	78	81	113	111	90	85	92	93	88
1993	94	94	104	119	118	107	123	105	94	93	117	111	107
1994	112	115	132	118	117	118	131	112	93	89	91	91	110
1995	92	89	96	100	105	121	144	116	98	106	108	108	107
1996	111	116	125	132	138	140	138	103	95	91	89	86	114
1997	84	85	86	85	94	85	99	107	87	85	90	94	90
1998	97	104	109	108	110	106	105	96	88	82	89	91	99

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Other Crops							
						1910-14=100							
1991	478	478	478	478	478	478	478	478	478	478	478	478	478
1992	502	502	502	502	502	502	502	502	502	502	502	502	502
1993	510	510	510	510	510	510	510	510	510	510	510	510	510
1994	517	517	517	517	517	517	517	517	517	517	517	517	517
1995	525	525	525	525	525	525	525	525	525	525	525	525	525
1996	532	532	532	532	532	532	532	532	532	532	532	532	532
1997	532	532	532	532	532	532	532	532	532	532	532	532	532
1998	532	532	532	532	532	532	532	532	532	532	532	532	532
						1990-92=100							
1991	97	97	97	97	97	97	97	97	97	97	97	97	97
1992	102	102	102	102	102	102	102	102	102	102	102	102	102
1993	103	103	103	103	103	103	103	103	103	103	103	103	103
1994	105	105	105	105	105	105	105	105	105	105	105	105	105
1995	106	106	106	106	106	106	106	106	106	106	106	106	106
1996	108	108	108	108	108	108	108	108	108	108	108	108	108
1997	108	108	108	108	108	108	108	108	108	108	108	108	108
1998	108	108	108	108	108	108	108	108	108	108	108	108	108
						Food Commodities							

					1990-92=100								
1991	99	99	102	102	104	101	98	98	98	97	97	97	99
1992	96	99	100	98	98	99	99	101	100	98	98	97	99
1993	98	99	100	105	104	101	101	103	103	102	103	102	102
1994	102	102	103	100	99	98	96	97	96	94	94	96	98
1995	95	95	97	97	99	98	100	101	102	100	100	103	99
1996	102	101	105	102	106	113	113	113	113	111	109	106	108
1997	105	102	106	104	106	106	106	108	106	106	106	103	105
1998	100	98	100	103	102	101	101	102	100	100	100	98	100

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Livestock and Products							
						1910-14=100							
1991	775	774	781	770	764	758	761	750	744	749	729	732	757
1992	719	737	729	734	748	749	754	760	751	750	744	740	743
1993	755	760	778	784	791	785	766	769	766	756	755	746	768
1994	754	765	775	768	742	718	709	721	700	687	690	692	727
1995	711	721	711	687	675	689	694	708	717	706	722	737	707
1996	718	717	719	713	741	765	786	794	809	790	786	789	761
1997	753	751	761	761	766	747	763	761	756	741	753	748	755
1998	726	720	728	731	734	754	740	756	751	753	743	741	740
						1990-92=100							
1991	101	101	102	100	100	99	99	98	97	98	95	95	99
1992	94	96	95	96	97	98	98	99	98	98	97	96	97
1993	98	99	101	102	103	102	100	100	100	99	98	97	100
1994	98	100	101	100	97	94	92	94	91	89	90	90	95
1995	93	94	93	89	88	90	90	92	93	92	94	96	92
1996	94	93	94	93	97	100	102	104	105	103	102	103	99
1997	98	98	99	99	100	97	99	99	99	97	98	98	98
1998	95	94	95	95	96	98	96	99	98	98	97	97	97
						Meat Animals							

					1910-14=100								
1991	1067	1085	1098	1092	1085	1064	1039	993	971	974	922	911	1025
1992	921	976	971	980	992	982	976	987	972	974	955	960	971
1993	1009	1030	1056	1054	1058	1037	1005	1014	1002	975	957	936	1011
1994	967	990	997	986	933	884	883	913	854	836	839	841	910
1995	907	931	902	856	835	859	861	865	866	840	834	854	868
1996	832	839	841	820	853	869	907	923	936	920	918	920	882
1997	913	918	937	956	982	952	963	952	935	910	899	881	933
1998	851	831	834	856	888	873	808	792	745	765	728	674	804
					1990-92=100								
1991	105	107	108	107	107	105	102	98	96	96	91	90	101
1992	91	96	96	96	98	97	96	97	96	96	94	94	96
1993	99	101	104	104	104	102	99	100	99	96	94	92	100
1994	95	97	98	97	92	87	87	90	84	82	83	83	90
1995	89	92	89	84	82	85	85	85	85	83	82	84	85
1996	82	82	83	81	84	85	89	91	92	91	90	90	87
1997	90	90	92	94	97	94	95	94	92	89	88	87	92
1998	84	82	82	84	87	86	80	78	73	75	72	66	79

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Indexes of Prices Received by Months and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Dairy Products							
						1910-14=100							
1991	719	713	701	694	694	701	725	762	787	830	854	848	752
1992	823	793	768	774	787	811	823	830	830	823	805	787	805
1993	768	750	750	774	793	799	787	762	787	805	836	830	787
1994	836	823	830	823	787	774	750	762	787	799	805	787	797
1995	774	768	774	756	756	744	737	762	787	823	860	854	783
1996	866	854	848	854	879	910	946	977	1014	1008	934	879	914
1997	830	823	836	811	780	750	744	780	805	866	903	910	820
1998	903	910	891	860	817	866	873	953	1032	1094	1094	1112	950
						1990-92=100							
1991	90	89	87	87	87	87	90	95	98	103	106	106	94

1992 :	103	99	96	96	98	101	103	103	103	103	100	98	100
1993 :	96	93	93	96	99	100	98	95	98	100	104	103	98
1994 :	104	103	103	103	98	96	93	95	98	100	100	98	99
1995 :	96	96	96	94	94	93	92	95	98	103	107	106	98
1996 :	108	106	106	106	109	113	118	122	126	126	116	109	114
1997 :	103	103	104	101	97	93	93	97	100	108	113	113	102
1998 :	113	113	111	107	102	108	109	119	129	136	136	139	119
:													
:	Poultry and Eggs												
:													
:	1910-14=100												
:													
1991 :	287	277	290	279	273	275	286	286	283	274	268	277	280
1992 :	262	258	258	258	271	270	280	283	277	280	291	281	272
1993 :	278	278	294	298	299	300	295	305	299	299	301	294	295
1994 :	289	294	302	300	310	308	304	300	301	294	290	287	298
1995 :	283	280	282	281	274	284	296	315	324	319	336	328	300
1996 :	329	318	315	315	326	344	343	345	346	341	355	361	337
1997 :	335	325	318	313	314	313	333	330	325	303	314	301	319
1998 :	299	292	305	305	304	326	346	369	361	353	348	336	329
:													
:	1990-92=100												
:													
1991 :	102	98	103	99	97	98	102	102	100	97	95	99	99
1992 :	93	92	92	92	96	96	100	101	98	100	103	100	97
1993 :	99	99	105	106	106	107	105	108	106	106	107	105	105
1994 :	103	104	107	107	110	110	108	107	107	104	103	102	106
1995 :	101	100	100	100	97	101	105	112	115	113	119	117	107
1996 :	117	113	112	112	116	122	122	123	123	121	126	128	120
1997 :	119	116	113	111	112	111	118	117	116	108	112	107	113
1998 :	106	104	108	109	108	116	123	131	128	126	124	119	117

1/ Simple average required for parity regulations. Weighted 1990-92 average equals 100.

Marketing Years

Field Crops

Barley: June-May for CA; July-June for all other estimated States.

Canola: June-May, U. S. only.

Dry Edible Beans: September-August for all estimated States.

Corn for Grain: August-July for GA, LA, MS, and TX; September-August for IL, IN, IA, KS, KY, MO, NC, and OH; October-September for all other estimated States.

Cotton: August-July for all States.

Cottonseed: August-February for all States.

Flaxseed: July-June for all estimated States.

Hay: April-March for AZ; May-April for AR, CA, GA, KS, KY, MO, NV, NM, OK,
TX, and UT; June-May for all other estimated States.

Mustard Seed: September-August, U. S. only.

Oats: May-April for TX; June-May for CA, July-June for all other estimated
States.

Peanuts: August-February for all States.

Potatoes: The marketing year extends over a 21 month period beginning in November preceding the specified crop year and extending into July
the following year. November (previous year)-May for winter crop potatoes;
April-August for spring crop potatoes; June-December for summer crop potatoes;
July-July (following year) for fall potatoes.

Rapeseed: June-May, U. S. only.

Rice: July-June for LA and TX; August-July for AR and MS; October-September
for CA.

Safflower: September-August, U. S. only.

Sorghum for Grain: June-May for TX; August-July for AR and OK; September-
August for IL, KS, MO, and SD; October-September for NE.

Soybeans: September-August for all estimated States.

Sunflower: September-August for all estimated States.

Tobacco: July-November for flue-cured, types 11-14; November-April for fire-cured, types 21-23; November-February for Burley, type 31, and
dark air-cured, types 35-37; March-May following the year of production for
Southern MD, type 32.

Wheat: May-April for AZ, CA, GA, OK, and TX; June-May for AR, IL, IN, KS, and
MO; July-June for all other estimated States.

Fruit

Apples (Fresh): June-May for most South Atlantic, Southeastern, and Central States, plus CA; July-June for all other States except OR and WA where most of the crop is marketed August-July.

Marketing Years (Con't)

Oranges: October-March for AZ Navel; January-July for AZ Valencias; October-June for CA Navel; March-December for CA Valencias; November-March for FL early and mid-season; March-June for FL Valencias; October-February for TX early and mid-season; January-April for TX Valencias.

Grapefruit: October-July for AZ; November-July for CA Desert; March-September for CA Other Areas; October-June for FL; October-May for TX.

Lemons: September-May for AZ; August-July for CA.

Limes: April-March for FL.

Tangelos: November-February for FL.

Tangerines: October-May for AZ; November-June for CA; October-April for FL.

Temples: January-April for FL.

Vegetables

Asparagus: January-October for CA; May-July for MI; April-July for WA.

Carrots: January-December for CA; July-December for MI and WA; December-May for TX.

Celery: January-June and November-December for CA Southern-Coast and FL; May-December for CA Central-Coast; July-October for MI and NY.

Onions: April-July for spring; May-September for summer (non-storage); July-April for summer (storage).

Sweet Corn: April-October for CA; January-July and October-December for FL;
June-October for all other monthly states.

Tomatoes: May-November for CA; January-June and October-December for FL;
April-July and November-January for TX; June-October for all other
monthly states.

Livestock, Livestock Products and Poultry

Cattle: January-December.

Hogs: December-November.

Sheep: January-December.

Broilers: December-November.

Eggs: December-November.

Turkeys: January-December.

Honey: April-March.

Mohair: January-December.

Wool: January-December.

Field Crops: Farm Marketings, Percent of Sales by Crop and Month, United States, 1996-97 and 1997-98

Month	Crop Marketing Year					
	1996-97	1997-98	1996-97	1997-98	1996-97	1997-98
	Percent					
	Corn		Sorghum		Soybeans	
Sep	4.0	6.2	3.3	10.1	3.9	6.3
Oct	11.4	14.1	12.5	15.9	21.0	22.8
Nov	13.2	11.3	14.5	15.7	10.4	8.9
Dec	8.0	8.1	12.3	12.1	7.2	8.8

Jan	:	15.1	14.8	12.2	14.7	17.8
12.3						
Feb	:	9.8	6.7	7.9	4.8	8.3
7.2						
Mar	:	8.0	7.4	5.9	4.9	7.9
6.0						
Apr	:	6.1	5.2	4.0	2.8	6.1
6.1						
May	:	4.8	5.3	3.6	3.3	4.4
5.2						
Jun	:	5.6	7.4	3.9	5.3	3.9
6.3						
Jul	:	6.7	6.2	7.8	5.6	4.3
5.6						
Aug	:	7.3	7.3	12.1	4.8	4.8
4.5						
	:					
Year	:	100.0	100.0	100.0	100.0	100.0
100.0						
	:					
	:	Flaxseed		Cotton		Peanuts
	:					
Jul	:	2.7	2.8			
Aug	:	4.9	8.9	3.7	2.6	
Sep	:	17.3	36.9	3.8	4.1	27.6
34.4						
Oct	:	24.9	21.5	12.7	11.0	57.9
43.1						
Nov	:	10.8	8.6	19.6	17.1	11.5
15.8						
Dec	:	8.6	3.5	15.0	16.2	2.1
5.4						
Jan	:	18.2	4.3	17.5	13.7	.8
1.2						
Feb	:	1.9	3.1	9.8	11.6	.1
.1						
Mar	:	4.0	4.3	5.6	9.7	
Apr	:	2.1	2.4	3.0	4.1	
May	:	2.4	1.7	3.6	3.8	
Jun	:	2.2	2.0	3.6	3.7	
Jul	:			2.1	2.4	
	:					
Year	:	100.0	100.0	100.0	100.0	100.0
100.0						
	:					
	:	Dry Beans				
Sunflower						
	:					
Sep	:	20.3	12.8			2.1
4.3						
Oct	:	21.4	15.9			21.2
20.9						
Nov	:	7.9	11.0			11.7
18.1						

Dec	7.5	11.6			9.6	11.3
Jan	8.0	10.4			10.1	11.1
Feb	5.2	7.8			8.0	6.9
Mar	4.5	6.1			7.1	11.4
Apr	5.4	5.9			6.1	6.9
May	5.8	4.5			5.6	3.1
Jun	6.3	4.2			5.0	3.6
Jul	4.1	4.5			9.5	1.3
Aug	3.6	5.3			4.0	1.1
Year	100.0	100.0			100.0	100.0

Field Crops: Farm Marketings, Percent of Sales by Crop and Month, United States, 1996-97 and 1997-98

Month	Crop Marketing Year					
	1996-97	1997-98	1996-97	1997-98	1996-97	1997-98
	Percent					
	Oats		Wheat		Barley	
Jun	5.0	5.1	7.5	9.2	4.0	6.5
Jul	18.3	14.0	13.3	20.4	6.9	6.7
Aug	33.4	33.2	10.4	12.4	17.5	17.0
Sep	10.8	10.8	9.3	7.6	21.2	17.2
Oct	4.2	4.7	6.6	4.9	6.8	9.5
Nov	2.7	3.0	5.5	4.6	6.5	8.0

Dec	3.4	3.9	9.2	8.1	7.1	10.0
Jan	4.2	5.0	10.6	8.7	8.7	7.5
Feb	4.8	6.3	8.6	5.4	6.7	5.7
Mar	4.3	5.6	8.5	6.6	6.4	5.3
Apr	4.7	5.2	7.0	5.9	4.4	3.8
May	4.2	3.2	3.5	6.2	3.8	2.8
Year	100.0	100.0	100.0	100.0	100.0	100.0

	Hay	
Apr	.3	.5
May	3.8	4.7
Jun	10.4	10.5
Jul	11.2	11.7
Aug	10.2	10.4
Sep	9.6	9.7
Oct	8.2	9.8
Nov	8.0	8.5
Dec	8.7	8.1
Jan	8.4	7.5
Feb	6.9	5.7
Mar	6.6	5.9
Apr	5.8	4.7
May	1.9	2.3
Year	100.0	100.0

Barley: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Percent												
CA 1996-97	36	25	6	3	3	2	2	3	1	2	4	13	
1997-98	30	10	6	7	1		1	1	1	9	7	27	

		:											
CO	1996-97	:	9	39	15	8	4	16	5		2	1	
1													
	1997-98	:	11	27	33	17	4	1	2	1	1	2	
1													
		:											
ID	1996-97	:	7	14	19	6	12	11	10	5	7	3	1
5													
	1997-98	:	3	17	17	8	10	13	10	7	6	4	3
2													
		:											
MN	1996-97	:	6	14	14	4	6	7	11	12	8	7	5
6													
	1997-98	:	15	19	19	10	4	9	3	4	2	2	3
10													
		:											
MT	1996-97	:	5	13	16	10	9	13	11	9	5	4	2
3													
	1997-98	:	5	9	12	13	14	15	9	9	7	4	1
2													
		:											
ND	1996-97	:	6	16	23	5	5	5	8	6	8	5	5
8													
	1997-98	:	10	20	15	8	6	10	8	5	6	4	2
6													
		:											
OR	1996-97	:	7	12	13	12	9	8	9	8	5	8	8
1													
	1997-98	:	6	15	27	8	9	3	13	4	1	4	4
6													
		:											
SD	1996-97	:	21	18	7	9	5	8	1	6	7	5	3
10													
	1997-98	:	8	14	13	7	9	9	9	8	7	5	4
7													
		:											
UT	1996-97	:	16	24	10	11	6	1	6	5	4	3	9
5													
	1997-98	:	6	21	10	9	7	8	6	5	5	8	8
7													
		:											
WA	1996-97	:	5	19	21	15	9	6	11	3	5	3	2
1													
	1997-98	:	1	16	27	15	8	8	5	5	4	4	3
4													
		:											
WY	1996-97	:	9	39	44	4	1	1		1	1		
	1997-98	:	9	45	30	5	2	3	2	2	1	1	

1/ Sample survey reported marketings as percent of total used for calculating
marketing year average prices.

Oats: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
						Percent								
IL 1996-97:	14	43	7	7	1	2	10	1	4	4	3	4		
1997-98:	38	37	9	9			1	3		1	2			
IA 1996-97:	26	48	7	4	1	1	1	2	3	2	2	3		
1997-98:	26	43	6	2	1	3	3	3	3	4	3	3		
MI 1996-97:	11	33	10	4	1	2	3	6	5	5	5	15		
1997-98:	7	39	7	2	2	2	1	4	11	15	4	6		
MN 1996-97:	18	30	12	4	4	3	4	4	4	7	6	4		
1997-98:	7	44	12	4	1	3	3	3	6	6	3	8		
MT 1996-97:	8	14	22	3	13	12	2	5	6	13	2			
1997-98:	9	28	17	8	3	2	12	12	5	1	3			
NE 1996-97:	42	27	8	2	3	2	3	4	2	1	2	4		
1997-98:	45	22	6	3	8	1	4	3	1	4	2	1		
ND 1996-97:	10	27	20	6	4	5	6	6	5	3	2	6		
1997-98:	6	25	17	7	7	8	6	5	7	6	2	4		
OH 1996-97:	25	37	7	2	4	1		4	5	5	7	3		

	1997-98:		5	39	10	6	2	4	4	7	10	5	5	3
OR	1996-97:			11	20	8	12	4	16	3	14	6	3	3
	1997-98:			18	10	7	7	3	9	38	3	3	2	
PA	1996-97:		12	27	4	2	2	5	9	11	14	3	5	6
	1997-98:		18	26	4	8	3	2	6	4	10	7	8	4
SD	1996-97:		19	34	5	4	1	5	1	6	4	6	6	9
	1997-98:		13	32	10	4	2	4	8	5	9	6	3	4
TX	1996-97:	83	11	6										
	1997-98:	13	7	9	36		13	5	6	4	3	4		
WI	1996-97:		12	39	6	5	3	2	6	5	4	8	6	4
	1997-98:			7	37	19	6	2	4	4	3	3	6	4	5

1/ Sample survey reported marketings as percent of total used for calculating marketing year average prices.

All Wheat: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
						Percent								
AR 1996-97	58	23	7	2	3	1	1	2	1	1	1	2		
1997-98	60	14	12	4	1	1	2	1	2	1				
CA 1996-97	10	32	25	9	4	2	2	2	3	1	5	5		
1997-98	12	34	24	7	3	5	1	2	3	1	5	3		

CO	1996-97	:		12	9	7	6	6	11	16	11	11	8
2	1												
	1997-98	:		9	8	5	3	2	7	29	7	10	8
6	6												
		:											
ID	1996-97	:		1	6	13	7	5	14	14	11	11	8
5	5												
	1997-98	:		2	9	16	12	6	13	9	7	7	5
7	7												
		:											
IL	1996-97	:	7	53	16	4	1	1	2	4	2	3	5
2													
	1997-98	:	5	46	17	5	1	1	2	4	4	5	7
3													
		:											
IN	1996-97	:	8	59	16	10	1		1	1	2	1	1
	1997-98	:	9	62	18	5			2	1	1	1	1
		:											
KS	1996-97	:	10	33	7	6	4	5	8	8	6	7	4
2													
	1997-98	:	7	34	10	4	4	4	7	8	5	6	6
5													
		:											
MI	1996-97	:		27	39	8	3	1	3	7	3	4	4
1													
	1997-98	:		20	27	7	3	25	3	3	5	2	2
2	1												
		:											
MN	1996-97	:		3	17	14	7	6	10	11	7	9	10
3	3												
	1997-98	:		7	18	11	3	4	11	6	5	8	6
7	14												
		:											
MO	1996-97	:	11	43	9	4	3	3	3	6	6	7	4
1													
	1997-98	:	3	56	12	6	2	2	2	6	4	3	2
2													
		:											
MT	1996-97	:		3	5	7	6	8	14	14	11	9	10
6	7												
	1997-98	:		5	5	8	8	6	13	11	10	12	8
8	6												
		:											
NE	1996-97	:		21	13	7	5	6	10	11	10	7	6
2	2												
	1997-98	:		21	17	7	3	2	5	10	8	12	5
5	5												
		:											
ND	1996-97	:		4	6	13	8	7	10	12	10	10	9
4	7												
	1997-98	:		9	11	10	6	7	12	8	5	9	9
7	7												
		:											

OH	1996-97	:		44	12	11	4	2	4	6	6	5	4
1	1												
	1997-98	:		47	24	4	1	2	2	4	2	2	2
2	8												
		:											
OK	1996-97	:	9	25	10	6	5	5	6	9	8	6	8	3
	1997-98	:	1	26	25	10	4	3	3	6	8	5	5	4
		:												
OR	1996-97	:			5	15	13	12	8	10	9	12	7	5
2	2													
	1997-98	:			5	15	15	7	7	12	15	6	4	4
5	5													
		:												
SD	1996-97	:			6	25	7	5	3	6	11	10	10	9
4	4													
	1997-98	:			9	24	9	4	3	7	10	6	7	6
6	9													
		:												
TX	1996-97	:	16	28	21	6	3	7	3	4	5	2	3	2
	1997-98	:	3	33	39	6	3	1	1	3	4	2	3	2
		:												
WA	1996-97	:			3	12	10	11	6	11	13	12	9	7
4	2													
	1997-98	:			1	14	14	11	8	12	11	5	7	6
5	6													

1/ Sample survey reported marketings as percent of total used for calculating
marketing year average prices.

Hay: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
							Percent							
AZ	1996-97	10	15	13	11	10	9	9	6	4	3	4	6	
	1997-98	14	16	11	13	8	6	6	7	4	3	3	9	
CA	1996-97		12	12	14	15	10	8	5	3	3	4	4	10
	1997-98		13	12	14	13	11	15	7	3	3	2	4	3

	:												
CO	1996-97:		9	10	10	12	13	10	8	12	5	5	4
	1997-98:		6	6	14	10	11	10	8	8	7	9	5
	:												
ID	1996-97:		10	9	10	15	8	12	9	6	7	6	4
	1997-98:		10	9	10	15	8	12	9	6	7	6	4
	:												
IL	1996-97:		10	8	8	6	4	6	9	14	13	13	6
	1997-98:		16	11	10	7	4	5	7	11	10	9	6
	:												
IA	1996-97:		10	11	9	8	5	7	9	12	9	10	6
	1997-98:		10	11	9	8	5	7	9	11	9	10	7
	:												
KS	1996-97:	2	6	6	5	5	7	14	20	21	6	5	3
	1997-98:	2	6	6	5	5	7	14	20	21	6	5	3
	:												
KY	1996-97:	5	13	10	9	9	8	6	13	11	9	5	2
	1997-98:	5	13	10	9	9	8	7	13	11	8	5	2
	:												
MI	1996-97:		11	9	6	3	6	4	7	8	14	15	12
	1997-98:		13	13	9	6	6	12	12	8	6	7	5
	:												
MN	1996-97:		8	11	10	11	7	2	6	8	9	14	5
	1997-98:		9	8	6	5	6	8	9	10	11	12	11
	:												
MO	1996-97:	2	12	11	10	8	4	8	11	9	11	9	5
	1997-98:	4	15	14	6	6	4	8	8	10	13	9	3
	:												
MT	1996-97:		5	13	10	15	15	11	10	8	6	3	3
	1997-98:		8	11	11	9	10	11	10	9	7	7	4
	:												
NE	1996-97:		7	4	2	10	12	6	18	11	9	10	6

	1997-98:	9	10	9	8	10	8	12	10	8	8	6	2
NV	1996-97:	2	6	12	13	14	10	9	8	7	7	7	5
	1997-98:	3	3	10	12	11	12	11	10	9	8	7	4

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continued

Hay: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/ (continued)

State and Marketing Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
	Percent													
NM	1996-97:	10	17	17	13	11	9	6	4	4	3	3	3	
	1997-98:	14	16	14	13	12	9	5	4	4	4	3	2	
NY	1996-97:	9	12	7	7	7	8	9	9	8	11	7	6	
	1997-98:	17	14	7	4	4	6	8	9	9	10	7	5	
ND	1996-97:	3	4	6	11	7	17	15	8	5	11	9	4	
	1997-98:	5	10	9	14	14	11	7	7	5	7	7	4	
OH	1996-97:	20	12	9	7	7	6	7	7	6	6	7	6	
	1997-98:	14	11	8	8	6	8	10	9	8	8	6	4	
OK	1996-97:	6	12	12	15	7	7	6	7	7	9	8	4	
	1997-98:	7	13	21	9	9	9	6	8	7	5	4	2	

OR	1996-97:		6	13	11	11	8	9	9	10	8	6	5	4
	1997-98:		13	15	13	11	12	7	7	5	6	6	3	2
	:													
PA	1996-97:		7	12	6	7	5	5	11	13	12	11	6	5
	1997-98:		11	11	5	5	6	9	9	10	10	10	8	6
	:													
SD	1996-97:		3	8	7	7	8	10	11	15	13	10	6	2
	1997-98:		11	12	5	11	13	7	6	7	5	10	8	5
	:													
TX	1996-97:	6	13	11	10	9	7	8	9	8	8	8	3	
	1997-98:	6	10	11	12	9	10	9	9	9	6	5	4	
	:													
UT	1996-97:	3	10	15	10	12	11	8	7	7	6	5	6	
	1997-98:	2	10	12	18	13	9	7	10	7	4	4	4	
	:													
WA	1996-97:		17	18	13	12	9	7	5	5	3	5	3	3
	1997-98:		11	11	12	12	9	8	7	7	6	6	5	6
	:													
WI	1996-97:		14	10	10	6	5	7	8	8	8	9	9	6
	1997-98:		19	15	16	10	4	2	7	7	5	4	6	5
	:													
WY	1996-97:		3	6	10	9	11	15	16	16	8	4	1	1
	1997-98:		3	9	11	11	10	17	13	9	6	5	4	2

1/ Percents use to calculate marketing year average prices.

Corn: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

Year												
					Percent							
CO 1996-97	16	13	10	15	10	7	6	5	5	5	4	4
1997-98	11	10	11	13	6	7	4	4	13	13	4	4
GA 1996-97	38	27	7	2	3	4	4	4	3	3	2	3
1997-98	32	26	10	3	3	5	4	6	2	3	2	4
IL 1996-97	2	12	10	7	21	12	9	7	4	5	5	6
1997-98	3	14	6	5	19	8	9	5	7	8	8	8
IN 1996-97	5	13	19	7	14	10	8	6	4	4	5	5
1997-98	2	16	20	15	12	7	5	4	4	5	5	5
IA 1996-97	2	8	13	6	14	10	9	7	5	7	10	9
1997-98	7	14	10	5	14	7	8	6	6	8	7	8
KS 1996-97	7	22	13	13	15	9	8	4	3	2	2	2
1997-98	7	22	11	14	14	4	5	3	5	5	4	6
KY 1996-97	21	19	7	4	19	10	6	4	3	2	2	3
1997-98	17	19	6	3	17	7	8	7	4	3	3	6
MI 1996-97	5	22	12	15	9	6	5	3	5	6	6	6
1997-98	5	20	19	16	9	7	5	5	4	3	3	4
MN 1996-97	10	13	7	10	8	7	7	7	7	9	9	6
1997-98	14	9	6	8	6	5	4	7	14	8	10	9
MO 1996-97	16	14	9	10	14	8	7	4	4	5	4	5
1997-98	9	16	10	7	17	8	7	5	5	7	4	5
NE 1996-97	10	14	10	14	9	9	6	5	5	7	7	4
1997-98	14	10	8	15	7	8	5	4	6	5	9	9
NC 1996-97	41	23	7	2	5	4	4	3	2	2	2	5
1997-98	41	21	4	6	3	3	2	2	2	3	2	11
OH 1996-97	1	8	17	13	17	11	9	6	4	5	5	4
1997-98	3	10	20	12	14	7	8	6	4	7	4	5

PA	1996-97			15	26	12	5	6	6	4	5	4	4	4
9														
	1997-98			9	16	12	14	4	4	7	3	5	5	7
14														
SD	1996-97			6	12	5	5	5	5	5	4	11	16	14
12														
	1997-98			19	18	7	11	8	8	8	7	4	3	3
4														
TX	1996-97	9	24	32	6	4	9	3	3	1	1	1	7	
	1997-98	16	17	20	8	7	11	3	4	1	2	3	8	
WI	1996-97			6	20	11	10	7	8	8	6	7	7	6
4														
	1997-98			6	21	11	15	6	8	6	5	7	5	6
4														

1/ Sample Survey reported marketings as percent of total used for calculating marketing year average prices.

Sorghum: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
							Percent									
AR 1996-97			30	37	21	1	5	3	1	1	1					
1997-98			8	44	34	5	3	1	3	1			1			
IL 1996-97					15	56	9	6	5	6		2	1			
1997-98				7	17	21	7	18	5	3	2	3	4	5	8	
KS 1996-97				2	19	20	14	14	9	7	3	3	3	2	4	
1997-98				6	18	15	14	18	5	6	4	5	3	3	3	
MO 1996-97				4	25	14	14	12	6	7	5	2	2	4	5	
1997-98				9	24	18	6	14	4	4	3	3	10	2	3	
NE 1996-97					7	10	13	13	11	9	8	8	9	8	2	2
1997-98					16	15	13	18	8	7	3	3	7	2	3	5
OK 1996-97			1	5	14	20	21	15	8	5	4	2	3	2		
1997-98			8	8	7	20	20	20	5	5	3	2	1	1		

TX	1996-97	9	20	18	4	5	10	11	11	6	3	2	1
	1997-98	1	17	34	12	8	12	6	6	2	1		1

1/ Sample survey reported marketings as percent of total used for calculating marketing year average prices.

Flaxseed: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
ND	1996-97	3	3	17	25	11	9	19	2	4	2	3	2
	1997-98	3	9	36	22	9	4	4	3	4	2	2	2
SD	1996-97	6	35	28	22	1			2	2	2	2	
	1997-98		15	52	12	2	1	15		1	1		1

1/ Percents reflect crop marketings reported by surveyed firms.

Soybeans: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
						Percent							
AR	1996-97	2	25	22	14	21	6	4	3	1	1		1
	1997-98	3	26	26	12	10	6	4	4	3	2	2	2
GA	1996-97	1	23	39	24	5	2	4	2				
	1997-98	1	8	32	37	8	4	2	3	2	3		

IL	1996-97	4	14	5	6	22	10	11	6	5	4	5
8												
	1997-98	6	16	3	5	18	9	8	7	7	8	7
6												
IN	1996-97	5	25	20	6	14	6	6	5	4	3	3
3												
	1997-98	8	28	4	24	8	5	4	4	3	5	4
3												
IA	1996-97	4	21	4	4	17	9	9	8	5	5	7
7												
	1997-98	6	22	8	4	12	7	7	7	7	7	7
6												
KS	1996-97	2	27	9	10	19	7	9	4	2	3	4
4												
	1997-98	5	19	12	11	12	9	9	8	6	4	3
2												
KY	1996-97	1	6	25	9	29	13	6	5	2	1	1
2												
	1997-98	2	11	18	9	18	12	8	8	5	3	3
3												
LA	1996-97	17	41	16	5	13	3	1				1
3												
	1997-98	24	38	11	5	13	3	2	2			1
1												
MI	1996-97	2	34	15	8	15	6	6	4	2	1	4
3												
	1997-98	1	31	19	8	8	7	5	4	4	5	4
4												
MN	1996-97	6	25	5	6	14	7	7	8	7	5	5
5												
	1997-98	8	19	6	6	8	7	6	5	6	12	10
7												

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continued

Soybeans: Farm Marketings, Percent of Sales,
by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

MS	1996-97	7	16	13	12	34	7	4	2	1	2
	1997-98	14	27	9	8	17	7	5	2	2	1	6
MO	1996-97	3	20	9	9	20	11	10	5	4	3	2
	1997-98	3	22	13	6	15	8	7	6	6	6	4
NE	1996-97	3	21	6	7	16	9	8	7	6	6	7
	1997-98	7	17	8	7	15	9	6	7	5	6	7
NC	1996-97	1	9	29	21	19	7	7	3	1		1
	1997-98	1	2	33	31	9	4	4	3	5	4	2
OH	1996-97	3	22	15	6	17	9	8	7	4	3	3
	1997-98	6	30	8	6	10	7	6	7	5	7	5
SD	1996-97	2	29	6	11	8	8	5	5	4	7	9
	1997-98	6	38	7	6	8	7	6	8	4	4	4
TN	1996-97	2	16	37	19	12	5	4	2	1	1	
	1997-98	10	22	22	11	15	5	5	3	2	2	2
WI	1996-97	2	30	11	6	14	7	7	7	5	4	4
	1997-98	3	31	12	5	12	7	5	6	6	6	5

1/ Percents reflect crop marketings reported by surveyed firms.

Sunflower: Farm Marketings, Percent of Sales
by Month and State, 1996-97 and 1997-98 1/

State and											

Marketing Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
KS 1996-97:	3	38	13	7	12	8	6	8	3	2		
1997-98:	3	23	22	22	12	7	6	3	2			
MN 1996-97:	5	12	11	11	12	11	9	12	13	2	1	1
1997-98:	18	11	6	16	6	6	10	11	2	4	5	5
ND 1996-97:	2	16	14	9	11	7	8	5	5	8	9	6
1997-98:	3	19	20	12	10	7	13	7	2	4	2	1
SD 1996-97:	1	26	9	12	8	7	5	6	4	3	15	4
1997-98:	5	26	13	6	15	7	10	7	5	4	1	1

Dry Edible Beans: Farm Marketings, Percent of Sales, by Month and State, 1996-97 and 1997-98 1/

State and Marketing Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
CA 1996-97	6	12	12	11	8	8	7	9	10	6	6	5
1997-98	6	11	13	9	8	7	7	9	10	7	7	6
CO 1996-97	27	17	4	6	8	4	4	3	4	9	7	7
1997-98	15	23	9	7	8	5	3	5	6	7	6	6
ID 1996-97	10	15	12	10	10	8	8	7	6	7	4	3

	1997-98	10	14	12	10	11	8	8	7	6	7	4 3
MI	1996-97	6	32	8	6	15	6	3	6	3	7	5 3
	1997-98	5	16	11	16	11	10	6	6	5	5	5 4
MN	1996-97	34	19	7	3	3	2	3	5	10	8	4 2
	1997-98	21	19	13	7	7	7	5	3	3	4	4 7
NE	1996-97	29	18	10	7	7	4	5	4	4	5	2 5
	1997-98	20	14	9	10	17	5	6	6	3	2	5 3
ND	1996-97	27	25	6	8	5	4	4	5	6	5	3 2
	1997-98	17	16	13	12	8	8	6	5	2	3	3 7

1/ Percents reflect estimates of actual marketings used for calculating marketing year average prices.

Upland Cotton: Farm Marketings, Percent of Sales by Month, State and U.S., 1996-97 and 1997-98 1/

State and Marketing Year	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	Percent											
AL												
1996-97	0.5	0.4	14.1	12.5	21.5	27.0	3.1	1.1	1.1	16.7	1.0	1.0
1997-98	3.4	1.9	11.5	20.4	23.8	8.8	12.0	3.6	4.0	3.3	5.3	2.1

AZ :
1996-97: 1.9 10.5 9.8 21.5 11.0 24.9 5.7 8.0 4.3 1.7 0.8
2/
1997-98: 2.8 6.3 18.9 15.0 9.6 9.7 8.9 6.5 2.0 1.2 10.2
8.9
:
AR :
1996-97: 1.6 3.2 32.6 27.1 9.2 5.7 7.0 2.6 2.9 2.9 2.5
2.8
1997-98: 4.2 3.1 10.1 18.6 12.7 7.9 16.8 8.6 6.2 5.2 3.7
2.9
:
CA :
1996-97: 2.9 3.0 14.3 14.3 13.0 19.8 10.0 7.4 4.9 4.4 3.2
2.7
1997-98: 0.3 6.2 13.9 19.6 14.8 10.3 7.8 11.2 7.5 3.1 3.5
1.8
:
GA :
1996-97: 0.2 1.8 12.8 21.1 22.0 18.2 6.9 5.8 2.7 2.6 4.4
1.5
1997-98: 1.8 0.6 14.4 18.2 26.1 14.5 8.5 7.4 1.8 3.0 3.0
0.8
:
LA :
1996-97: 2.0 2.5 12.7 17.6 9.8 9.3 9.1 11.7 5.4 6.2 7.6
6.1
1997-98: 3.8 3.5 20.8 19.8 10.0 10.2 10.7 8.3 5.3 3.2 2.4
1.9
:
MS :
1996-97: 4.2 3.4 11.7 18.2 9.4 8.6 12.7 6.7 4.9 5.4 9.4
5.3
1997-98: 5.1 5.2 6.5 13.0 8.8 13.7 15.5 12.0 5.7 5.4 4.7
4.4
:
NC :
1996-97: 0.7 0.4 11.4 26.9 15.5 17.5 9.5 6.3 2.5 3.6 5.0
0.7
1997-98: 0.1 0.2 4.0 19.9 20.3 8.2 12.4 27.6 1.8 1.2 3.9
0.2
:
TN :
1996-97: 0.9 2.3 20.0 28.9 11.1 4.4 5.1 2.4 5.1 7.2 10.2
2.4
1997-98: 3.7 1.5 15.3 22.6 16.8 3.5 10.8 10.6 6.0 3.8 4.5
0.9
:
TX :
1996-97: 8.4 6.0 6.9 18.7 16.1 22.6 13.4 4.0 1.2 1.3 0.9
0.6
1997-98: 2.7 5.2 6.4 14.7 17.5 21.1 13.0 7.8 2.5 4.9 2.3
2.0
:

US :											
1996-97:	3.7	3.8	12.7	19.6	15.0	17.5	9.8	5.6	3.0	3.6	3.6
2.1											
1997-98:	2.6	4.1	11.0	17.1	16.2	13.7	11.6	9.7	4.1	3.8	3.7
2.4											

1/ Percents reflect estimates of actual marketings used for calculating marketing year averages.
2/ Insufficient sales.

Upland Cotton Monthly Marketings, Calendar Years, 1996-98
and Rice Monthly Marketings, Marketing Years, 1995/96 - 1997/98

Month	Upland Cotton 1/			Month	Rice 2/		
	1996	1997	1998		1995/96	1996/97	1997/98
	1,000 Bales				1,000 Cwt		
Jan	2,265	2,810	1,881	Aug	10,149	10,684	8,478
Feb	757	1,574	1,585	Sep	11,743	13,705	14,411
Mar	716	900	1,321	Oct	12,343	12,382	12,216
Apr	559	485	558	Nov	12,941	12,067	11,705
May	343	576	523	Dec	13,506	13,181	14,434
Jun	304	585	504	Jan	13,405	16,520	12,593
Jul	331	331	332	Feb	12,235	12,266	11,739
Aug	593	355	388	Mar	14,690	10,303	12,151
Sep	613	559	423	Apr	13,279	11,083	10,434
Oct	2,042	1,507	923	May	11,702	8,381	12,220
Nov	3,156	2,341	1,643	Jun	10,275	7,493	10,927
Dec	2,411	2,215	1,611	Jul	10,782	9,632	8,611
Year	14,090	14,238	11,692	Year	147,050	137,697	139,919

1/ Marketings August through December 1998 are preliminary. Survey expanded marketings based on buyer purchases in the major cotton producing States- AL, AZ, AR, CA, GA, LA, MS, TN and TX.

2/ Purchases from producers as reported by private firms and rice (rough equivalent) shipped from producers as reported by cooperative mills.

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary

State	Barley						Dry Edible Beans	
	All		Feed		Malting			
	1997	1998	1997	1998 1/	1997	1998 1/	1997	1998
	Dollars per Bu						Dollars per Cwt	
AL								
AK	3.20	3.60						
AZ	2.90	2.90						
CA	2.75	2.25	2.75				29.40	33.10
CO	2.98	2.90	2.12				18.70	16.70
DE	1.95	1.30						
ID	2.82	2.35	2.29		3.15		20.80	17.80
KS	2.69	2.30					18.60	15.80
KY	2.06	1.30						
MD	2.05	1.30						
MI	1.90	1.50					18.90	22.50
MN	1.88	1.60	1.74		2.11		17.50	19.70
MT	2.83	2.25	2.09		3.12		19.40	16.40
NE	2.20	1.80					18.80	18.60
NV	2.85	2.50						
NJ	2.00	1.05						

NM					22.40	22.40
NY					20.60	25.30
NC	2.10	1.90				
ND	1.96	1.55	1.76	2.17	16.80	16.90
OK	2.15	1.70				
OR	2.39	1.50	2.36	2.92	19.50	17.90
PA	2.01	1.35				
SC	2.05	1.80				
SD	2.23	1.70	1.83	2.41		
TX	2.30	2.05			18.00	19.40
UT	2.29	1.70	2.29		20.00	18.00
VA	2.10	1.40				
WA	2.27	1.45	2.23	2.79	21.70	21.50
WI	1.70	1.15			22.10	26.90
WY	3.32	2.60	1.99	3.37	19.60	18.80
Year	United States					
1998	1.95		1/	1/	19.80	
1997	2.38		2.05	2.74	19.30	

1/ 1998 prices will be published in "Agricultural Prices", August 31, 1999.

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Corn	Cotton				Cottonseed	
		Pima		Upland			
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Bu	-------	Dollars per Lb	-------	Dollars per Ton			

AL :	2.82	2.20			.673	.629	111.00
111.00							
AZ :	3.20	2.75	.982	.979	.647	.652	134.00
149.00							
AR :	2.51	1.75			.657	.652	106.00
121.00							
CA :	3.05	2.55	1.020	1.000	.732	.744	174.00
177.00							
CO :	2.59	2.10					
DE :	2.95	2.40					
FL :	2.90	2.30			.654	.542	120.00
110.00							
GA :	2.90	2.40			.677	.674	108.00
104.00							
ID :	3.03	2.50					
IL :	2.53	2.05					
IN :	2.53	2.05					
IA :	2.33	1.90					
KS :	2.47	1.95			.579	.615	106.00
116.00							
KY :	2.62	2.10					
LA :	2.70	2.05			.649	.593	110.00
113.00							
MD :	2.98	2.35					
MI :	2.40	1.90					
MN :	2.15	1.75					
MS :	2.65	2.05			.649	.634	106.00
116.00							
MO :	2.45	1.90			.687	.706	111.00
131.00							
MT :	2.40	1.50					
NE :	2.32	1.95					
NJ :	2.80	2.20					
NM :	2.85	2.35	1.030	.926	.577	.696	134.00
149.00							
NY :	2.62	2.15					
NC :	2.83	2.25			.659	.687	114.00
114.00							
ND :	2.12	1.65					
OH :	2.48	2.00					
OK :	2.66	2.15			.579	.615	106.00
116.00							
OR :	303	2.40					
PA :	2.92	2.45					
SC :	2.79	2.30			.701	.681	108.00
108.00							
SD :	2.15	1.60					
TN :	2.65	2.05			.653	.636	115.00
131.00							
TX :	2.74	2.35	.983	.896	.601	.581	114.00
131.00							
UT :	3.05	2.40					
VA :	2.69	2.20			.675	.685	102.00
111.00							

WA	3.00	2.65
WV	2.80	2.10
WI	2.34	1.90
WY	2.52	2.00

Year	United States			
1998	1.95	.985	.642	129.00
1997	2.43	1.014	.652	121.00

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Alfalfa		Other		All	
	1997	1998	1997	1998	1997	1998
	Dollars per Ton					
AL			47.00	53.00	47.00	53.00
AK					190.00	
AZ	112.00	91.50	88.50	84.00	111.00	91.50
AR	128.00	127.00	54.00	54.00	59.00	61.00
CA	119.00	103.00	98.00	80.00	117.00	101.00
CO	101.00	93.50	106.00	102.00	101.00	94.00
CT	164.00	157.00	131.00	128.00	139.00	132.00
DE	163.00	142.00	131.00	127.00	145.00	137.00
FL			86.00	102.00	86.00	102.00
GA			59.00	68.00	59.00	68.00
ID	106.00	85.50	77.00	65.00	105.00	84.00
IL	107.00	91.00	82.00	68.00	102.00	86.50
IN	120.00	91.00	95.00	70.00	113.00	86.00

IA : 112.00 87.50 74.00 62.50 109.00
86.00
KS : 88.00 74.50 72.00 64.00 84.00
73.00
KY : 99.00 106.00 66.00 70.00 77.00
81.50
LA : 54.00 57.00 54.00
57.00
ME : 143.00 150.00 113.00 112.00 114.00
113.00
MD : 161.00 148.00 122.00 134.00 142.00
140.00
MA : 167.00 155.00 137.00 136.00 144.00
138.00
MI : 103.00 92.50 90.50 76.00 101.00
89.00
MN : 98.00 68.00 61.00 47.50 88.00
67.50
MS : 42.50 42.00 42.50
42.00
MO : 105.00 102.00 64.00 61.50 71.00
68.50
MT : 80.00 74.50 69.00 64.00 79.00
73.50
NE : 79.50 51.50 58.50 44.00 76.00
51.00
NV : 107.00 108.00 89.00 96.00 105.00
107.00
NH : 167.00 154.00 131.00 141.00 137.00
143.00
NJ : 144.00 143.00 111.00 113.00 120.00
122.00
NM : 127.00 121.00 97.00 98.00 124.00
119.00
NY : 110.00 101.00 80.50 79.50 94.00
89.50
NC : 125.00 115.00 82.00 80.00 84.00
81.50
ND : 65.00 58.00 43.50 38.50 60.00
52.50
OH : 163.00 113.00 87.00 67.00 135.00
96.50
OK : 94.00 99.50 54.50 60.00 78.00
84.00
OR : 123.00 111.00 91.50 89.50 117.00
108.00
PA : 158.00 131.00 123.00 103.00 138.00
115.00
RI : 168.00 167.00 133.00 146.00 146.00
154.00
SC : 85.00 85.00 85.00
85.00
SD : 81.50 58.00 55.50 38.00 77.00
53.50

TN	108.00	116.00	54.00	51.00	56.00	53.00
TX	136.00	150.00	61.00	75.50	72.00	91.00
UT	85.00	79.00	64.00	55.00	84.00	78.00
VT	155.00	141.00	125.00	117.00	131.00	120.00
VA	110.00	124.00	78.00	77.50	83.00	82.50
WA	111.00	96.50	136.00	126.00	115.00	101.00
WV	109.00	75.00	49.00	48.50	55.00	51.50
WI	97.50	82.50	66.50	61.50	91.50	78.00
WY	86.00	78.00	77.00	72.00	85.00	77.50

Year	United States		
1998	91.00	73.50	87.00
1997	107.00	75.70	100.00

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Flaxseed		Hops		Oats		Peanuts	
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Bu		Dollars per Lb		Dollars per Bu		Dollars per Lb	
AL					1.70	2.05	.293	.277
AK					2.50	2.60		
AR					2.15	1.45		
CA					1.98	1.40		
CO					2.05	1.70		
FL							.280	.247
GA					1.87	1.50	.303	.266

ID	:		1.41	1.52	1.64	1.15	
IL	:				1.71	1.25	
IN	:				1.94	1.70	
IA	:				1.63	1.15	
KS	:				1.52	1.60	
ME	:				1.20	.95	
MD	:				1.75	1.65	
MI	:				1.86	1.30	
MN	:	5.85	4.70		1.46	.95	
MO	:				1.85	1.60	
MT	:				1.33	1.25	
NE	:				1.79	1.15	
NM	:						.300
.235							
NY	:				1.70	1.40	
NC	:				1.80	1.50	.277
.242							
ND	:	5.81	5.10		1.32	.85	
OH	:				1.76	1.35	
OK	:				2.10	1.80	.293
.309							
OR	:		1.68	1.78	1.77	1.30	
PA	:				1.84	1.30	
SC	:				1.55	1.30	.287
.286							
SD	:	5.68	4.80		1.56	.95	
TX	:				2.36	1.40	.243
.232							
UT	:				1.97	1.35	
VA	:						.301
.249							
WA	:		1.60	1.60	1.75	1.30	
WV	:				2.07	1.30	
WI	:				1.46	.95	
WY	:				1.86	1.80	

Year	:	United States			
1998	:	5.10	1.62	1.10	.257
1997	:	5.81	1.60	1.60	.283

Special Oilseeds: United States, 1992-97 Final, 1998 Preliminary 1/

Year	:	Canola	:	Rapeseed	:	Safflower	:	Mustard Seed
	:	Dollars per Cwt						

1998	10.30	10.30	14.20	13.60
1997	11.30	13.20	15.40	15.90
1996	12.90	13.30	18.10	16.90
1995	11.10	12.00	14.60	12.20
1994	11.10	10.30	14.60	10.80
1993	10.90	10.20	15.20	10.80
1992	9.90	10.00	14.10	10.70

1/ Average to December.

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Potatoes		Rice		Rye		Sorghum	
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Cwt				Dollars per Bu		Dollars per Cwt	
AL	8.60	12.90					3.95	3.30
AK	20.00	20.90						
AZ	8.75	9.90						
AR			9.87	8.55			4.59	3.35
CA	10.90	11.30	7.95	8.15				
CO	4.60	3.85			3.30	1.80	3.91	3.10
DE	8.25	8.45						
FL	12.10	14.70						
GA					5.00	3.40	4.70	3.60
ID	4.50	3.90						
IL	5.50	5.15			2.90	2.40	4.25	3.45
IN	6.15	5.75			2.90	2.30		
IA	5.45	4.35						
KS					3.60	2.20	3.80	3.00
KY							4.54	3.50
LA			10.20	8.90			4.40	3.75
ME	6.40	6.25						
MD	6.85	7.00			2.45	2.30		
MA	7.70	6.75						

MI	6.45	6.25			2.90	2.50	
MN	5.55	5.20			3.10	1.75	
MS			10.40	8.75			4.45
3.55							
MO	5.30	5.15	10.00	8.65			3.93
3.00							
MT	7.05	7.95					
NE	6.15	4.85			3.60	1.80	3.84
3.15							
NV	4.50	4.20					
NJ	6.50	7.00			3.60	3.00	
NM	6.05	6.10					4.45
3.85							
NY	8.75	9.45			2.10	2.00	
NC	6.60	6.15			2.60	2.40	4.60
3.60							
ND	5.65	5.65			3.12	2.20	
OH	8.25	6.95			3.05	2.50	
OK					4.50	3.50	3.94
3.35							
OR	5.20	4.90					
PA	8.20	7.00			3.75	3.50	
RI	7.60	6.80					
SC					3.00	2.50	4.10
3.30							
SD	4.90	4.95			3.60	1.90	3.55
3.00							
TN							4.59
3.40							
TX	10.30	9.35	10.90	9.15	3.90	3.90	4.18
3.90							
UT	4.35	4.75					
VA	10.80	6.75			2.45	2.00	
WA	4.90	4.50					
WI	5.70	4.95			3.60	1.75	
WY	5.05	5.05					
Year	United States						
1998	5.24		8.50		2.49		3.10
1997	5.62		9.70		3.75		3.95

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

	Soybeans	Sugarbeets	Sugarcane

State	1997	1998	1997	1998 1/	1997	1998 1/
	Dollars per Bu		Dollars per Ton			
AL	6.65	5.50				
AR	6.88	5.70				
CA			40.60			
CO			34.10			
DE	7.00	5.70				
FL	7.00	5.40			28.70	
GA	6.68	5.35				
HI					29.20	
ID			40.60			
IL	6.56	5.45				
IN	6.59	5.35				
IA	6.33	5.30				
KS	6.42	5.35				
KY	6.76	5.60				
LA	6.98	5.80			27.10	
MD	6.90	5.65				
MI	6.47	5.25	38.50			
MN	6.20	5.10	38.70			
MS	6.90	6.05				
MO	6.39	5.30				
MT			40.50			
NE	6.28	5.15	35.60			
NJ	6.75	5.40				
NM			31.20			
NY		5.30				
NC	6.68	5.40				
ND	6.10	5.00	37.90			
OH	6.49	5.30	38.40			
OK	6.40	5.00				
OR			39.90			
PA	6.80	5.30				
SC	6.55	5.35				
SD	6.11	4.90				
TN	6.89	5.60				
TX	633	4.80	34.00		25.60	
VA	6.20	5.70				
WA			38.90			
WI	6.38	5.30				
WY			38.50			

Year	United States		
1998	5.35	1/	1/

1997	6.47		38.80				28.10	

1/ U.S. prices will be published in "Agricultural Prices", July 31, 1999.
State prices will be published in "Crop Values", February 1999.

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Sunflower						Sweetpotatoes	
	Non-Oil		Oil		All			
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Cwt							
AL							20.50	15.10
CA							28.00	25.80
CO	14.30	14.20	10.90	10.70	12.30	11.80		
GA							15.40	16.50
KS	14.80	14.10	10.80	9.30	12.30	10.60		
LA							14.40	14.40
MN	14.00	12.90	11.40	9.95	12.30	11.30		
MS							18.50	17.50
NE	15.00	13.60	10.30	9.50	12.70	10.80		
NJ							20.40	21.50
NC							10.80	11.00
ND	14.40	13.50	11.10	9.40	11.80	10.50		
SC							15.40	12.50
SD	11.80	9.20	10.90	9.25	10.90	9.25		
TX	14.00	15.00	13.00	13.00	13.70	14.00	16.20	16.40
VA							11.60	12.30
Year	United States							

1998	13.20	9.35	10.20	15.30
1997	14.30	11.00	11.60	15.80

Prices Received: Wheat by Class, Marketing Year Average, United States, 1997 Revised and 1998 Preliminary

Year	Class		
	All Hard Red	Soft Red Winter	White
	Dollars per Bushel		
1998	1/	1/	1/
1997	3.33	3.21	3.35

1/ 1998 prices will be published in "Agricultural Prices", August 31, 1999.

Tobacco: Marketing Year Average Price, by Class, Type, State, and United States, 1997-98 1/

Class and State	Type	1997	1998
		Dollars per Pound	
Flue-cured:			
Old Belts			
NC	11	1.710	1.780
VA	11	1.727	1.792
US	11	1.716	1.784
Eastern NC Belt			
NC	12	1.720	1.773
NC Border & SC Belt			
NC	13	1.720	1.716

SC	:	13	:	1.735
1.711				
US	:	13	:	1.728
1.713				
GA-FL Belt	:		:	
FL	:	14	:	1.721
1.697				
GA	:	14	:	1.712
1.707				
US	:	14	:	1.714
1.705				
Total Flue-cured	:	11-14	:	1.720
1.756				
	:		:	
Fire-cured:	:		:	
VA Belt	:		:	
VA	:	21	:	2.125
1.936				
Eastern District	:		:	
KY	:	22	:	2.268
2.259				
TN	:	22	:	2.260
2.251				
US	:	22	:	2.263
2.254				
Western District	:		:	
KY	:	23	:	2.242
2.159				
TN	:	23	:	2.226
2.159				
US	:	23	:	2.240
2.159				
KY-TN Fire-cured	:	22-23	:	2.256
2.225				
Total Fire-cured	:	21-23	:	2.250
2.208				
	:		:	
Air-cured:	:		:	
Light Air-cured:	:		:	
Burley	:		:	
IN	:	31	:	1.870
1.897				
KY	:	31	:	1.886
1.903				
MO	:	31	:	1.895
1.905				
NC	:	31	:	1.860
1.899				
OH	:	31	:	1.869
1.904				
TN	:	31	:	1.886
1.907				
VA	:	31	:	1.903
1.892				

WV	31	1.878	1.915
US	31	1.885	1.903
Southern MD Belt			
MD	32	1.720	1.630
PA	32	1.300	.800
US	32	1.576	1.291
Total Light Air-cured	31-32	1.877	1.887
Dark Air-cured:			
One-Sucker Belt			
KY	35	2.011	1.952
TN	35	2.003	1.913
US	35	2.010	1.946
Green River Belt			
KY	36	2.034	1.974
KY-TN Dark Air-cured	35-36	2.017	1.955

See footnotes at end of table. -- continued

Tobacco: Marketing Year Average Price, by Class, Type, State, and United States, 1997-98 1/ (continued)

Class and State	Type	1997	1998
		Dollars per Pound	
VA Sun-cured Belt			
VA	37	1.908	1.709
Total Dark Air-cured	35-37	2.016	1.951
All Cures Other Than Cigar	11-37	1.793	1.823

	:	:	
Cigar Filler:	:	:	
PA Seedleaf	:	:	
PA	: 41	: 1.600	1.300
	:	:	
Cigar Binder:	:	:	
CT Valley Broadleaf	:	:	
CT	: 51	: 6.000	5.400
MA	: 51	: 9.500	5.670
US	: 51	: 7.273	5.499
WI Binder, Southern	:	:	
WI	: 54	: 1.500	1.500
WI Binder, Northern	:	:	
WI	: 55	: 1.520	1.490
Total WI Binder	: 54-55	: 1.505	1.497
Total Binder	: 51-55	: 3.754	3.524
	:	:	
Cigar Wrapper:	:	:	
CT Valley Shade-grown	:	:	
CT 2/	: 61	:	
MA 2/	: 61	:	
US 2/	: 61	:	
	:	:	
Total Cigar Types 2/	: 41-55	: 2.599	2.260
	:	:	
US All Tobacco 2/	: 11-55	: 1.802	1.828

1/ 1998 revised.
2/ CT and MA Type 61 price not published to avoid disclosure; not included in
Total Cigar Types or US All Tobacco.

Tobacco: Marketing Year Average Price, by State, 1997-98 1/

State	: 1997	: 1998	: State	: 1997	: 1998
	: Dollars per Pound	:	:	Dollars per Pound	

CT 2/	6.000	5.400	NC	1.720	1.771
FL	1.721	1.697	OH	1.869	1.904
GA	1.712	1.707	PA	1.490	1.101
IN	1.870	1.897	SC	1.735	1.711
KY	1.903	1.917	TN	1.952	1.963
MD	1.720	1.630	VA	1.765	1.816
MA 2/	9.500	5.670	WV	1.878	1.915
MO	1.895	1.905	WI	1.505	1.497

1/ 1998 revised.
2/ CT and MA Type 61 not published to avoid disclosure.

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Wheat							
	Winter		Durum		Other Spring		All	
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Bu							
AL	3.20	2.60					3.20	2.60
AZ	4.05	2.60	4.70	4.70			4.70	3.85
AR	3.49	2.80					3.49	2.80
CA	3.71	3.00	4.28	5.20			3.82	3.05
CO	3.17	2.60			3.16	2.40	3.17	2.60
DE	3.07	2.40					3.07	2.40
FL	3.40	2.50					3.40	2.50

GA	:	3.19	2.60					3.19
2.60								
ID	:	3.12	2.10			3.12	2.25	3.12
2.25								
IL	:	3.14	2.45					3.14
2.45								
IN	:	3.18	2.40					3.18
2.40								
IA	:	3.16	2.75					3.16
2.75								
KS	:	3.16	2.55					3.16
2.55								
KY	:	3.24	2.20					3.24
2.20								
LA	:	3.50	2.75					3.50
2.75								
MD	:	3.15	2.45					3.15
2.45								
MI	:	3.26	2.35					3.26
2.35								
MN	:	3.22	2.40	5.30	3.10	3.53	3.20	3.52
3.20								
MS	:	3.17	2.25					3.17
2.25								
MO	:	3.09	2.40					3.09
2.40								
MT	:	3.40	2.85	5.18	4.00	3.58	3.40	3.62
3.35								
NE	:	3.20	2.60					3.20
2.60								
NV	:	3.25	2.05			3.25	2.15	3.25
2.10								
NJ	:	3.20	2.45					3.20
2.45								
NM	:	3.25	2.65					3.25
2.65								
NY	:	3.35	2.15					3.35
2.15								
NC	:	3.20	2.50					3.20
2.50								
ND	:	3.17	2.75	4.91	3.20	3.48	3.15	3.82
3.20								
OH	:	3.16	2.30					3.16
2.30								
OK	:	3.21	2.60					3.21
2.60								
OR	:	3.53	2.60			3.61	2.65	3.55
2.60								
PA	:	3.37	2.50					3.37
2.50								
SC	:	3.20	2.50					3.20
2.50								
SD	:	3.10	2.50	4.28	3.10	3.58	3.05	3.41
2.85								

TN	3.30	2.65				3.30		2.65
TX	3.25	2.70				3.25		2.70
UT	3.29	2.75	3.51	2.45	3.32			2.70
VA	3.05	2.40			3.05			2.40
WA	3.36	2.50	3.61	2.90	3.39			2.60
WV	3.25	2.30			3.25			2.30
WI	3.00	2.10	3.00	2.10	3.00			2.10
WY	3.10	260	3.12	2.80	3.10			2.70

Year	United States			
1998	2.50	3.40	3.05	2.70
1997	3.23	4.92	3.53	3.38

Crops: Marketing Year Average Prices Received, by States and United States, 1997 Revised and 1998 Preliminary, (continued)

State	Apples for Fresh Use		Peaches for Fresh Use		Spearmint		Peppermint	
	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Lb							
AL			.302	.456				
AZ	.553	.400						
CA	.332	.293	.138	.198				
CO	.191	.134						
CT	.360	.395	.700	.700				
ID	.247	.128			12.40	11.20	11.20	10.00
IL	.219	.228	.406	.433				
IN	.278	.316	.545	.318	12.00	12.00	13.60	12.70

KY	.270	.284	.299	.375				
LA			.453	.710				
ME	.240	.270						
MD	.254	.246						
MA	.320	.395	.700	.800				
MI	.150	.130	1/	.315	11.00	11.20		
MO	.230	.223	.350	.396				
NH	.270	.350						
NJ	.203	.200						
NM	.339	.210						
NY	.176	.158						
NC	.227	.170						
OH	.265	.269	.400	.416				
OK			.224	.412				
OR	.316	.210			13.00	12.00	15.30	13.70
PA	.227	.223						
SC	.205	.293	.216	.280				
TN			.380	.450				
TX			.350	.520				
UT	.183	.170	.270	.270				
VT	.220	.288						
VA	.204	.189	.280	.300				
WA	.213	.151			11.60	10.50	11.00	10.00
WV	.187	.159						
WI	.329	.316			14.00	13.00	14.00	10.00
Year	United States							
1998	.171	.294			10.90			11.60
1997	.221	.244			11.90			12.90

1/ Combined with Other States in 1997.

Noncitrus Fruits and Nuts: Marketing Year Average Prices, by State, 1996-1998, and United States, 1993-98

State	All Pecans			All Pears		
	1996	1997	1998	1996	1997	1998
	----- Dollars per Pound ------			----- Dollars per Ton ----		

	:					
AL	:	.530	.648	.870		
AZ	:	.620	1.250	1.590		
AR	:	.900	.671	1.030		
CA	:	.830	1.320	1.660	289.00	273.00
264.00						
CO	:				436.00	295.00
449.00						
CT	:				725.00	700.00
775.00						
FL	:	.576	.733	.804		
GA	:	.624	.832	1.220		
KS	:	.980	.670	.880		
LA	:	.463	.550	.675		
MI	:				260.00	250.00
271.00						
MS	:	.675	.753	.800		
NM	:	.740	.940	1.490		
NY	:				383.00	384.00
375.00						
NC	:	.580	.830	.920		
OK	:	.638	.568	.734		
OR	:				457.00	278.00
338.00						
PA	:				505.00	552.00
351.00						
SC	:	.652	.748	1.180		
TX	:	.725	.649	1.150		
UT	:				483.00	586.00
307.00						
WA	:				419.00	272.00
277.00						

Year	:	United States					
1998	:	1.210			291.00		
1997	:	.774			276.00		
1996	:	.641			376.00		
1995	:	1.010			272.00		
1994	:	1.040			223.00		
1993	:	.586			245.00		

	:	Avocados			Hazelnuts		
State	:						
	:	1996	1997	1998	1996	1997	1998
	:	Dollars per Ton					
	:						

CA	1,560.00	1,710.00	1,630.00		
FL	528.00	584.00	716.00		
HI	1,070.00	1,060.00	1,040.00		
OR				859.00	899.00 964.00
WA				940.00	940.00 960.00

Year	United States		
1998	1,480.00		964.00
1997	1,560.00		899.00
1996	1,430.00		860.00
1995	1,300.00		913.00
1994	1,380.00		835.00
1993	1,780.00		633.00

Noncitrus Fruits and Nuts: Marketing Year Average Prices, California and Hawaii, 1993-98 1/

Year	Almonds	Bananas	Dates	Grape Types		
				Raisin	Wine	Table
	Dollars per Pound			Dollars per Ton		
1998	1.40	.350	1,130.00	274.00	581.00	497.00
1997	1.56	.380	1,100.00	262.00	598.00	448.00
1996	2.08	.400	1,090.00	281.00	536.00	650.00
1995	2.48	.400	780.00	234.00	424.00	523.00
1994	1.34	.370	750.00	229.00	378.00	515.00
1993	1.94	.380	790.00	255.00	361.00	574.00

Year	Figs	Kiwi-fruit	Nectarines	Olives	Macadamia Nuts	Papayas	Coffee

	--- Dollars per Ton ---				--- Dollars per Pound ---	
1998	248.00	744.00	472.00	459.00	.650	.316
1997	265.00	518.00	375.00	642.00	.750	.489
1996	283.00	470.00	474.00	617.00	.780	.408
1995	314.00	459.00	534.00	646.00	.740	.364
1994	419.00	491.00	282.00	464.00	.690	.223
1993	401.00	370.00	500.00	467.00	.680	.215

Year	Pineapples	Plums	Prunes (Dried)	Walnuts	Pistachios	Taro
	--- Dollars per Ton ---				Dollars per Pound	
1998	279.00	529.00	836.00	1,010.00	1.030	.530
1997	283.00	312.00	798.00	1,430.00	1.130	.510
1996	276.00	420.00	839.00	1,580.00	1.160	.490
1995	253.00	950.00	1,040.00	1,400.00	1.090	.480
1994	216.00	321.00	1,090.00	1,030.00	.921	.460
1993	216.00	508.00	1,120.00	1,390.00	1.070	.460

1/ Prices for Bananas, Coffee, Papayas, Pineapples, Macadamia Nuts and Taro are HI prices. Prices for Nectarines, Olives, Plums, Walnuts, Pistachios, Almonds, Pomegranates, Prunes(Dried), Dates, Grapes, Figs and Kiwifruit are CA prices.

Noncitrus Fruits and Nuts: Marketing Year Average Prices, by State, 1996-1998, and United States, 1993-98

State	All Sweet Cherries			All Tart Cherries		
	1996	1997	1998	1996	1997	1998
	------ Dollars per Ton -------			------ Dollars per Pound ------		
CA	1,850.00	1,290.00	1,560.00			
CO				.473	.560	.448
ID	1,250.00	1,290.00	1,070.00			
MI	709.00	740.00	562.00	.160	.156	.140
MT	1,420.00	954.00	1,080.00			
NY	1,420.00	1,720.00	2,070.00	.144	.173	.180
OR	1,090.00	1,130.00	862.00	.206	.210	.127
PA	2,240.00	2,380.00	2,320.00	.227	.258	.190
UT	1,130.00	920.00	687.00	.127	.160	.160
WA	1,780.00	1,430.00	1,330.00	.163	.100	.120
WI				.178	.174	.102

Year	United States	
1998	1,090.00	.143
1997	1,250.00	.159
1996	1,470.00	.161
1995	1,260.00	.059
1994	1,040.00	.163
1993	1,190.00	.121

State	All Grapes			Cranberries		
	1996	1997	1998	1996	1997	1998 1/
	----- Dollars per Ton -----			------ Dollars per Barrel ----		
AZ	803.00	588.00	751.00			
AR	629.00	586.00	497.00			

CA	438.00	434.00	447.00		
GA	1,050.00	933.00	1,110.00		
MA				70.90	66.20
MI	228.00	252.00	249.00		
MO	480.00	479.00	531.00		
NJ				61.80	56.60
NY	257.00	284.00	305.00		
NC	757.00	968.00	1,030.00		
OH	244.00	286.00	314.00		
OR	1,020.00	1,120.00	1,180.00	60.50	55.70
PA	237.00	257.00	267.00		
SC	1,090.00	1,220.00	1,520.00		
WA	401.00	390.00	482.00	61.00	55.70
WI				63.80	65.00
Year	United States				
1998	445.00			1/	
1997	428.00			63.70	
1996	429.00			65.90	
1995	346.00			53.40	
1994	321.00			49.30	
1993	333.00			50.20	

1/ Prices for 1998 will be published in "Cranberries", August 17, 1999.

Noncitrus Fruits: Marketing Year Average Prices, by State 1997-98 and United States, 1993-98

States	Apricots			Prunes and Plums		
	1996	1997	1998	1996	1997	1998
	Dollars per Ton					
CA	403.00	308.00	311.00			
ID				596.00	517.00	553.00
MI				335.00	348.00	300.00
OR				354.00	238.00	274.00
UT	859.00	492.00	728.00			
WA	1,420.00	751.00	637.00	448.00	184.00	219.00

Year	United States	4 State Total
1998	327.00	311.00
1997	332.00	273.00
1996	444.00	442.00
1995	456.00	313.00
1994	349.00	168.00
1993	398.00	183.00

State	All Blueberries			All Boysenberries			All Red Raspberries		
	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Dollars per Pound								
AL	.885	.906	1.260						
AR	1.480	.998	1.000						
CA 1/				.937	.667	.792	1.710	1.390	1.920
FL	2.160	2.520	3.120						
GA	.803	.718	.770						
IN	.879	.854	.880						
MI	.865	.695	.618						
NJ	.971	.999	.788						
NY	1.020	1.070	1.030						
NC	1.010	1.170	.913						
OR	.750	.733	.502	1.040	.549	.450	.850	.551	.453
WA	.689	.892	.625				.744	.471	.376
US	.907	.831	.725	1.010	.579	.525	.772	.489	.391

1/ CA prices in the All Red Raspberries columns are for all CA raspberries, regardless of color, and are not in the U.S. average price for All Red Raspberries.

Noncitrus Fruits: Marketing Year Average Prices, Oregon, 1996-98

State	All Blackberries			All Loganberries			All Black Raspberries		
	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Dollars per Pound								
OR	.886	.403	.448	.988	1.190	.864	1.670	1.900	2.100

Oranges: Marketing Year Average Prices Received,
Crop Years 1995-96 and 1996-97

State, Variety, and Utilization	1995-96 F.O.B. Packed	1995-96 Equiv. P.H.D.	1995-96 Equiv. On-Tree	1996-97 F.O.B. Packed	1996-97 Equiv. P.H.D.	1996-97 Equiv. On-Tree
	Dollars per box					
AZ						
Navel & Misc.		6.72	4.74		8.88	6.90
Fresh	14.70	8.68	6.70	16.50	10.48	8.50
Processing		-0.48	-2.46		-0.20	-2.18
Valencias		4.12	2.03		5.28	3.20
Fresh	11.50	5.60	3.52	11.20	5.30	3.22
Processing		-0.48	-2.56		1.20	-0.88
All		5.22	3.18		6.72	4.68
Fresh	12.90	6.94	4.90	13.10	7.18	5.14
Processing		-0.48	-2.52		-0.13	-2.13
CA						
Navel & Misc.		7.35	5.37		9.35	7.37
Fresh	15.80	9.78	7.80	16.80	10.78	8.80
Processing		-0.48	-2.46		0.36	-1.62
Valencias		10.51	8.43		8.77	6.69
Fresh	19.60	13.70	11.62	17.20	11.30	9.22
Processing		-0.48	-2.56		2.61	0.53
All		8.44	6.43		9.13	7.11
Fresh	17.10	11.15	9.13	16.90	10.95	8.94
Processing		-0.48	-2.49		1.62	-0.42
CA-AZ 1/						

Navel & Misc.	15.80	9.76	7.78	16.80	10.78	8.80
Valencias	19.20	13.34	11.26	17.00	11.10	9.02
FL						
Early/Mids.		5.67	3.62		5.08	3.18
Fresh	14.00	7.00	4.95	13.40	6.40	4.50
Processing		5.59	3.54		5.01	3.11
Valencias		7.67	5.57		6.01	4.07
Fresh	15.50	8.50	6.45	13.60	6.60	4.70
Processing		7.63	5.53		5.99	4.04
All		6.47	4.40		5.46	3.54
Fresh	14.50	7.51	5.46	13.50	6.47	4.57
Processing		6.42	4.35		5.41	3.49
TX						
Early/Mids.		7.62	6.48		5.16	3.88
Fresh	16.20	8.60	7.45	15.00	6.20	4.90
Processing		2.96	1.86		3.13	1.88
Valencias		8.95	7.80		7.12	5.83
Fresh	17.00	9.40	8.25	16.60	7.80	6.50
Processing		3.10	2.00		4.37	3.12
All		7.78	6.64		5.33	4.04
Fresh	16.30	8.70	7.55	15.20	6.36	5.06
Processing		2.97	1.87		3.19	1.94
US						
Early/Mids. & Navels		6.03	4.00		5.93	4.02
Fresh	15.40	9.16	7.19	16.10	9.83	7.88
Processing		5.21	3.16		4.84	2.94
Valencias		8.11	6.02		6.50	4.53
Fresh	18.50	12.36	10.29	16.30	10.22	8.17
Processing		7.24	5.14		5.78	3.82
All		6.85	4.79		6.16	4.22
Fresh	16.50	10.27	8.27	16.20	9.96	7.98
Processing		6.03	3.96		5.23	3.31

1/ Fresh only.

Oranges: Marketing Year Average Prices Received,
Crop Year 1997-98

State, Variety, and Utilization	1997-98		
	F.O.B. Packed	Equiv. P.H.D.	Equiv. On-Tree
	Dollars per box		

AZ	:			
Navel & Misc.	:		5.46	3.48
Fresh	:	14.20	8.18	6.20
Processing	:		-0.10	-2.08
Valencias	:		5.28	3.20
Fresh	:	11.20	5.30	3.22
Processing	:		1.89	-0.19
All	:		5.35	3.30
Fresh	:	12.00	6.07	4.01
Processing	:		-0.05	-2.03
	:			
CA	:			
Navel & Misc.	:		8.84	6.86
Fresh	:	16.60	10.58	8.60
Processing	:		0.36	-1.62
Valencias	:		9.33	7.25
Fresh	:	17.00	11.10	9.02
Processing	:		2.23	0.15
All	:		9.04	7.02
Fresh	:	16.80	10.79	8.77
Processing	:		1.19	-0.83
	:			
CA-AZ 1/	:			
Navel & Misc.	:	16.60	10.56	8.58
Valencias	:	16.80	10.95	8.87
	:			
FL	:			
Early/Mids.	:		4.24	2.48
Fresh	:	12.70	5.60	3.70
Processing	:		4.16	2.41
Valencias	:		6.99	5.14
Fresh	:	13.20	6.10	4.20
Processing	:		7.02	5.17
All	:		5.41	3.61
Fresh	:	12.90	5.76	3.86
Processing	:		5.39	3.60
	:			
TX	:			
Early/Mids.	:		3.67	2.38
Fresh	:	12.90	4.10	2.80
Processing	:		2.49	1.24
Valencias	:		5.51	4.22
Fresh	:	14.50	5.70	4.40
Processing	:		4.69	3.44
All	:		3.88	2.59
Fresh	:	13.10	4.30	3.00
Processing	:		2.67	1.42
	:			
US	:			
Early/Mids. & Navels	:		5.18	3.38
Fresh	:	15.70	9.44	7.50
Processing	:		3.98	2.22
Valencias	:		7.43	5.53

Fresh	16.30	10.20	8.15
Processing		6.79	4.93
All		6.13	4.29
Fresh	16.00	9.73	7.75
Processing		5.19	3.39

1/ Fresh only.

Grapefruit: Marketing Year Average Prices Received,
Crop Years 1995-96 and 1996-97

State, Variety, and Utilization	1995-96 F.O.B. Packed	1995-96 Equiv. P.H.D.	1995-96 Equiv. On-Tree	1996-97 F.O.B. Packed	1996-97 Equiv. P.H.D.	1996-97 Equiv. On-Tree
	Dollars per box					
AZ		3.70	1.76		2.99	1.05
Fresh	11.50	6.06	4.12	11.50	6.06	4.12
Processing		-0.28	-2.22		-0.42	-2.36
CA		6.38	4.44		5.97	4.03
Fresh	14.20	8.76	6.82	13.90	8.46	6.52
Processing		-0.43	-2.37		-0.41	-2.35
CA-AZ						
Fresh	13.90	8.46	6.52	13.70	8.28	6.34
FL						
Seedless-Clrd		3.83	1.77		4.07	1.91
Fresh	12.30	4.81	2.96	12.70	5.12	3.26
Processing		2.33	-0.06		2.74	0.20
Seedless-Whte		4.31	2.14		3.38	1.18
Fresh	16.20	7.80	5.88	15.60	7.16	5.23
Processing		3.13	0.88		2.18	-0.10
Seedless-All		4.05	1.94		3.78	1.60
Fresh	13.30	5.58	3.71	13.40	5.62	3.74
Processing		2.82	0.51		2.42	0.03
Other		3.43	1.73		1.93	0.13
Fresh 1/						
Processing		3.43	1.73		1.93	0.13
All		4.03	1.93		3.75	1.58
Fresh	13.30	5.58	3.71	13.40	5.62	3.74
Processing		2.84	0.56		2.41	0.03

TX		4.67	3.69		4.17	3.03
Fresh	13.70	6.22	5.22	14.00	5.30	4.15
Processing		1.61	0.66		1.50	0.40
US		4.31	2.30		3.98	1.91
Fresh	13.40	6.13	4.33	13.50	6.00	4.20
Processing		2.59	0.38		2.21	-0.09

1/ Fresh sales insignificant and included in processed.

Grapefruit: Marketing Year Average Prices Received,
Crop Year 1997-98

State, Variety, and Utilization	F.O.B. Packed	1997-98 Equiv. P.H.D.	1997-98 Equiv. On-Tree
		Dollars per box	
AZ		4.70	2.76
Fresh	13.20	7.76	5.82
Processing		-0.26	-2.20
CA		6.64	4.70
Fresh	15.70	10.26	8.32
Processing		-0.26	-2.20
CA-AZ			
Fresh	15.50	10.07	8.13
FL			
Seedless-Clrd		3.10	0.86
Fresh	12.40	4.71	2.85
Processing		1.25	-1.42
Seedless-Whte		2.84	0.52
Fresh	15.90	7.31	5.38
Processing		1.23	-1.23
Seedless-All		3.00	0.73
Fresh	13.20	5.30	3.43
Processing		1.24	-1.33
Other		1.50	-0.30
Fresh 1/			
Processing		1.50	-0.30
All		2.98	0.72
Fresh	13.20	5.30	3.43
Processing		1.25	-1.30

TX	:		4.70		3.57
Fresh	:	14.60	5.90		4.75
Processing	:		1.50		0.40
	:				
US	:		3.55		1.41
Fresh	:	13.70	6.18		4.38
Processing	:		1.13		-1.31

1/ Fresh sales insignificant and included in processed.

Lemons, Limes, Tangelos, Tangerines, and Temples: Marketing Year Average Prices Received, Crop Years 1995-96 and 1996-97

State, Variety, and Utilization	1995-96 F.O.B. Packed	1995-96 Equiv. P.H.D.	1995-96 Equiv. On-Tree	1996-97 F.O.B. Packed	1996-97 Equiv. P.H.D.	1996-97 Equiv. On-Tree
	Dollars per box					
Lemons						
AZ		8.38	4.74		10.88	7.24
Fresh	22.30	13.86	10.22	25.10	16.66	13.02
Processing		1.88	-1.76		3.02	-0.62
CA		10.41	6.77		12.13	8.49
Fresh	26.90	18.46	14.82	29.30	20.86	17.22
Processing		1.88	-1.76		3.02	-0.62
US		10.01	6.37		12.00	8.36
Fresh	26.00	17.52	13.88	28.80	20.38	16.74
Processing		1.88	-1.76		3.02	-0.62
Limes						
FL		13.05	8.05		11.93	6.93
Fresh	26.10	15.60	10.60	25.00	14.50	9.50
Processing		2.83	-2.17		1.81	-3.19
Tangelos						
FL		6.16	3.63		4.75	2.19
Fresh	15.20	7.80	5.35	13.90	6.50	4.05
Processing		5.00	2.40		4.13	1.53
Tangerines						
AZ		10.80	8.72		15.21	13.13

Fresh	:	20.10	14.20	12.12	22.80	16.90	14.82
Processing	:		-0.32	-2.40		-0.28	-2.36
	:						
CA	:		10.84	8.76		15.11	13.03
Fresh	:	21.70	15.80	13.72	24.50	18.60	16.52
Processing	:		-0.32	-2.40		-0.28	-2.36
	:						
FL	:		15.91	12.59		11.35	7.99
Fresh	:	28.90	20.35	17.15	24.50	15.95	12.75
Processing	:		5.61	2.01		4.56	0.96
	:						
US	:		13.94	11.10		12.42	9.42
Fresh	:	25.90	18.38	15.62	24.40	16.78	13.97
Processing	:		3.38	0.35		3.87	0.49
	:						
	:						
Temples	:						
FL	:		6.52	4.44		5.23	3.22
Fresh	:	14.60	7.60	5.55	15.70	8.70	7.00
Processing	:		6.01	3.91		4.18	2.08

Lemons, Limes, Tangelos, Tangerines, and Temples: Marketing Year Average Prices Received, Crop Year 1997-98

State, Variety, and Utilization	:	1997-98		
	:	F.O.B. Packed	Equiv. P.H.D.	Equiv. On-Tree
	:	Dollars per box		
Lemons	:			
AZ	:		9.16	5.52
Fresh	:	23.30	14.86	11.22
Processing	:		2.20	-1.44
CA	:		9.97	6.33
Fresh	:	27.20	18.76	15.12
Processing	:		2.18	-1.46
US	:		9.88	6.24
Fresh	:	26.70	18.29	14.65
Processing	:		2.18	-1.46
	:			
	:			
Limes	:			
FL	:		10.02	5.02
Fresh	:	23.00	12.50	7.50
Processing	:		2.59	-2.41
	:			

	:			
Tangelos	:			
FL	:		4.03	1.49
Fresh	:	13.80	6.30	3.90
Processing	:		2.96	0.36
	:			
	:			
Tangerines	:			
AZ	:		12.53	10.45
Fresh	:	21.50	15.60	13.52
Processing	:		0.00	-2.08
	:			
CA	:		11.58	9.50
Fresh	:	22.70	16.80	14.72
Processing	:		0.02	-2.06
	:			
FL	:		11.75	8.41
Fresh	:	24.30	15.70	12.50
Processing	:		4.10	0.50
	:			
US	:		11.75	8.81
Fresh	:	23.70	15.97	13.14
Processing	:		2.96	-0.21
	:			
	:			
Temples	:			
FL	:		4.89	2.84
Fresh	:	13.60	6.50	4.60
Processing	:		4.35	2.25

K-Early Citrus: Marketing Year Average Prices Received,
Crop Years 1995-96 and 1996-97

State and Utilization	1995-96 F.O.B. Packed	1995-96 Equiv. P.H.D.	1995-96 Equiv. On-Tree	1996-97 F.O.B. Packed	1996-97 Equiv. P.H.D.	1996-97 Equiv. On-Tree
	Dollars per box					
K-Early Citrus						
FL		4.82	2.28		3.95	1.40
Fresh	15.10	7.70	5.25	13.70	6.30	3.85
Processing		3.00	0.40		2.50	-0.10

Florida Grapefruit: Marketing Year Average Prices Received, Crop Years 1995-96 and 1996-97

Variety, Area, and Utilization	1995-96 F.O.B. Packed	1995-96 Equiv. P.H.D	1995-96 Equiv. On-Tree	1996-97 F.O.B. Packed	1996-97 Equiv. P.H.D.	1996-97 Equiv. On-Tree
	Dollars per box					
White Seedless						
Interior		3.36	1.47		2.60	0.65
Fresh	12.30	5.35	3.55	13.50	6.60	4.80
Processing		3.12	1.22		2.18	0.22
Indian River		4.95	2.59		3.86	1.52
Fresh	17.00	8.30	6.35	16.00	7.30	5.35
Processing		3.13	0.55		2.19	-0.34
Colored Seedless						
Interior		3.99	2.05		4.34	2.30
Fresh	11.70	5.25	3.50	12.30	5.80	4.05
Processing		2.33	0.14		2.70	0.34
Indian River		3.78	1.65		3.92	1.72
Fresh	12.60	4.65	2.75	12.80	4.80	2.90
Processing		2.34	-0.16		2.75	0.13

K-Early Citrus: Marketing Year Average Prices Received, Crop Year 1997-98

State and	1997-98

Utilization	F.O.B. Packed	Equiv. P.H.D.	Equiv. On-Tree
	Dollars per box		
K-Early Citrus			
FL		1.00	-145
Fresh	8.00	0.50	-1.90
Processing		2.50	-0.10

Florida Grapefruit: Marketing Year Average Prices Received, Crop Year 1997-98

Variety, Area, and Utilization	1997-98 F.O.B. Packed	1997-98 Equiv. P.H.D	1997-98 Equiv. On-Tree
	Dollars per box		
White Seedless			
Interior		1.65	-0.25
Fresh	12.90	5.80	4.00
Processing		1.22	-0.69
Indian River		3.47	0.93
Fresh	16.40	7.60	5.65
Processing		1.23	-1.62
Colored Seedless			
Interior		3.18	1.11
Fresh	12.00	5.40	3.65
Processing		1.25	-1.11
Indian River		3.09	0.78
Fresh	12.60	4.50	2.60
Processing		1.25	-1.60

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
			Dollars per Cwt			
Asparagus						
MI	69.00	67.00	71.00	79.00	80.00	65.00
NJ	101.00	98.00	112.00	107.00	107.00	84.20
WA	102.00	98.00	109.00	114.00	108.00	101.00
Oth Sts 1/	94.80	101.00	116.00	85.50	109.00	139.00
US	95.70	100.00	113.00	92.90	108.00	126.00
Broccoli						
AZ	31.30	21.10	38.30	25.70	35.70	35.80
CA 2/	26.20	28.10	28.50			
Oth Sts 3/	32.50	23.80	37.70	27.20	28.40	30.40
US	26.60	27.50	29.30	27.10	29.10	30.80
Carrots						
AZ	11.30	11.70	17.60	12.70	13.30	12.50
CA	11.10	12.70	16.60	13.60	13.00	11.50
CO	8.60	10.00	13.50	7.10	10.00	10.60
FL	16.70	12.70	20.90	14.90	13.60	16.20
MI	12.30	15.10	16.80	11.80	12.50	13.10
MN	10.00	14.90	16.60	12.50	8.60	56.00
NY	16.00	16.00	14.00	15.00	16.00	16.00
TX	14.60	11.50	19.80	15.30	17.30	20.50
WA	13.60	17.40	16.80	15.00	14.00	14.10
Oth Sts 4/	22.90	21.70	20.40	13.90	13.50	16.00
US	11.70	12.90	16.70	13.40	12.90	12.30
Cauliflower						
AZ	32.50	26.00	36.70	33.00	33.20	45.80
Oth Sts 5/	30.70	29.10	34.30	33.70	30.90	34.60
US	30.90	28.70	34.60	33.60	31.20	36.20
Celery 6/						
CA	14.70	11.80	16.50	10.60	14.80	12.10
MI	12.40	13.20	13.60	11.10	13.30	12.70
NY 7/	36.90					
OH 8/	12.10	11.40	13.30	12.20	24.00	
TX	20.60	9.50	13.80	7.30	12.70	13.90
US	14.80	11.80	16.30	10.50	14.70	12.20

1/ CA, IL, IN, MD, MN and OR.
2/ Combined with other states after 1995.
3/ 1991-95:OR and TX; 1996-98:CA and TX.
4/ 1991-94:NJ, OH and WI; 1995-98:NJ, OH and OR.

5/ 1991-94; MI, NY, OR and TX. 1995-98; CA, MI, NY, OR and TX.
6/ Includes processing.
7/ Estimates discontinued beginning 1994.
8/ Estimates discontinued beginning 1998.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Sweet Corn						
AL	12.00	15.00	15.70	13.30	17.00	16.00
CA	17.80	18.30	18.70	17.60	17.20	15.80
CO	10.50	10.80	8.60	9.20	8.70	11.00
CT	27.50	25.00	28.00	27.00	24.00	27.00
FL	20.60	19.60	22.30	17.90	21.30	18.30
GA	14.90	16.50	12.50	11.10	10.70	12.90
IL	14.40	14.00	15.30	14.80	14.60	17.60
IN	18.30	18.80	18.60	20.20	21.70	21.10
ME	26.90	29.90	29.00	30.00	33.00	33.00
MA	25.00	27.00	27.00	28.00	26.00	30.00
MI	16.20	15.00	15.70	17.00	17.80	17.20
NH	31.00	32.00	33.00	32.00	36.00	38.00
NJ	19.00	16.90	16.60	21.90	20.10	19.40
NY	11.90	12.70	18.90	14.80	14.90	18.10
NC	17.80	15.30	14.70	13.50	13.50	13.40
OH	16.30	14.50	18.50	17.10	17.40	18.60
OR	22.10	16.80	16.80	13.00	14.00	11.00
PA	19.70	17.80	19.50	20.50	28.30	29.50
RI	21.00	29.00	27.00	26.00	27.00	33.00
TX	18.00	10.80	16.00	10.00	14.80	19.50
VT	25.50	26.00	25.00	28.00	26.00	28.00
VA	13.00	23.50	17.70	16.80	17.80	34.00
WA	11.90	10.80	12.00	15.00	11.10	13.20
WI 1/		13.50	12.00	13.70	13.40	15.40
US	17.80	17.20	18.30	16.90	17.70	17.60
Honeydew-Melons						
AZ	21.60	18.70	24.10	17.20	18.50	15.20
CA	16.70	16.10	18.70	16.50	18.50	19.30
TX	21.50	16.40	24.60	19.30	22.60	38.10
US	18.20	16.40	20.60	17.00	18.90	20.30
Lettuce						
AZ						
Yuma	14.40	9.20	20.70	13.10	11.60	16.20
Other	12.80	15.20	29.00	13.60	18.00	23.60

CA	16.50	14.60	25.00	15.40	19.40	14.70
CO	10.80	8.90	7.70	7.00	14.60	10.80
FL 2/	19.30	10.10				
NJ	20.10	26.60	24.30	22.60	27.10	32.20
NM	13.50	18.90	14.90	12.40	22.40	9.35
NY	15.70	15.90	15.50	13.00	15.00	20.00
TX 3/	10.00					
WA	13.80	12.00	16.80	10.00	15.10	14.30
US 4/	16.00	13.30	23.50	14.70	17.60	15.20

1/ Estimates began with the 1994 crop.
2/ Estimates discontinued after the 1994 crop.
3/ Estimates discontinued after the 1993 crop.
4/ Excludes Hawaii.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Onions						
AZ						
Spring	16.40	7.70	7.90	8.60	1260	15.30
CA						
Spring	18.00	8.00	14.00	9.80	14.30	14.10
Summer 1/	8.00	6.30	7.20	7.70	7.84	9.20
CO	21.70	13.20	11.20	13.60	12.50	16.20
GA						
Spring	29.70	20.70	28.10	30.50	25.60	30.90
ID, E-OR	19.60	13.10	8.20	10.20	12.60	14.40
MI	14.40	8.60	9.20	10.80	8.90	11.00
MN	10.50	5.70	9.10	8.00	8.13	8.00
NM						
Non-Strg	10.80	9.70	12.90	13.70	14.40	13.00
NV	27.00	14.00	13.00	14.50	14.50	14.00
NY	21.40	13.00	13.80	9.80	12.70	16.30
OH	14.40	10.40	10.40	8.00	9.00	9.30
OR- Malheur	19.60	13.10	8.40	10.10	12.60	13.00
OR- West	22.00	12.20	11.00	9.10	15.60	13.40
TX						
Spring	26.20	10.70	19.20	9.70	16.90	21.70
Non-Strg	19.00	17.30	13.30	12.90	14.00	23.40
UT	17.70	9.10	6.40	8.00	8.84	11.00
WA						
Storage	21.00	13.10	7.80	9.14	12.10	11.50
Non-Strg	19.50	17.70	15.40	21.20	17.40	26.00

WI	13.90	5.30	7.90	10.50	6.00	7.60
US						
All	14.30	9.80	9.90	10.50	12.60	13.80
Spring	22.40	11.30	18.60	13.20	18.40	20.00
Summer 2/	12.80	9.50	8.20	9.95	11.40	12.60
Storage 3/	15.50	10.50	8.90	9.39	12.30	13.30
Non-Strg	14.20	12.00	13.10	14.10	14.50	15.90

1/ Summer crop primarily processing.
2/ Includes CA storage onions.
3/ Excludes CA storage onions.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Strawberries						
AR	55.00	65.00	70.00	75.00	85.00	65.00
CA	46.80	59.10	57.40	52.50	61.40	55.80
FL						
Winter	74.70	60.30	70.60	72.20	82.60	100.00
LA	49.00	47.00	57.00	61.00	60.00	70.00
MI	74.40	70.00	71.00	78.00	80.00	74.60
NJ	85.50	54.20	60.30	68.80	83.30	44.20
NY	136.00	112.00	107.00	120.00	101.00	115.00
NC	60.70	60.10	64.10	67.00	70.00	75.00
OH	74.00	80.00	84.00	89.00	93.00	100.00
OR	65.00	65.00	60.40	75.30	86.00	51.00
PA	108.00	95.00	90.00	97.00	77.30	109.00
WA	78.00	77.00	69.00	85.00	96.00	50.30
WI	80.00	86.00	94.00	98.00	102.00	108.00
US	54.00	60.20	60.40	5650	65.60	60.90
Tomatoes						
AL	27.80	19.20	25.10	22.00	24.00	31.00
AR	23.00	31.00	42.00	38.00	34.00	34.50
CA	26.30	24.80	18.70	24.80	26.50	32.80
FL	35.40	27.40	27.60	30.90	35.50	36.70
GA	26.00	27.00	31.00	24.30	25.70	31.50
IN	37.80	38.00	40.90	46.20	43.80	52.00
LA	37.00	40.00	37.00	40.00	50.00	45.00
MD	30.00	32.30	41.00	35.00	28.00	32.00
MA	60.00	60.00	75.00	85.00	80.00	100.00
MI	32.30	31.40	30.40	24.20	24.20	38.50

NJ	32.30	44.20	33.00	33.80	36.70	39.20
NY	36.00	36.90	24.60	22.10	29.10	29.00
NC	20.90	22.80	19.90	27.00	24.50	27.00
OH	35.80	30.50	28.40	26.60	46.00	38.70
PA	21.50	20.00	18.50	19.50	25.00	26.00
SC	35.00	34.00	33.00	33.00	35.10	27.00
TN	27.00	27.00	21.00	24.00	27.00	38.00
TX	26.00	21.60	28.00	18.00	34.00	37.80
VA	33.50	31.10	31.00	24.70	33.80	35.00
US 1/	31.50	27.40	25.50	28.10	31.70	35.00

1/ Excludes Hawaii.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Snap Beans						
CA	49.90	57.20	50.20	47.80	52.00	62.90
FL	46.70	46.70	37.40	52.10	49.90	59.00
GA	25.00	28.00	28.00	32.00	30.00	28.00
MD	33.00	32.00	36.50	27.00	30.00	40.00
MI	29.00	23.80	27.10	38.20	29.80	61.00
NJ	27.70	34.00	35.00	32.80	33.60	37.00
NY	28.70	28.10	38.50	49.30	54.80	50.60
NC	26.00	29.00	29.00	30.00	25.00	30.00
OH	34.90	27.30	37.00	28.50	31.00	29.30
SC	38.00	38.50	42.60	45.00	36.00	46.00
TN	24.30	28.60	29.20	29.10	26.50	31.40
VA	23.80	26.20	26.80	20.50	18.40	21.00
Total	37.40	37.70	36.50	41.90	40.50	48.20
HI	90.50	102.00	100.00	100.00	105.00	81.00
US	37.40	37.70	36.50	42.00	40.60	48.20
Cabbage						
CA	13.70	13.40	15.50	12.60	14.90	16.10
CO	8.90	7.80	6.20	8.50	7.20	8.20
FL	14.90	10.50	9.00	11.20	14.50	13.00
GA	9.80	9.00	12.00	10.60	8.00	8.30
IL	8.80	9.10	6.70	8.70	9.00	8.25
MD	20.00	13.20	20.00	24.00	14.00	13.00
MI	9.60	8.80	12.00	9.00	7.80	13.30

NJ	14.00	11.30	11.80	15.30	12.40	14.20
NY 1/	8.90	8.50	8.90	8.10	9.70	11.90
L I	10.70					
UPST	8.75					
NC	9.00	9.50	8.50	9.00	8.50	9.50
OH	12.30	9.10	10.50	12.00	11.00	12.20
PA	11.80	10.50	11.50	10.50	13.00	14.00
TX	13.80	7.40	15.00	10.00	11.70	20.40
VA	6.50	7.60	9.20	9.00	8.00	8.00
WI	5.60	3.90	7.40	4.80	6.90	6.85
Total	11.40	9.30	11.50	10.10	11.00	13.10
HI	19.00	21.00	21.50	18.00	21.00	18.00
US	11.40	9.30	11.50	10.20	11.10	13.10
Cantaloups						
AZ	17.10	17.80	20.10	20.80	19.20	14.90
CA	15.30	15.90	17.30	17.90	17.70	18.00
CO	9.70	12.80	12.30	10.80	15.00	13.40
GA	8.30	7.50	14.00	11.90	11.70	16.80
IN	13.60	11.60	12.20	14.60	16.00	16.80
MD	22.00	25.00	27.00	31.00	21.00	20.00
MI	17.00	15.60	16.30	17.00	19.80	19.00
OH	13.10	12.20	12.50	14.80	17.00	18.20
PA	17.80	19.20	17.50	16.50	16.50	17.00
TX	17.40	22.20	23.20	18.70	20.00	31.90
US	15.60	16.50	18.20	18.20	18.00	18.50

1/ Estimates by production area discontinued beginning 1994.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Watermelons						
AL	5.50	4.80	7.30	4.00	6.10	7.20
AZ	7.30	5.60	11.40	7.20	7.80	8.00
AR	4.90	4.70	8.00	6.00	5.00	6.50
CA	8.00	9.90	14.30	10.50	10.90	12.30
DE	6.00	4.40	8.40	5.20	5.20	8.50
FL	8.00	6.80	7.60	7.00	7.30	8.35
GA	450	5.00	6.60	4.00	5.50	5.00
IN	4.60	4.50	5.70	4.60	5.90	7.10

LA	5.20	5.30	6.60	5.10	7.00	6.20
MD	7.00	5.60	10.00	9.00	8.00	8.00
MS	5.00	5.50	7.70	4.70	6.10	6.26
MO	4.00	3.90	6.00	3.20	4.90	5.30
NC	5.10	5.00	6.10	4.50	5.50	5.70
OK	5.90	5.00	7.00	5.90	6.50	7.20
SC	5.00	4.80	5.00	4.00	6.50	6.00
TX	8.40	7.70	10.10	5.50	7.90	5.46
Total	6.90	6.80	8.90	6.30	7.60	7.66
HI	16.00	16.00	16.00	16.50	18.00	21.00
US	6.90	6.80	8.90	6.30	7.60	7.71
Cucumbers						
CA	27.10	24.90	25.90	28.20	24.70	29.80
FL	19.80	14.00	12.40	19.30	20.00	19.10
GA	13.00	18.00	15.00	13.60	12.20	13.90
MD	16.00	15.20	21.50	25.00	21.00	17.00
MI	13.00	11.20	18.00	15.20	14.10	17.30
NJ	16.90	17.50	17.80	15.90	16.80	19.30
NY	12.10	14.70	15.10	17.30	21.40	19.30
NC	11.50	11.00	12.50	13.00	10.00	13.50
SC	21.00	22.60	24.20	23.00	25.00	28.00
TX	12.00	15.00	10.90	13.50	14.50	23.80
VA	11.20	11.90	13.90	12.50	11.50	22.00
Total	18.00	15.90	16.40	18.90	17.60	19.40
HI	46.00	45.50	47.00	43.00	40.00	41.00
US	18.10	16.00	16.50	19.00	17.70	19.50
Bell Peppers						
CA	27.50	25.90	27.10	22.70	24.60	27.20
FL	36.90	34.30	37.50	36.40	42.60	43.60
KY 1/	14.50	15.00				
LA	23.50	23.00	30.00	24.00	25.00	23.00
MI	22.40	20.80	22.70	18.40	20.90	24.00
NJ	25.70	27.90	28.80	25.30	26.40	29.70
NC	20.00	20.50	22.50	21.00	25.00	24.00
OH	2390	23.60	30.60	23.20	30.50	26.90
TX	23.20	46.20	45.30	32.30	34.60	36.00
VA	24.50	25.20	26.70	18.00	28.00	38.00
Total	30.30	29.50	31.40	28.00	32.10	33.80
HI 2/	57.00	53.00	53.00			
US	30.30	29.70	31.40	28.00	32.10	33.80

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1/ Estimates discontinued beginning 1995.

2/ Estimates discontinued beginning 1996.

Vegetables for Fresh Market: Marketing Year Average Prices, by State and United States, 1993-1998

Commodity and State	1993	1994	1995	1996	1997	1998
	Dollars per Cwt					
Leaf Lettuce						
AZ	44.10	23.00	49.10	36.00	31.70	21.00
CA	27.70	28.10	31.90	25.10	28.30	30.80
FL	27.90	20.80	44.70	29.60	29.50	46.00
OH	24.40	19.90	24.20	24.70	25.50	26.10
US	29.50	27.40	34.60	26.80	28.80	29.10
Romaine Lettuce						
AZ	25.50	12.40	28.10	19.50	19.50	21.00
CA	18.60	21.40	24.40	18.60	19.20	22.00
FL	22.40	23.70	26.60	19.10	20.10	40.00
OH	23.70	19.70	23.50	24.70	26.50	24.40
US	19.80	20.10	25.20	18.90	19.40	22.10
Spinach						
CA	31.00	30.80	34.50	30.90	31.20	36.10
CO	29.10	30.00	25.00	28.60	32.00	40.00
MD	42.00	22.00	37.40	15.00	41.00	35.00
NJ	27.10	25.30	30.50	28.20	25.60	36.90
TX	24.00	24.60	25.40	24.40	35.40	39.40
VA 1/	24.50	26.20	26.30			
US	30.30	29.40	32.20	29.30	31.30	36.50
Escarole/Endive						
FL	26.80	30.20	29.50	19.00	25.00	35.00
NJ	22.70	22.00	24.00	24.10	22.30	28.40
OH	22.80	22.00	25.10	25.40	23.00	23.70
US	24.90	26.20	27.50	21.90	23.80	31.30
Eggplant						
FL	25.00	28.90	27.30	28.00	26.00	29.40
NJ	20.20	22.00	18.50	23.60	17.60	25.30
US	23.50	26.80	25.60	26.90	23.90	28.10
Lima Beans						
GA	34.00	29.00	32.00	31.00	33.00	32.00
Artichokes						
CA	50.80	56.40	75.70	73.50	79.50	69.10

Brussels Sprouts :						
CA :	30.90	24.60	25.70	29.40	41.40	43.50
:						
Garlic :						
CA :	31.80	40.10	31.40	32.10	47.10	34.80

1/ Estimate discontinued beginning 1996.

Cattle: Marketing Year Average Prices Received by States and United States, 1997-98

State	Cows 1/		Steers & Heifers		All Beef 2/	
	1997	1998	1997	1998	1997	1998
	Dollars per Cwt					
AL	34.60	33.70	67.20	65.20	57.60	56.00
AK	55.00	57.00	76.00	78.00	62.00	64.00
AZ	36.50	32.10	65.20	61.70	62.10	60.80
AR	33.70	31.90	70.10	65.40	53.90	53.00
CA	33.10	32.90	63.10	61.50	48.80	47.80
CO	37.80	34.80	67.10	63.00	65.20	61.30
CT	35.00	35.00	50.00	50.00	50.00	50.00
DE	36.40	38.10	61.40	60.50	58.90	58.30
FL	34.10	33.40	67.50	65.50	42.20	39.00
GA	33.30	33.10	66.20	63.10	44.50	43.30
HI	28.80	27.20	47.10	47.50	37.70	37.30
ID	32.60	31.90	64.90	62.70	56.80	55.10
IL	36.60	33.60	65.10	60.60	64.50	60.10
IN	37.90	34.30	64.50	59.30	55.80	51.30

IA	:	37.40	35.20	66.70	61.90	62.00
59.80						
KS	:	36.20	33.00	66.30	63.10	65.50
62.30						
KY	:	34.80	34.80	66.90	66.60	59.20
59.00						
LA	:	34.50	33.80	69.20	65.50	45.60
44.10						
ME	:	40.00	40.00	55.00	55.00	55.00
55.00						
MD	:	36.40	38.10	61.40	60.50	58.90
58.30						
MA	:	35.00	35.00	50.00	50.00	50.00
50.00						
MI	:	35.80	34.40	60.60	55.40	50.80
47.70						
MN	:	34.40	34.50	64.00	61.30	61.10
57.30						
MS	:	34.50	33.60	66.50	60.80	48.00
46.00						
MO	:	35.00	33.80	73.90	70.70	64.40
62.30						
MT	:	36.60	34.40	7700	73.10	64.50
62.00						
NE	:	36.60	34.20	67.60	62.70	66.70
61.80						
NV	:	37.40	35.40	63.70	64.00	57.10
57.00						
NH	:	30.00	30.00	55.00	50.00	50.00
45.00						
NJ	:	34.00	34.00	50.00	51.00	38.00
38.00						
NM	:	40.00	37.00	72.70	71.90	59.50
58.00						
NY	:	32.80	32.30	50.30	48.70	34.50
33.80						
NC	:	35.50	34.00	68.20	68.20	50.70
50.10						
ND	:	34.90	35.50	70.50	70.00	60.10
61.40						
OH	:	33.40	32.90	63.60	61.10	60.50
58.40						
OK	:	35.90	33.10	73.60	71.50	68.00
65.30						
OR	:	37.40	35.90	69.20	67.70	59.60
58.10						
PA	:	34.00	34.50	63.60	59.60	56.00
53.10						
RI	:	30.00	40.00	55.00	55.00	50.00
55.00						
SC	:	36.10	29.20	59.50	59.30	54.00
52.40						
SD	:	33.00	34.10	71.60	65.10	64.70
61.80						

TN	33.70	32.90	69.00	67.70	55.40
53.30					
TX	34.10	32.10	67.70	63.70	65.00
61.10					
UT	37.00	34.00	68.00	65.00	65.00
63.00					
VT	35.00	35.00	50.00	45.00	50.00
45.00					
VA	31.00	31.00	65.50	63.00	59.20
57.00					
WA	34.70	33.40	69.80	66.40	65.90
62.80					
WV	29.40	29.10	64.40	62.20	48.20
46.90					
WI	36.10	34.40	62.90	58.20	47.40
44.40					
WY	36.20	34.80	76.50	71.80	70.70
64.60					
Year	United States				
1998	33.70		62.80		59.60
1997	34.80		66.80		63.10

See footnote at end of table.

continued

Cattle: Marketing Year Average Prices Received by States and United States, 1997-98 (continued)

State	Calves		Milk Cows 3/	
	1997	1998	1997	1998
	Dollars per Cwt		Dollars per Head	
AL	79.10	75.10	1090	1110
AK	79.00	79.00	1200	1340
AZ	83.40	82.00	1220	1240
AR	78.80	77.80	1010	1010

CA	:	68.10	70.90	1240
1270				
CO	:	86.20	84.10	1180
1210				
CT	:	40.00	40.00	1070
1150				
DE	:	63.50	71.50	1150
1150				
FL	:	81.20	78.60	1180
1200				
GA	:	78.40	73.00	1150
1150				
HI	:	43.00	49.00	1190
1120				
ID	:	76.40	77.40	1140
1160				
IL	:	102.00	99.80	1110
1130				
IN	:	75.30	70.90	1050
1070				
IA	:	76.00	75.60	1070
1100				
KS	:	86.40	86.60	1130
1100				
KY	:	72.20	74.90	1030
1030				
LA	:	76.70	77.40	1050
1050				
ME	:	30.00	40.00	900
1070				
MD	:	63.50	71.50	1140
1140				
MA	:	35.00	35.00	1070
1210				
MI	:	54.00	51.70	1090
1130				
MN	:	64.00	68.80	1020
1050				
MS	:	72.50	69.00	1040
1040				
MO	:	81.80	79.50	940
980				
MT	:	84.70	78.60	1090
1150				
NE	:	86.00	83.80	1170
1140				
NV	:	73.00	77.70	1200
1250				
NH	:	35.00	40.00	1070
1220				
NJ	:	54.00	57.00	1250
1300				
NM	:	67.30	80.00	1180
1190				

NY	:	48.20	51.90	1000
1010				
NC	:	72.80	72.40	1130
1140				
ND	:	75.50	77.90	960
1020				
OH	:	65.30	65.80	1080
1080				
OK	:	84.00	81.90	1040
1050				
OR	:	72.50	76.00	1150
1160				
PA	:	70.30	79.50	1110
1110				
RI	:	35.00	35.00	1000
1200				
SC	:	76.50	74.60	1160
1170				
SD	:	83.70	85.10	1020
1100				
TN	:	75.30	77.70	1050
1060				
TX	:	86.30	84.00	1110
1130				
UT	:	80.00	81.00	1120
1110				
VT	:	25.00	30.00	1080
1080				
VA	:	70.30	73.30	1190
1160				
WA	:	81.30	79.10	1190
1190				
WV	:	67.40	65.90	1050
1080				
WI	:	98.00	98.00	1060
1070				
WY	:	88.90	84.90	1050
1080				
Year	:	United States		
1998	:	78.80		1120
1997	:	78.90		1100

1/ Beef Cows and cull Dairy Cows sold for slaughter. 2/ "Cows" and "Steers and Heifers" combined. 3/ Calendar year average.

Hogs: Marketing Year Average Prices Received

by States and United States, 1997-98

State	Barrows & Gilts		Sows		All	
	1997	1998	1997	1998	1997	1998
	Dollars per Cwt					
AL	50.00	31.60	42.80	25.00	48.70	30.40
AK	64.00	68.70	37.00	40.50	57.30	64.00
AZ	50.50	29.20	42.50	22.50	49.90	29.10
AR	50.00	32.00	41.00	25.00	48.00	30.00
CA	54.70	34.00	35.10	25.30	54.70	34.00
CO	56.20	37.20	47.20	26.30	55.60	36.40
CT	48.00	40.00	37.00	18.00	47.00	38.00
DE	46.10	33.00	40.60	24.10	45.70	32.10
FL	46.40	31.20	40.50	23.20	45.20	28.00
GA	49.20	33.40	43.20	25.20	48.60	32.40
HI	83.80	85.20	40.20	44.80	80.30	83.10
ID	53.00	37.50	43.00	27.00	52.00	37.00
IL	51.80	33.30	43.50	23.60	51.10	32.50
IN	52.20	33.50	44.90	24.20	51.50	32.60
IA	55.10	36.50	47.30	26.30	54.90	36.30
KS	51.70	33.30	45.70	25.70	50.90	32.40
KY	53.00	35.70	43.30	24.70	52.60	35.20
LA	50.00	31.90	38.70	20.70	47.00	29.10
ME	48.00	40.00	37.00	18.00	47.00	38.00
MD	46.10	33.00	40.60	24.10	45.70	32.10
MA	48.00	40.00	37.00	18.00	47.00	38.00
MI	54.50	35.60	42.00	22.30	53.10	33.90
MN	54.70	35.90	45.40	26.20	54.30	35.50
MS	52.50	33.75	45.70	26.35	52.40	33.70
MO	51.30	32.60	44.60	25.60	50.90	32.00
MT	57.00	41.30	40.00	29.30	55.30	40.10
NE	55.50	37.30	46.70	25.10	55.40	37.10
NV	55.50	30.60	30.60	23.00	53.10	29.80
NH	48.00	40.00	37.00	18.00	47.00	38.00
NJ	42.00	34.00	35.30	23.00	40.00	31.00
NM	49.10	27.80	38.30	22.00	48.70	22.60
NY	46.40	33.00	36.60	19.80	45.40	31.70
NC	53.20	34.10	45.90	26.40	53.10	34.00
ND	48.20	31.60	42.00	21.80	46.30	28.10
OH	53.80	35.50	42.90	2610	53.20	35.10
OK	50.60	33.50	42.50	24.00	50.00	32.00
OR	57.20	38.00	43.50	27.70	56.90	37.80
PA	52.00	33.70	42.20	22.90	50.50	32.00
RI	48.00	40.00	37.00	18.00	47.00	38.00
SC	49.70	33.10	44.30	26.00	49.40	32.60
SD	55.30	36.80	43.50	24.90	53.90	35.30
TN	50.20	33.90	43.30	24.60	49.60	33.00
TX	48.80	31.90	39.60	23.40	47.40	30.70

UT	59.00	40.30	40.30	29.00	58.80	40.20
VT	48.00	40.00	37.00	18.00	47.00	38.00
VA	51.80	34.80	40.80	23.10	51.60	34.60
WA	52.10	37.60	34.10	19.60	50.90	36.60
WV	50.40	36.60	40.20	24.60	47.50	34.00
WI	51.70	33.20	41.50	21.80	50.40	31.80
WY	52.40	33.10	44.20	24.40	50.60	31.10
US	53.50	35.00	44.20	24.70	52.90	34.40

Sheep: Marketing Year Average Prices Received by States and United States, 1997-98

State	Lambs		Sheep	
	1997	1998	1997	1998
	Dollars per Cwt			
AL	85.00	70.00	37.00	32.00
AK	95.00	82.00	60.00	55.00
AZ	92.00	75.00	45.00	36.00
CA	91.60	75.00	33.80	30.50
CO	89.80	72.20	36.10	30.00
CT	115.00	120.00	40.00	37.00
ID	86.40	65.90	33.10	30.50
IL	85.00	66.00	32.20	28.50
IN	85.20	69.60	36.20	32.10
IA	87.00	69.30	35.60	27.80
KS	86.90	72.00	32.60	29.30
KY	85.00	70.00	32.00	29.00
LA	88.00	70.60	41.50	35.20

ME	:	120.00	110.00	45.00
45.00				
MD	:	94.40	79.10	42.10
36.00				
MA	:	120.00	115.00	40.00
38.00				
MI	:	84.00	69.00	35.00
32.00				
MN	:	90.80	71.40	33.80
27.20				
MO	:	84.00	69.00	35.90
30.00				
MT	:	97.80	73.60	37.40
29.20				
NE	:	90.90	74.80	35.10
31.10				
NV	:	84.20	69.00	29.40
25.00				
NH	:	115.00	105.00	40.00
37.00				
NJ	:	100.00	90.00	49.00
41.00				
NM	:	92.00	74.50	45.90
36.00				
NY	:	100.00	86.70	40.20
37.30				
NC	:	93.00	78.60	36.20
30.00				
ND	:	90.70	69.10	32.20
24.70				
OH	:	90.10	73.20	34.70
31.90				
OK	:	90.00	70.00	38.00
28.00				
OR	:	84.30	66.20	31.20
30.10				
PA	:	91.50	83.60	38.90
34.90				
SD	:	93.20	73.20	37.70
30.10				
TN	:	91.00	76.00	38.00
33.00				
TX	:	90.50	73.30	44.70
37.10				
UT	:	87.20	67.80	32.70
27.00				
VT	:	105.00	105.00	40.00
30.00				
VA	:	91.00	72.20	31.20
30.40				
WA	:	84.00	66.10	31.40
30.00				
WV	:	79.90	71.80	26.10
25.50				

WI	87.20	69.10	35.10	32.20
WY	94.30	71.80	38.70	28.70

Year	United States	
1998	72.30	30.60
1997	90.30	37.90

Wool and Mohair: Prices Received, Marketing Year Average, by States, 1997-98 1/

State	Wool		Mohair	
	1997	1998	1997	1998
	Dollars per Pound			
AL	.48	.38		
AK	1.00	.90		
AZ	.58	.47	1.70	1.25
CA	.79	.61		
CO	.89	.53		
CT	.55	.55		
ID	.74	.66		
IL	.43	.25		
IN	.34	.26		
IA	.42	.26		
KS	.58	.42		
KY	.41	.32		
LA	.58	.33		
ME	.50	.55		
MD	.68	.50		
MA	.60	.40		
MI	.44	.31		
MN	.43	.34		
MO	.45	.33		
MT	1.01	.78		
NE	.52	.41		
NV	.90	.58		
NH	.65	.70		
NJ	.55	.50		
NM	1.07	.89	1.90	1.30
NY	.54	.45		

NC	.59	.49		
ND	.76	.55		
OH	.43	.32		
OK	.58	.39	2.00	1.75
OR	.61	.48		
PA	.53	.47		
SD	.90	.59		
TN	.50	.45		
TX	1.06	.63	2.28	2.59
UT	.75	.62		
VT	.65	.50		
VA	.58	.44		
WA	.65	.55		
WV	.61	.51		
WI	.53	.39		
WY	.98	.77		
Oth 2/	.55	.45		
US	.84	.60	2.25	2.48

1/ Average local market for wool and mohair sold.
2/ Includes AR, DE, FL, GA, MS, RI and SC.

Poultry: Marketing Year Average Prices Received by States and United States, 1997-98 1/

State	Broilers 2/		Other Chickens		Turkeys 3/	
	1997	1998	1997	1998	1997	1998
	Dollars per Pound					
AL	.380	.400	.170	.175		
AR	.375	.380	.090	.096	.41	.40
CA	.390		.023	.034	.42	.41
CO			.030	.030		
CT			.025	.017	1.07	1.00
DE	.375	.390	.102	.129	4/	4/
FL	.385	.400	.002	.058		
GA	.385	.405	.160	.169	.45	
HI	.520	.525	.149	.151		
ID			.030	.036		

IL	:			.059	.027	.41
.39						
IN	:			.020	.020	.41
.39						
IA	:			.031	.024	.43
KS	:			.050	.020	.41
KY	:	.370	.395	.050	.113	
LA	:			.072	.069	
ME	:			.020	.017	
MD	:	.375	.390	.056	.062	4/
4/						
MA	:			.020	.017	1.28
1.25						
MI	:	.365	.365	.040	.027	
MN	:	.375	.390	.031	.026	.39
.35						
MS	:	.370	.395	.144	.174	
MO	:	.375	.380	.090	.096	.40
.40						
MT	:			.020	.020	
NE	:	.375	.390	.031	.024	
NH	:			.025	.017	1.35
1.40						
NJ	:			.040	.036	.85
.80						
NM	:			.005	.005	
NY	:	.390	.410	.026	.021	.42
.40						
NC	:	.375	.395	.110	.070	.39
.37						
ND	:			.031	.026	.39
.35						
OH	:	.365	.390	.013	.024	.35
.33						
OK	:	.375	.380	.090	.096	
OR	:	.385		.020	.010	
PA	:	.375	.385	.075	.073	.41
.38						
RI	:			.025	.016	
SC	:	.385	.395	.111	.111	.39
.38						
SD	:			.030	.020	.40
.35						
TN	:	.380	.395	.120	.133	
TX	:	.370	.390	.036	.039	
UT	:			.030	.030	
VT	:			.025	.016	1.18
1.04						
VA	:	.365	.385	.110	.070	.39
.39						
WA	:	.385		.020	.020	
WV	:	.365	.400	.110	.130	.39
.39						
WI	:	.375	.365	.059	.051	

WY	:		.050	.050		
	:					
Oth Sts 5/	:	.385	.393	.020	.035	.41 .39
	:					
US	:	.377	.393	.077	.080	.399 .380

1/ 1997 revised. 2/ Equivalent liveweight returns to producers. Derived from ready-to-cook (RTC) prices using the following formula: (RTC price minus processing cost)*(dressing percentage) = equivalent liveweight price.
3/ IN,IA,MN and PA are actual liveweight prices. All other State prices are equivalent liveweight returns to producers. (See footnote 2 for formula.)
4/ DE and MD combined price was $0.43 for 1997 and 1998. 5/ Combined to avoid disclosure of individual operations. Broilers-1997: IA,IL,IN and ME.
Broilers-1998: CA,IA,IN,LA,ME,OR and WA. Other Chickens 1997 and 1998: AK and NV. Turkeys-1997: MI,NE,OK,OR,TX,UT and WI; Turkeys-1998:
CO,GA,IA,KS,MI,NE,OK,OR,TX,UT and WI.

Eggs: Marketing Year Average Prices Received by States and United States, 1/

State	Market Eggs 2/		All Eggs 3/	
	1997	1998	1997	1998
	Dollars per Dozen			
AL	.559	.490	1.060	1.030
AR	.600	.462	1.030	.978
CA	.611	.549	.621	.561
CO	.650	.600	.720	.671
CT	.579	.566	.598	.589
DE	.660	.593	1.150	1.380

FL	:	.561	.491	.594	.535
GA	:	.592	.525	.885	.880
HI	:	.906	.871	.906	.871
ID	:	.560	.545	.707	.696
IL	:	.568	.507	.622	.618
IN	:	626	.574	.637	.588
IA	:	.496	.420	.526	.452
KS	:	.534	.452	.566	.468
KY	:	.549	.540	.744	.725
LA	:	.636	.538	.908	.848
ME	:	.686	.617	.694	.630
MD	:	.653	.597	.732	.697
MA	:	.610	.637	.610	.642
MI	:	.560	.500	.560	.500
MN	:	.530	.450	.559	.480
MS	:	.658	.600	1.130	1.210
MO	:	.503	.420	.592	.530
MT	:	.570	.550	.570	.550
NE	:	.520	.430	.520	.430
NH	:	.639	.640	.825	.750
NJ	:	.623	.570	.623	.570
NM	:	.593	.550	.593	.550
NY	:	.653	.610	.666	.620
NC	:	.540	.470	.875	.890
ND	:	.530	.450	.530	.450
OH	:	.608	.560	.614	.570
OK	:	.607	.460	.873	.780

OR	.620	.560	.644	.590	
PA	.618	.580	.653	.610	
RI	.589	.639	.589	.639	
SC	.593	.509	.768	.696	
SD	.500	.430	.500	.430	
TN	.597	.571	.931	.926	
TX	.595	531	.768	.715	
UT	.576	.520	.576	.520	
VT	.665	.563	.608	.628	
VA	.645	.577	.951	.933	
WA	.624	.589	.653	.594	
WV	.643	.575	1.210	1.250	
WI	.524	.476	.564	.514	
WY	.630	.570	.630	.570	
Oth Sts 4/	.610	.545	.610	.545	
US	.587	.524	.703	.655	

1/ 1997 Revised
2/ Market (table) eggs.
3/ Average of all eggs including hatching-type eggs.
4/ Combined to avoid disclosure of individual operations.

Milk: Annual Average Prices Received by States, 1997-98, and United States, 1993-98

State	Sold to Plants			Retailed by Farmers
	Eligible for Fluid Market 1/	Manufacturing Grade	All Milk	

	1997	1998	1997	1998	1997	1998	1997	1998
	Dollars per Cwt						Dollars per Quart	
AL	14.80	16.50			14.80	16.50		
AK	20.30	20.30			20.30	20.30	.75	.90
AZ	13.00	14.60			13.00	14.60		
AR	14.50	15.60			14.50	15.60		
CA	12.62	15.02	12.61	14.99	12.62	15.01	.85	1.10
CO	13.00	15.00			13.00	15.00	.82	.90
CT	14.60	16.00			14.60	16.00	.75	.80
DE	13.80	15.70			13.80	15.70		
FL	16.50	18.20			16.50	18.20		
GA	14.70	16.60			14.70	16.60		
HI	24.71	26.36			24.71	26.36		
ID	12.30	14.50	12.00	14.50	12.30	14.50		
IL	13.70	15.10	12.70	14.80	13.60	15.10		
IN	13.10	14.90	11.10	13.00	13.00	14.80		
IA	13.50	15.40	12.30	14.10	13.40	15.40		
KS	12.80	14.70	11.80	13.80	12.80	14.70		
KY	13.80	15.50	11.20	13.20	13.70	15.50		
LA	14.30	16.20			14.30	16.20		
ME	14.50	15.80			14.50	15.80	.57	.57
MD	13.80	15.70			13.80	15.70		
MA	14.70	16.40			14.70	16.40	.75	.70
MI	13.60	15.30	11.10	13.70	13.60	15.30	.65	.65
MN	13.31	15.65	11.95	14.24	13.19	15.55		
MS	14.40	16.20			14.40	16.20		
MO	13.70	15.70	12.00	14.10	13.70	15.60		
MT	13.20	15.00			13.20	15.00		
NE	13.30	15.20	12.20	14.40	13.20	15.10		
NV	11.90	13.80			11.90	13.80		
NH	14.60	16.30			14.60	16.30		
NJ	13.80	15.60			13.80	15.60		
NM	12.90	14.80			12.90	14.80	.79	.88
NY	13.40	15.40			13.40	15.40	.63	.69
NC	15.10	17.00	11.20	13.50	15.10	16.90		
ND	13.00	15.00	11.50	13.10	12.40	14.30		
OH	13.40	15.40	11.50	13.10	13.30	15.20		
OK	13.80	15.60			13.80	15.60		
OR	13.20	15.50	12.80	14.90	13.20	15.50	.60	.60

PA	14.00	15.80	11.90	14.30	14.00	15.80	.58 .58
RI	14.50	16.30			14.50	16.30	
SC	14.50	16.40			14.50	16.40	.78 .87
SD	13.60	16.00	12.80	14.90	13.20	15.50	
TN	14.10	15.90	11.50	13.30	14.10	15.90	
TX	13.70	15.70			13.70	15.70	
UT	12.40	14.60	11.70	14.00	12.30	14.60	.67 .68
VT	14.30	16.00			14.30	16.00	.70 .69
VA	14.00	16.20	10.70	14.50	14.00	16.20	
WA	13.20	15.40			13.20	15.40	.64 .64
WV	13.50	15.40			13.50	15.40	
WI	13.39	15.55	12.48	14.72	13.33	15.50	
WY	12.50	13.60	11.10	13.90	12.20	13.70	

Year	United States			
1998	15.44	14.33	15.41	.814
1997	13.40	12.17	13.36	.733
1996	14.79	13.43	14.75	.785
1995	12.80	11.79	12.78	.647
1994	13.02	11.85	13.01	.617
1993	12.88	11.80	12.84	.585

1/ Includes surplus fluid grade milk diverted to manufacturing.

Milk: Annual Average Fat Test by States, 1997-98, and United States, 1993-98

State	Eligible for Fluid Market 1/		Manufacturing Grade		All Milk	
	1997	1998	1997	1998	1997	1998
	Percent					
AL	3.59	3.66			3.59	3.66
AK	3.37	3.36			3.37	3.36
AZ	3.56	3.57			3.56	3.57

AR	:	3.53	3.60			3.53
3.60						
CA	:	3.64	3.66	4.04	4.01	3.64
3.67						
CO	:	3.60	3.62			3.60
3.62						
CT	:	3.64	3.62			3.64
3.62						
DE	:	3.67	3.69			3.67
3.69						
FL	:	3.58	3.58			3.58
3.58						
GA	:	3.58	3.61			3.58
3.61						
HI	:	3.42	3.43			3.42
3.43						
ID	:	3.53	3.56	3.74	3.71	3.54
3.57						
IL	:	3.70	3.69	3.78	3.69	3.71
3.69						
IN	:	3.69	3.66	3.71	3.70	3.69
3.67						
IA	:	3.72	3.72	3.74	3.76	3.72
3.73						
KS	:	3.65	3.64	3.68	3.69	3.65
3.64						
KY	:	3.60	3.61	3.69	3.73	3.60
3.62						
LA	:	3.47	3.46			3.47
3.46						
ME	:	3.64	3.62			3.64
3.62						
MD	:	3.67	3.69			3.67
3.69						
MA	:	3.70	3.69			3.70
3.69						
MI	:	3.65	3.63	3.67	3.66	3.65
3.63						
MN	:	3.73	3.69	3.73	3.70	3.73
3.70						
MS	:	3.55	3.60			3.55
3.60						
MO	:	3.63	3.64	3.76	3.73	3.64
3.64						
MT	:	3.54	3.57			3.54
3.57						
NE	:	3.69	3.69	3.73	3.71	3.69
3.69						
NV	:	3.59	3.59			3.59
3.59						
NH	:	3.77	3.73			3.77
3.73						
NJ	:	3.62	3.53			3.62
3.53						

NM	:	3.50	3.51			3.50
3.51						
NY	:	3.67	3.66			3.67
3.66						
NC	:	3.64	3.67	3.87	3.92	3.64
3.67						
ND	:	3.67	3.66	3.65	3.69	3.66
3.67						
OH	:	3.69	3.69	3.75	3.75	3.69
3.69						
OK	:	3.58	3.55			3.58
3.55						
OR	:	3.64	3.64	4.25	4.22	3.65
3.65						
PA	:	3.62	3.70	3.71	3.76	3.62
3.70						
RI	:	3.50	3.70			3.50
3.70						
SC	:	3.66	3.66			3.66
3.66						
SD	:	3.71	3.72	3.69	3.65	3.70
3.69						
TN	:	3.57	3.64	3.72	3.74	3.57
3.64						
TX	:	3.58	3.57			3.58
3.57						
UT	:	3.60	3.62	3.62	3.69	3.60
3.63						
VT	:	3.72	3.70			3.72
3.70						
VA	:	3.56	3.63	3.58	4.00	3.56
3.64						
WA	:	3.64	3.66			3.64
3.66						
WV	:	3.67	3.69			3.67
3.69						
WI	:	3.77	3.72	3.83	3.80	3.77
3.73						
WY	:	3.61	3.61	3.70	3.65	3.63
3.62						

Year	:	United States		
1998	:	3.65	3.75	3.66
1997	:	3.65	3.77	3.66
1996	:	3.69	3.78	3.69
1995	:	3.65	3.75	3.66
1994	:	3.65	3.76	3.66
1993	:	3.66	3.76	3.66

1/ Includes surplus fluid grade milk diverted to manufacturing.

Honey: Marketing Year Average Prices Received, by States and United States, 1992-98 1/

State	1992	1993	1994	1995	1996	1997	1998
AL	.59	.59	.52	.69	.87	.81	.72
AZ	.55	.52	.51	.65	.85	.72	.64
AR	.52	.50	.51	.71	.85	.70	.59
CA	.52	.50	.51	.63	.84	.70	.62
CO	.59	.58	.56	.73	.85	.82	.70
FL	.53	.50	.47	.64	.86	.73	.64
GA	.66	.61	.57	.71	.88	.79	.69
HI	.54	.52	.48	.56	.81	.86	.75
ID	.52	.52	.52	.69	.88	.72	.65
IL	.88	.96	1.04	1.13	1.35	1.27	1.19
IN	.72	.70	.71	.72	1.03	1.13	.85
IA	.57	.56	.65	.77	.95	.86	.70
KS	.59	.56	.72	.89	.94	.81	.87
KY	.74	.84	.98	1.02	1.28	1.48	1.40
LA	.51	.52	.46	.63	.83	.70	.59
ME	.77	68	.60	.97	1.06	.70	.69
MD	.99	1.47	1.08	1.03	1.21	1.59	1.10
MI	.59	.57	.55	.78	1.01	.77	.66
MN	.54	.53	.52	.70	.90	.74	.65
MS	.51	.49	.48	.68	.87	.73	.58
MO	.65	.59	.53	.73	.92	.78	.76

MT	:	.55	.54	.52	.72	.88	.74
.64							
NE	:	.53	.53	.56	.73	.92	.77
.86							
NV	:	.85	.95	1.08	.90	1.05	1.14
1.65							
NJ	:	.91	.87	.63	.77	.82	1.04
.76							
NM	:	.61	.68	.47	.83	.91	.87
.76							
NY	:	.61	.63	.63	.71	.89	.85
.70							
NC	:	.79	.90	.95	.84	1.04	1.19
1.38							
ND	:	.53	.52	.48	.67	.90	.74
.63							
OH	:	.60	.66	.64	.74	.96	.85
.83							
OK	:	.74	.81	.93	.93	1.09	1.37
1.24							
OR	:	.58	.56	.52	.78	.93	.79
.90							
PA	:	.71	.64	.60	.73	1.02	1.00
.80							
SC 2/	:	.78	.60	.82	1.26	1.16	
SD	:	.53	.52	.52	.71	.90	.74
.64							
TN	:	.74	.93	.98	1.17	1.54	1.47
1.32							
TX	:	.52	.51	.50	.67	.85	.75
.62							
UT	:	.58	.55	.53	.65	.85	.75
.65							
VT	:	.75	.67	.87	.86	1.01	.83
1.07							
VA	:	.71	.81	.65	.67	1.48	1.45
1.33							
WA	:	.58	.61	.54	.57	.90	.76
.64							
WV	:	.85	1.11	1.18	1.18	1.59	1.11
1.14							
WI	:	.58	.59	.60	.70	.90	.90
.72							
WY	:	.54	.53	.58	.73	.90	.75
.68							
	:						
Oth Sts 2/	:	.99	1.23	1.15	1.57	1.63	1.45
1.21							
	:						
US 3/	:	.550	.539	.528	.685	.888	.752
.655							

1/ Prices based on retail sales by producers and sales to private processors and cooperatives. 2/ CT, DE, MA, NH, RI and SC not published separately to avoid disclosure of individual operations. SC included in Other States beginning in 1997. 3/ U.S. prices weighted by survey expanded state sales.

Prices Received: Corn, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Aug	Sep	Oct	Nov	Dec	Jan 2/	Feb
			Dollars per Bushel				
				1997-98			
CO	2.60	2.68	2.65	2.57	2.55	2.65	2.57
GA	2.81	2.78	2.93	3.12	3.16	3.16	3.21
IL	2.65	2.68	2.64	2.61	2.65	2.68	2.67
IN	2.60	2.60	2.62	2.60	2.61	2.66	2.62
IA	2.41	2.44	2.44	2.45	2.45	2.44	2.47
KS	2.60	2.59	2.62	2.54	2.47	2.51	2.54
KY	2.67	2.55	2.67	2.68	2.74	2.76	2.74
MI	2.68	2.66	2.71	2.50	2.44	2.48	2.45
MN	2.29	2.27	2.35	2.35	2.32	2.35	2.36
MO	2.50	2.44	2.48	2.49	2.46	2.54	2.55
NE	2.43	2.42	2.49	2.52	2.44	2.47	2.48
NC	2.95	2.85	2.91	2.89	3.08	3.07	3.06
OH	2.68	270	2.59	2.53	2.56	2.59	2.57
PA	3.07	3.17	3.20	3.12	3.07	3.13	3.04
SD	2.22	2.19	2.22	2.22	2.20	2.22	2.26
TN		2.64	2.74	2.91	3.02	2.76	2.91

TX	:	2.79	2.68	2.79	2.80	2.80	2.78
2.85							
WI	:	2.44	2.41	2.50	2.38	2.37	2.50
2.45							
	:						
US	:	2.50	2.52	2.54	2.51	2.52	2.56
2.55							
	:						
	:				1996-97		
	:						
CO	:	4.49	4.00	2.94	2.91	2.70	2.66
2.67							
GA	:	3.72	3.74	3.29	3.25	3.39	3.34
3.35							
IL	:	4.51	3.50	2.94	2.73	2.78	2.77
2.72							
IN	:	4.55	3.43	2.80	2.69	2.64	2.77
2.73							
IA	:	4.46	3.95	2.84	2.61	2.52	2.59
2.55							
KS	:	4.46	3.52	3.00	2.76	2.71	2.63
2.69							
KY	:	4.08	3.36	2.94	2.78	2.79	3.00
2.85							
MI	:	4.37	4.24	2.66	2.56	2.59	2.64
2.66							
MN	:	3.95	3.56	2.68	2.54	2.44	2.44
2.41							
MO	:	4.39	3.40	2.76	2.59	2.55	2.67
2.65							
NE	:	4.55	3.73	2.92	2.68	2.61	2.66
2.62							
NC	:	4.03	3.65	3.41	3.17	3.18	3.18
3.31							
OH	:	4.85	3.70	2.73	2.67	2.62	2.73
2.78							
PA	:	5.35	4.30	2.94	2.81	2.87	3.08
3.13							
SD	:	4.40	3.69	2.55	2.30	2.36	2.30
2.36							
TN	:						
TX	:	4.00	3.47	3.05	2.92	2.82	2.84
2.85							
WI	:	4.19	4.14	2.92	2.69	2.61	2.56
2.58							
	:						
US	:	4.30	3.56	2.88	2.66	2.63	2.69
2.65							

See footnotes at end of table. --

continued

Prices Received: Corn, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Mar	Apr	May	Jun	Jul	Aug	Sep
	Dollars per Bushel						
	1997-98						
CO	2.61	2.42	2.41	2.81	2.77	2.05	1.87
GA	3.19	2.98	3.02	2.96	2.81	2.35	2.39
IL	2.65	2.49	2.40	2.39	2.30	2.01	1.88
IN	2.61	2.46	2.36	2.29	2.17	1.91	1.96
IA	2.47	2.37	2.28	2.20	2.08	1.81	1.72
KS	2.52	2.38	2.41	2.34	2.21	1.81	1.84
KY	2.75	2.58	2.51	2.48	2.34	2.02	1.94
MI	2.47	2.32	2.25	2.14	2.18	1.98	1.81
MN	2.36	2.29	2.28	2.18	2.02	1.68	1.57
MO	2.58	2.42	2.42	2.34	2.22	1.94	1.67
NE	2.50	2.40	2.32	2.22	2.11	1.83	1.72
NC	3.04	2.95	2.67	2.69	2.57	2.36	2.22
OH	2.56	2.40	2.34	2.27	2.20	1.95	1.90
PA	3.00	2.91	2.82	2.75	2.71	2.54	2.41
SD	2.25	2.20	2.10	2.05	1.91	1.56	1.46
TN	2.99	2.79	2.83	2.84	2.63	2.24	1.96
TX	2.85	2.94	2.62	2.52	2.41	2.40	2.37
WI	2.52	2.35	2.29	2.24	2.19	1.92	1.75
US	2.55	2.41	2.34	2.28	2.19	1.89	1.83
	1996-97						

	:						
CO	:	2.83	2.78	2.75	2.59	2.61	2.60
2.68							
GA	:	3.45	3.43	3.31	3.30	2.99	2.81
2.78							
IL	:	2.87	2.90	2.80	2.64	2.49	2.65
2.68							
IN	:	2.86	2.96	2.86	2.73	2.59	2.60
2.60							
IA	:	2.72	2.72	2.61	2.47	2.34	2.41
2.44							
KS	:	2.84	2.79	2.71	2.63	2.50	2.60
2.59							
KY	:	2.93	3.04	2.94	2.78	2.61	2.67
2.55							
MI	:	2.91	2.90	2.86	2.64	2.63	2.68
2.66							
MN	:	2.59	2.59	2.52	2.48	2.29	2.29
2.27							
MO	:	2.82	2.82	2.73	2.61	2.48	2.50
2.44							
NE	:	2.74	2.75	2.63	2.53	2.42	2.43
2.42							
NC	:	3.34	3.35	3.34	3.11	3.04	2.95
2.85							
OH	:	2.94	2.94	2.83	2.76	2.65	2.68
2.70							
PA	:	3.23	3.21	3.16	3.15	3.03	3.07
3.17							
SD	:	2.51	2.50	2.41	2.33	2.20	2.22
2.19							
TN	:						
2.64							
TX	:	3.01	3.02	2.86	3.07	3.06	2.79
2.68							
WI	:	2.72	2.76	2.71	2.55	2.39	2.44
2.41							
	:						
US	:	2.79	2.80	2.69	2.56	2.42	2.50
2.52							

1/ August - July for GA, LA, MS and TX; September - August for IL, IN, IA, KS, KY, MO, NC, OH and TN; October - September for all other estimated States; September - August for US.

2/ Second year.

Prices Received: Sorghum, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2/
				Dollars per Cwt				
				1997-98				
AR	4.46	4.46	4.60	4.53	4.66	4.45	4.75	4.75
IL	4.24	3.97	4.35	4.21	4.21	4.29	4.25	4.51
KS	4.13	3.84	3.89	3.74	3.94	3.87	3.81	3.91
MO	4.62	4.25	4.22	4.02	3.77	3.84	3.96	4.17
NE	4.07	4.01	4.03	3.82	4.02	4.00	3.88	3.95
OK	4.29	4.16	3.92	3.75	3.95	3.84	3.95	4.12
TX	4.05	3.94	4.14	4.15	4.37	4.25	4.34	4.39
US	4.10	3.95	4.09	4.00	4.06	4.01	3.94	4.02
				1996-97				
AR	4/	4/	5.86	5.33	4.75	4.60	4.06	4.52
IL	4/	4/	4/	3/	4.22	4.00	3.91	4.05
KS	7.50	7.29	6.32	5.22	4.27	3.99	3.81	3.87
MO	7.66	7.46	7.26	5.81	4.19	3.77	3.79	4.34
NE	7.47	7.49	7.19	6.53	4.76	4.27	4.06	4.15
OK	7.96	7.81	6.36	5.27	4.35	4.49	3.90	3.86
TX	6.92	6.55	6.23	5.76	4.64	4.30	4.13	4.26
US	6.85	6.61	6.21	5.57	4.38	4.10	3.93	4.03

See footnotes at end of table. -- continued

Prices Received: Sorghum, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
				Dollars per Cwt				
				1997-98				
AR	4.86	4.46			4.05	4.02	3.30	3.22
IL	4.45	4.36	4.22	4.01	3.88	3/	3/	3/
KS	3.87	3.95	3.73	3.64	3.55	3.30	2.82	2.71
MO	4.15	4.20	3.89	3.91	4.16	3.57	3.21	2.69
NE	4.08	3.95	3.73	3.62	3.65	3.44	2.97	2.77
OK	4.10	4.16	3.74	3.58	3.80	3.81	3.57	3.39
TX	4.48	4.38		4.18	4.28	4.02	3.68	3.56
US	4.05	4.02	3.77	3.69	3.96	3.81	3.32	2.91
				1996-97				
AR	5.15	4.81	4.95			3/	4.60	4.53
IL	4.45	4.70		4.39	3/			4.21
KS	4.04	4.44	4.46	4.25	4.13	3.84	3.89	3.74
MO	4.28	4.57	4.58	4.62	4.62	4.25	4.22	4.02
NE	4.31	4.13	4.12	4.06	4.07	4.01	4.03	3.82
OK	4.07	4.53	4.52	4.34	4.29	4.16	3.92	3.75
TX	4.29	4.66	4.66	4.45	4.05	3.94	4.14	4.15
US	4.17	4.37	4.34	4.18	4.10	3.95	4.09	4.00

1/ June - May for TX; August - July for AR and OK; September - August for

IL, KS and MO; October - September for NE; September - August for US.
2/ Second year.
3/ Price not published to avoid disclosure.
4/ Insufficient sales to establish a price.

Prices Received: Soybeans, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Sep	Oct	Nov	Dec	Jan 2/	Feb
	Dollars per Bushel					
	1997-98					
AR	6.91	6.92	7.10	6.95	7.00	6.77
GA	3/	6.78	6.88	6.72	6.39	6.48
IL	6.86	6.58	6.98	6.93	6.86	6.74
IN	6.54	6.62	6.88	6.68	6.80	6.73
IA	6.66	6.35	6.85	6.67	6.53	6.43
KS	6.67	6.39	6.74	6.65	6.66	6.48
KY	7.02	6.83	7.15	6.94	6.89	6.78
LA	7.15	6.96	6.99	7.10	6.97	6.79
MI	6.89	6.62	6.79	6.58	6.54	6.36
MN	6.48	6.27	6.61	6.68	6.39	6.40
MS	7.20	6.97	6.95	7.01	7.01	6.74
MO	6.66	6.35	6.74	6.58	6.57	6.48
NE	6.64	6.35	6.72	6.60	6.46	6.40
NC	6.90	6.86	6.83	6.72	6.70	6.67
OH	6.74	6.47	6.85	6.69	6.72	6.66
SD	6.11	6.10	6.43	6.31	6.21	6.26
TN	7.27	6.87	7.12	6.90	6.91	6.71

WI	:	6.69	6.50	6.59	6.71	6.49
6.51						
	:					
US	:	6.72	6.49	6.86	6.72	6.69
6.57						
	:					
	:			1996-97		
	:					
AR	:	7.52	7.20	7.25	7.20	7.33
7.65						
GA	:	7.27	6.78	6.72	6.78	6.97
7.60						
IL	:	7.97	7.04	6.94	7.07	7.23
7.48						
IN	:	8.02	6.94	6.90	6.98	7.31
7.34						
IA	:	7.84	6.89	6.80	6.80	6.99
7.27						
KS	:	7.65	6.79	6.65	6.76	6.97
7.33						
KY	:	7.96	7.06	7.06	7.23	7.34
7.63						
LA	:	7.69	7.48	7.11	7.07	7.48
7.71						
MI	:	7.58	6.83	6.80	6.88	7.13
7.44						
MN	:	7.55	684	6.69	6.64	6.86
7.17						
MS	:	7.64	7.29	7.13	7.21	7.19
7.48						
MO	:	7.84	6.88	6.67	6.79	7.05
7.39						
NE	:	7.53	6.82	6.78	6.78	6.96
7.24						
NC	:	7.50	6.83	6.85	6.54	7.11
7.49						
OH	:	8.05	7.00	6.87	7.00	7.23
7.52						
SD	:	7.43	6.63	6.49	6.67	6.84
7.13						
TN	:	7.98	7.22	7.01	7.12	7.29
7.63						
WI	:	7.86	6.85	6.79	6.81	6.97
7.33						
	:					
US	:	7.79	6.94	6.90	6.91	7.13
7.38						

See footnotes at end of table. --
continued

Prices Received: Soybeans, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Mar	Apr	May	Jun	Jul	Aug
	Dollars per Bushel					
	1997-98					
AR	6.58	6.46	6.52	6.39	6.52	5.52
GA	3/	3/	3/	3/	3/	3/
IL	6.52	6.39	6.37	6.31	6.32	5.54
IN	6.57	6.37	6.41	6.42	6.38	5.74
IA	6.36	6.22	6.17	6.09	6.00	5.35
KS	6.27	6.30	6.29	5.99	5.97	5.23
KY	6.57	6.41	6.38	6.30	6.28	5.66
LA	6.61	6.44	6.43	3/	6.43	5.96
MI	6.40	6.12	6.14	5.93	6.06	5.50
MN	6.21	6.14	6.16	5.98	5.95	5.26
MS	6.59	6.33	6.31	6.38	6.76	5.65
MO	6.37	6.21	6.24	6.10	6.06	5.40
NE	6.23	6.09	6.10	5.99	5.94	5.18
NC	6.64	6.43	6.36	6.37	5.92	5.63
OH	6.39	6.29	6.34	6.25	6.30	5.60
SD	6.09	6.09	6.01	5.92	5.74	4.68
TN	6.67	6.40	6.37	6.24	6.16	5.60
WI	6.20	5.70	6.21	6.10	6.09	5.66
US	6.40	6.26	6.26	6.16	6.14	5.43
	1996-97					

AR	8.10	8.44	8.51	8.40	7.38	7.46
GA	8.21	8.41	3/	3/	3/	3/
IL	8.12	8.36	8.61	8.27	7.62	7.52
IN	7.94	8.38	8.60	8.22	7.71	7.18
IA	7.88	8.17	8.39	8.10	7.46	7.08
KS	8.04	8.24	8.27	8.36	7.67	7.17
KY	7.96	8.36	8.72	8.35	7.78	7.55
LA	8.26	3/	3/	3/	7.87	7.14
MI	8.06	8.26	8.62	8.33	7.35	7.51
MN	7.79	8.08	8.23	8.22	7.44	7.02
MS	8.17	8.51	8.45		7.25	7.25
MO	7.98	8.29	8.51	8.32	7.61	7.29
NE	7.71	7.84	7.85	7.70	7.42	6.90
NC	8.31	8.50	8.68		7.79	6.94
OH	8.08	8.41	8.64	8.38	7.73	7.45
SD	7.80	8.06	8.13	8.05	7.34	6.93
TN	8.23	8.38	8.55	8.43		7.41
WI	7.88	8.14	8.42	8.23	7.53	7.08
US	7.97	8.23	8.40	8.16	7.52	7.25

1/ September - August for all estimated States.
2/ Second year.
3/ Price not published to avoid disclosure of individual operations.

Prices Received: Flaxseed, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	Jul	Aug	Sep	Oct	Nov	Dec

	Dollars per Bushel					
			1997-98			
ND	6.08	5.55	5.73	5.78	5.71	5.72
SD 3/						
US	6.08	5.54	5.73	5.78	5.71	5.72
			1996-97			
ND	6.19	6.20	5.87	6.51	6.38	6.77
SD	6.17	6.12	6.27	6.30	6.70	
US	6.19	6.17	5.91	6.50	6.38	6.77

See footnotes at end of table. -- continued

Prices Received: Flaxseed, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel					
			1997-98			
ND	5.83	6.27	6.26	6.23	6.33	6.17
SD 3/						
US	5.82	6.27	6.26	6.23	6.33	6.17
			1996-97			
ND	6.43	6.76	6.67	6.43	6.47	5.99
SD						
US	6.43	6.74	6.66	6.43	6.45	5.99

1/ July - June for all estimated States.
2/ Second year.
3/ Not published to avoid disclosure of individual firms.

Prices Received: All Sunflower, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Sep	Oct	Nov	Dec	Jan 2/	Feb
	Dollars per Cwt					
			1997-98			
KS 3/:						
MN	13.20	11.70	11.40	11.20	11.20	12.00
ND	11.40	10.90	11.20	11.10	11.50	12.10
SD	10.10	9.80	10.30	10.40	10.50	11.00
US	11.20	10.60	11.10	11.10	11.10	11.80
			1996-97			
KS 3/:						
MN	9.68	12.90	13.20	14.10	14.00	13.60
ND	13.30	12.30	12.10	12.00	12.20	12.60
SD	11.60	10.60	10.50	10.30	10.20	10.80
US	12.10	11.70	11.80	11.50	12.00	12.10

See footnotes at end of table. -- continued

Prices Received: All Sunflower, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Mar	Apr	May	Jun	Jul	Aug

	Dollars per Cwt				
			1997-98		
KS 3/:					
MN	12.30	13.10	13.40	13.30	14.10
12.80					
ND	12.10	12.70	13.60	14.60	16.50
14.70					
SD	11.70	12.70	13.90	14.10	14.00
15.00					
US	12.10	12.70	13.80	14.40	15.80
14.40					
			1996-97		
KS 3/:					
MN	12.70	13.60	12.70	13.00	12.10
10.70					
ND	12.60	12.90	12.10	12.00	11.50
10.90					
SD	11.10	11.00	11.30	10.90	10.10
10.10					
US	12.20	12.40	12.10	11.90	10.80
10.70					

1/ September - August for all estimated States.
2/ Second year.
3/ Not published to avoid disclosure of individual firms.

Prices Received: Oil Sunflower, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Sep	Oct	Nov	Dec	Jan 2/	Feb
	Dollars per Cwt					
			1997-98			
KS 3/:						
MN	9.78	9.94	10.30	10.50	10.70	10.90
ND	10.40	10.10	10.70	10.40	10.80	11.30

SD	9.75	9.74	10.20	10.40	10.50	11.00
US	10.10	10.00	10.60	10.40	10.70	11.20
			1996-97			
KS 3/:						
MN	9.47	10.70	12.50	10.90	10.30	11.30
ND	12.40	10.80	10.70	10.70	10.90	10.90
SD	11.50	10.40	10.50	10.30	10.20	10.80
US	11.20	10.70	10.80	10.50	10.80	11.00

See footnotes at end of table. -- continued

Prices Received: Oil Sunflower, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Mar	Apr	May	Jun	Jul	Aug
			Dollars per Cwt			
			1997-98			
KS 3/:						
MN	11.60	12.40	13.30	13.30	13.80	12.80
ND	11.70	12.50	13.40	13.80	14.00	13.80
SD	11.70	12.70	13.90	14.10	14.00	15.00
US	11.70	12.50	13.60	13.90	14.00	13.90
			1996-97			
KS 3/:						
MN	10.90	11.00	11.30	11.20	10.30	9.26
ND	11.20	11.30	11.50	11.20	10.50	9.94

SD	11.10	11.10	11.40	11.00	10.70	10.10
US	11.10	11.30	11.50	11.10	10.50	9.97

1/ September - August for all estimated States.
2/ Second year.
3/ Not published to avoid disclosure of individual firms.

Prices Received: Non-Oil Sunflower, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Sep	Oct	Nov	Dec	Jan 2/	Feb
			Dollars per Cwt			
			1997-98			
KS 3/:						
MN	14.00	13.80	13.70	13.50	13.40	13.90
ND	14.00	14.10	13.80	13.80	14.20	14.10
SD 3/:						
US	13.80	14.00	14.00	13.80	14.10	14.00
			1996-97			
KS 3/:						
MN	15.20	15.00	15.60	15.40	14.80	15.00
ND	15.30	15.80	15.40	15.50	15.80	15.30
SD	11.60	11.00	10.70	10.10	10.50	10.80
US	14.20	13.80	15.10	14.60	14.70	14.70

See footnotes at end of table. -- continued

Prices Received: Non-Oil Sunflower, by State and Month,

for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Mar	Apr	May	Jun	Jul	Aug
	Dollars per Cwt					
			1997-98			
KS 3/						
MN	14.10	14.90	13.90	13.20	16.00	14.80
ND	14.20	14.40	14.70	16.60	19.00	16.30
SD 3/						
US	14.20	14.50	15.10	16.50	18.50	16.20
			1996-97			
KS 3/						
MN	15.20	15.10	14.50	15.20	14.30	14.20
ND	15.30	15.60	15.20	14.70	14.30	14.10
SD		10.80	10.90		10.00	9.25
US	15.20	14.40	13.90	14.60	10.90	13.80

1/ September - August for all estimated States.
2/ Second year.
3/ Not published to avoid disclosure of individual firms.

Prices Received: All Hay, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	Apr	May	Jun	Jul	Aug	Sep	Oct
	Dollars per Ton						
			1997-98				

AZ	140.00	127.00	106.00	103.00	96.00	88.00
98.00						
CA	128.00	128.00	122.00	115.00	111.00	113.00
110.00						
CO	115.00	125.00	120.00	100.00	100.00	101.00
100.00						
ID	113.00	107.00	111.00	97.00	106.00	107.00
114.00						
IL	125.00	120.00	111.00	95.00	96.00	100.00
101.00						
IA	112.00	117.00	116.00	117.00	108.00	110.00
109.00						
KS	85.00	92.00	89.00	85.00	77.00	83.00
87.00						
KY	80.00	86.00	71.00	70.00	78.00	77.00
75.00						
MI	115.00	118.00	108.00	83.00	98.00	103.00
103.00						
MN	95.00	108.00	96.00	94.00	91.00	93.00
91.00						
MO	70.00	72.00	71.00	68.00	67.00	72.00
72.00						
MT	113.00	99.00	84.00	78.00	82.00	84.00
84.00						
NE	70.00	71.00	76.00	76.00	77.00	77.00
79.00						
NV	111.00	116.00	102.00	103.00	106.00	101.00
99.00						
NM	140.00	131.00	126.00	127.00	118.00	116.00
121.00						
NY	90.00	87.00	84.00	83.00	79.00	86.00
101.00						
ND	65.00	64.00	64.00	65.00	66.00	61.00
60.00						
OH	163.00	169.00	156.00	135.00	143.00	137.00
146.00						
OK	84.00	84.00	79.00	72.00	74.00	85.00
88.00						
OR	121.00	115.00	103.00	114.00	120.00	118.00
123.00						
PA	132.00	129.00	129.00	118.00	128.00	132.00
137.00						
SD	85.00	93.00	96.00	87.00	74.00	83.00
86.00						
TX	78.00	91.00	87.00	76.00	73.00	69.00
67.00						
UT	83.00	88.00	85.00	88.00	83.00	84.00
85.00						
WA	118.00	118.00	110.00	116.00	115.00	118.00
112.00						
WI	105.00	103.00	96.00	90.00	81.00	80.00
85.00						
WY	94.00	94.00	85.00	81.00	83.00	87.00
87.00						

:						
US :	117.00	117.00	105.00	98.80	99.00	100.00
100.00						
:						
:				1996-97		
:						
AZ :	100.00	92.00	85.00	80.00	80.00	83.00
97.00						
AR 3/:	74.00	63.00	61.00			
CA :	105.00	102.00	103.00	98.00	100.00	104.00
110.00						
CO :	84.00	88.00	86.00	85.00	93.00	95.00
98.00						
ID :	82.00	78.00	86.00	90.00	91.00	91.00
92.00						
IL :	86.00	83.00	94.00	89.00	94.00	97.00
99.00						
IN 3/:	99.00	103.00	99.00			
IA :	87.00	90.00	102.00	94.00	93.00	95.00
98.00						
KS :	78.00	78.00	78.00	71.00	69.00	71.00
86.00						
KY :	77.00	92.00	78.00	85.00	99.00	91.00
77.00						
MI :	69.00	79.00	80.00	74.00	77.00	87.00
91.00						
MN :	79.00	75.00	73.00	66.00	60.00	68.00
72.00						
MO :	67.00	86.00	70.00	71.00	64.00	63.00
69.00						
MT :	67.00	63.00	64.00	65.00	67.00	73.00
72.00						
NE :	59.00	61.00	62.00	64.00	64.00	63.00
62.00						
NV :	94.00	94.00	96.00	98.00	97.00	97.00
92.00						
NM :	126.00	125.00	129.00	123.00	130.00	123.00
124.00						
NY :	92.00	87.00	85.00	76.00	80.00	72.00
97.00						
ND :	46.00	43.00	44.00	46.00	46.00	47.00
48.00						
OH :	90.00	90.00	101.00	109.00	117.00	125.00
121.00						
OK :	84.00	89.00	95.00	96.00	90.00	92.00
88.00						
OR :	103.00	102.00	91.00	98.00	99.00	100.00
100.00						
PA :	105.00	110.00	114.00	101.00	110.00	112.00
117.00						
SD :	60.00	67.00	68.00	65.00	68.00	72.00
75.00						
TX :	77.00	120.00	116.00	110.00	110.00	114.00
89.00						

UT	57.00	59.00	57.00	72.00	72.00	68.00
67.00						
WA	105.00	115.00	115.00	118.00	113.00	112.00
113.00						
WI	71.00	53.00	68.00	58.00	59.00	65.00
64.00						
WY	63.00	62.00	64.00	68.00	70.00	72.00
73.00						
US	88.50	94.40	94.00	92.20	92.60	92.00
91.60						

See footnotes at end of table. -- continued

Prices Received: All Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Nov	Dec	Jan 2/	Feb	Mar	Apr	May
	Dollars per Ton						
	1997-98						
AZ	97.00	105.00	110.00	107.00	105.00	115.00	107.00
CA	123.00	118.00	118.00	120.00	113.00	129.00	116.00
CO	101.00	101.00	105.00	100.00	102.00	97.00	91.00
ID	111.00	105.00	105.00	102.00	99.00	89.00	80.00
IL	104.00	107.00	105.00	101.00	100.00	101.00	95.00
IA	110.00	112.00	110.00	105.00	104.00	101.00	99.00
KS	83.00	85.00	87.00	81.00	76.00	74.00	71.00
KY	81.00	75.00	76.00	83.00	84.00	88.00	93.00
MI	109.00	104.00	108.00	102.00	98.00	99.00	101.00
MN	89.00	90.00	89.00	89.00	82.00	79.00	75.00
MO	72.00	72.00	72.00	72.00	72.00	72.00	73.00
MT	80.00	81.00	77.00	73.00	70.00	70.00	70.00

NE :	74.00	80.00	78.00	75.00	73.00	71.00
67.00						
NV :	104.00	109.00	106.00	107.00	109.00	104.00
105.00						
NM :	123.00	123.00	121.00	128.00	129.00	127.00
118.00						
NY :	102.00	95.00	101.00	108.00	102.00	109.00
91.00						
ND :	60.00	59.00	59.00	57.00	54.00	51.00
54.00						
OH :	143.00	140.00	130.00	113.00	121.00	114.00
110.00						
OK :	71.00	79.00	68.00	86.00	81.00	78.00
83.00						
OR :	121.00	121.00	116.00	118.00	123.00	114.00
112.00						
PA :	140.00	143.00	148.00	151.00	143.00	148.00
131.00						
SD :	80.00	74.00	72.00	70.00	60.00	58.00
56.00						
TX :	69.00	67.00	66.00	66.00	66.00	65.00
96.00						
UT :	86.00	85.00	83.00	79.00	80.00	78.00
77.00						
WA :	120.00	117.00	122.00	115.00	112.00	112.00
110.00						
WI :	85.00	97.00	97.00	100.00	104.00	104.00
94.00						
WY :	87.00	87.00	87.00	86.00	84.00	76.00
77.00						
:						
US :	100.00	95.20	94.70	96.10	95.30	98.00
102.00						
:						
:				1996-97		
:						
AZ :	107.00	99.00	116.00	124.00	124.00	140.00
127.00						
AR 3/:						
CA :	110.00	117.00	124.00	132.00	126.00	128.00
128.00						
CO :	98.00	98.00	106.00	109.00	111.00	115.00
125.00						
ID :	100.00	94.00	92.00	108.00	116.00	113.00
107.00						
IL :	105.00	107.00	118.00	115.00	121.00	125.00
120.00						
IN 3/:						
IA :	102.00	109.00	118.00	116.00	115.00	112.00
117.00						
KS :	87.00	86.00	89.00	81.00	82.00	85.00
92.00						
KY :	82.00	76.00	76.00	83.00	81.00	80.00
86.00						

MI	105.00	116.00	132.00	118.00	123.00	115.00
118.00						
MN	86.00	84.00	90.00	87.00	93.00	95.00
108.00						
MO	68.00	70.00	74.00	72.00	69.00	70.00
72.00						
MT	75.00	84.00	105.00	115.00	113.00	113.00
99.00						
NE	63.00	66.00	69.00	71.00	71.00	70.00
71.00						
NV	95.00	101.00	101.00	115.00	110.00	111.00
116.00						
NM	128.00	133.00	140.00	146.00	145.00	140.00
131.00						
NY	92.00	91.00	93.00	88.00	94.00	90.00
87.00						
ND	46.00	48.00	54.00	64.00	60.00	65.00
64.00						
OH	144.00	159.00	159.00	159.00	150.00	163.00
169.00						
OK	93.00	96.00	105.00	98.00	94.00	84.00
84.00						
OR	103.00	103.00	106.00	112.00	115.00	121.00
115.00						
PA	121.00	132.00	135.00	141.00	131.00	132.00
129.00						
SD	69.00	75.00	80.00	88.00	90.00	85.00
93.00						
TX	82.00	83.00	85.00	87.00	80.00	78.00
91.00						
UT	72.00	77.00	82.00	82.00	83.00	83.00
88.00						
WA	113.00	118.00	120.00	119.00	117.00	118.00
118.00						
WI	67.00	92.00	127.00	98.00	110.00	105.00
103.00						
WY	73.00	77.00	82.00	89.00	94.00	94.00
94.00						
US	92.00	90.80	97.90	102.00	102.00	117.00
117.00						

1/ April - March for AZ; May - April for AR, CA, GA, KS, KY, MO, NV, NM, OK, TX and UT; June - May for all other estimated States; April - May for US.
2/ Second year.
3/ Estimates discontinued.

Prices Received: Alfalfa Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Apr	May	Jun	Jul	Aug	Sep	Oct
			Dollars per Ton				
				1997-98			
AZ	141.00	127.00	106.00	104.00	96.00	90.00	99.00
CA	132.00	131.00	125.00	117.00	113.00	113.00	111.00
CO	115.00	125.00	120.00	100.00	100.00	100.00	100.00
ID	115.00	108.00	112.00	100.00	109.00	109.00	116.00
IL	130.00	125.00	116.00	100.00	101.00	105.00	106.00
IA	117.00	119.00	117.00	120.00	110.00	112.00	113.00
KS	91.00	95.00	90.00	89.00	85.00	90.00	89.00
KY	98.00	95.00	91.00	91.00	95.00	100.00	110.00
MI	120.00	125.00	110.00	85.00	100.00	105.00	105.00
MN	109.00	115.00	110.00	104.00	103.00	102.00	97.00
MO	104.00	105.00	104.00	102.00	100.00	105.00	106.00
MT	114.00	101.00	84.00	79.00	82.00	84.00	85.00
NE	74.00	74.00	78.00	78.00	79.00	79.00	81.00
NV	116.00	119.00	105.00	105.00	108.00	102.00	100.00
NM	141.00	134.00	129.00	130.00	121.00	119.00	124.00
NY	92.00	90.00	113.00	95.00	97.00	102.00	110.00
ND	72.00	69.00	66.00	70.00	72.00	69.00	65.00
OH	200.00	210.00	190.00	165.00	170.00	165.00	180.00
OK	100.00	100.00	102.00	88.00	85.00	102.00	102.00
OR	123.00	120.00	115.00	120.00	125.00	125.00	130.00
PA	139.00	144.00	148.00	134.00	143.00	157.00	156.00
SD	98.00	97.00	97.00	90.00	75.00	85.00	90.00

TX	145.00	150.00	135.00	130.00	130.00	128.00
131.00						
UT	83.00	88.00	85.00	89.00	84.00	84.00
85.00						
WA	110.00	112.00	110.00	114.00	113.00	116.00
108.00						
WI	110.00	109.00	104.00	95.00	85.00	85.00
90.00						
WY	95.00	95.00	85.00	81.00	84.00	87.00
87.00						
US	123.00	125.30	114.00	107.00	105.00	106.00
106.00						
				1996-97		
AZ	101.00	92.00	85.00	82.00	81.00	84.00
98.00						
AR 3/	125.00	130.00	134.00			
CA	108.00	104.00	104.00	100.00	101.00	106.00
111.00						
CO	85.00	89.00	87.00	85.00	94.00	96.00
99.00						
ID	83.00	78.00	86.00	92.00	93.00	92.00
93.00						
IL	90.00	87.00	96.00	94.00	100.00	100.00
105.00						
IN 3/	107.00	110.00	110.00			
IA	91.00	92.00	103.00	96.00	95.00	97.00
101.00						
KS	81.00	80.00	80.00	78.00	78.00	79.00
89.00						
KY	107.00	104.00	98.00	107.00	118.00	117.00
114.00						
MI	70.00	80.00	80.00	75.00	80.00	90.00
100.00						
MN	84.00	84.00	85.00	83.00	83.00	85.00
82.00						
MO	100.00	101.00	102.00	98.00	98.00	97.00
100.00						
MT	68.00	65.00	64.00	66.00	68.00	74.00
73.00						
NE	62.00	63.00	63.00	67.00	68.00	67.00
64.00						
NV	95.00	93.00	103.00	100.00	97.00	99.00
96.00						
NM	129.00	126.00	129.00	123.00	130.00	123.00
124.00						
NY	99.00	92.00	95.00	89.00	96.00	86.00
110.00						
ND	49.00	49.00	45.00	48.00	49.00	53.00
51.00						
OH	115.00	125.00	130.00	130.00	135.00	145.00
150.00						

OK	100.00	107.00	114.00	116.00	110.00	110.00
107.00						
OR	105.00	106.00	104.00	105.00	105.00	106.00
105.00						
PA	116.00	126.00	125.00	113.00	117.00	121.00
128.00						
SD	65.00	69.00	69.00	68.00	71.00	79.00
81.00						
TX	152.00	150.00	145.00	137.00	139.00	140.00
123.00						
UT	57.00	59.00	57.00	73.00	74.00	68.00
67.00						
WA	98.00	108.00	112.00	111.00	106.00	108.00
109.00						
WI	73.00	54.00	69.00	60.00	60.00	66.00
65.00						
WY	65.00	63.00	64.00	68.00	72.00	74.00
74.00						
US	93.20	97.90	98.50	96.50	97.90	96.60
95.80						

See footnotes at end of table. -- continued

Prices Received: Alfalfa Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Nov	Dec	Jan 2/	Feb	Mar	Apr	May
	Dollars per Ton						
			1997-98				
AZ	100.00	106.00	110.00	108.00	105.00	115.00	109.00
CA	125.00	119.00	120.00	121.00	115.00	130.00	116.00
CO	100.00	100.00	105.00	100.00	102.00	97.00	90.00
ID	114.00	106.00	107.00	103.00	100.00	90.00	80.00
IL	109.00	112.00	110.00	106.00	105.00	106.00	100.00
IA	114.00	114.00	111.00	107.00	107.00	105.00	10100
KS	85.00	88.00	90.00	89.00	87.00	78.00	73.00

KY	108.00	104.00	103.00	107.00	107.00	110.00
110.00						
MI	110.00	105.00	110.00	105.00	100.00	100.00
105.00						
MN	100.00	95.00	100.00	105.00	94.00	89.00
83.00						
MO	105.00	106.00	106.00	107.00	107.00	105.00
107.00						
MT	81.00	82.00	78.00	74.00	71.00	71.00
71.00						
NE	82.00	83.00	81.00	80.00	77.00	74.00
68.00						
NV	106.00	111.00	107.00	109.00	111.00	105.00
106.00						
NM	126.00	126.00	124.00	131.00	132.00	131.00
120.00						
NY	112.00	104.00	111.00	113.00	128.00	142.00
92.00						
ND	64.00	65.00	62.00	60.00	61.00	57.00
57.00						
OH	175.00	170.00	160.00	135.00	145.00	135.00
130.00						
OK	85.00	93.00	84.00	100.00	96.00	87.00
94.00						
OR	125.00	125.00	120.00	120.00	125.00	115.00
115.00						
PA	157.00	166.00	168.00	171.00	167.00	166.00
156.00						
SD	85.00	80.00	75.00	75.00	65.00	65.00
59.00						
TX	139.00	139.00	150.00	150.00	160.00	153.00
149.00						
UT	86.00	85.00	84.00	80.00	81.00	78.00
77.00						
WA	114.00	110.00	114.00	109.00	100.00	108.00
101.00						
WI	90.00	105.00	105.00	106.00	110.00	109.00
100.00						
WY	88.00	87.00	87.00	86.00	85.00	78.00
78.00						
US	107.00	102.00	102.00	105.00	102.00	105.00
107.00						
				1996-97		
AZ	109.00	100.00	119.00	126.00	125.00	141.00
127.00						
AR 3/:						
CA	112.00	118.00	126.00	133.00	127.00	132.00
131.00						
CO	99.00	99.00	107.00	111.00	111.00	115.00
125.00						

ID	101.00	94.00	93.00	109.00	117.00	115.00
108.00						
IL	110.00	112.00	125.00	125.00	130.00	130.00
125.00						
IN 3/:						
IA	104.00	111.00	119.00	119.00	118.00	117.00
119.00						
KS	90.00	90.00	93.00	93.00	89.00	91.00
95.00						
KY	112.00	106.00	104.00	108.00	104.00	98.00
95.00						
MI	110.00	120.00	135.00	120.00	125.00	120.00
125.00						
MN	93.00	91.00	98.00	101.00	103.00	109.00
115.00						
MO	101.00	102.00	105.00	103.00	105.00	104.00
105.00						
MT	76.00	85.00	106.00	117.00	114.00	114.00
101.00						
NE	66.00	69.00	71.00	73.00	75.00	74.00
74.00						
NV	97.00	104.00	104.00	117.00	114.00	116.00
119.00						
NM	129.00	134.00	141.00	147.00	146.00	141.00
134.00						
NY	110.00	103.00	108.00	99.00	106.00	92.00
90.00						
ND	49.00	51.00	56.00	67.00	68.00	72.00
69.00						
OH	180.00	190.00	200.00	190.00	185.00	200.00
210.00						
OK	115.00	120.00	125.00	124.00	121.00	100.00
100.00						
OR	107.00	107.00	110.00	115.00	118.00	123.00
120.00						
PA	129.00	140.00	142.00	152.00	140.00	139.00
144.00						
SD	76.00	84.00	88.00	96.00	99.00	98.00
97.00						
TX	122.00	141.00	153.00	154.00	150.00	145.00
150.00						
UT	73.00	78.00	83.00	83.00	84.00	83.00
88.00						
WA	107.00	113.00	112.00	116.00	110.00	110.00
112.00						
WI	68.00	95.00	132.00	101.00	115.00	110.00
109.00						
WY	74.00	78.00	83.00	90.00	95.00	95.00
95.00						
US	97.00	97.00	104.00	113.00	116.00	123.00
125.30						

1/ April - March for AZ; May - April for AR, CA, GA, KS, KY, MO, NV, NM, OK,
TX and UT; June - May for all other estimated States; April - May for US.
2/ Second year.
3/ Estimates discontinued.

Prices Received: Other Hay, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	Apr	May	Jun	Jul	Aug	Sep	Oct
			Dollars per Ton				
				1997-98			
AZ	74.00	132.00	98.00	95.00	94.00	80.00	67.00
CA	83.00	83.00	85.00	82.00			
MO	100.00	101.00	102.00	98.00	98.00	97.00	100.00
MT	68.00	65.00	64.00	66.00	68.00	74.00	73.00
NE	62.00	63.00	63.00	67.00	68.00	67.00	64.00
NV	95.00	93.00	103.00	100.00	97.00	99.00	96.00
NM	129.00	126.00	129.00	123.00	130.00	123.00	124.00
NY	99.00	92.00	95.00	89.00	96.00	86.00	110.00
ND	49.00	49.00	45.00	48.00	49.00	53.00	51.00
OH	115.00	125.00	130.00	130.00	135.00	145.00	150.00
OK	100.00	107.00	114.00	116.00	110.00	110.00	107.00
OR	105.00	106.00	104.00	105.00	105.00	106.00	105.00
PA	116.00	126.00	125.00	113.00	117.00	121.00	128.00
SD	65.00	69.00	69.00	68.00	71.00	79.00	81.00
TX	152.00	150.00	145.00	137.00	139.00	140.00	123.00
UT	57.00	59.00	57.00	73.00	74.00	68.00	67.00
WA	98.00	108.00	112.00	111.00	106.00	108.00	109.00

WI	73.00	54.00	69.00	60.00	60.00	66.00
65.00						
WY	65.00	63.00	64.00	68.00	72.00	74.00
74.00						
US	93.20	97.90	98.50	96.50	97.90	96.60
95.80						

See footnotes at end of table. -- continued

Prices Received: Alfalfa Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Nov	Dec	Jan 2/	Feb	Mar	Apr
May						
	Dollars per Ton					
	1997-98					
AZ	100.00	106.00	110.00	108.00	105.00	115.00
109.00						
CA	125.00	119.00	120.00	121.00	115.00	130.00
116.00						
CO	100.00	100.00	105.00	100.00	102.00	97.00
90.00						
ID	114.00	106.00	107.00	103.00	100.00	90.00
80.00						
IL	109.00	112.00	110.00	106.00	105.00	106.00
100.00						
IA	114.00	114.00	111.00	107.00	107.00	105.00
10100						
KS	85.00	88.00	90.00	89.00	87.00	78.00
73.00						
KY	108.00	104.00	103.00	107.00	107.00	110.00
110.00						
MI	110.00	105.00	110.00	105.00	100.00	100.00
105.00						
MN	100.00	95.00	100.00	105.00	94.00	89.00
83.00						
MO	105.00	106.00	106.00	107.00	107.00	105.00
107.00						
MT	81.00	82.00	78.00	74.00	71.00	71.00
71.00						
NE	82.00	83.00	81.00	80.00	77.00	74.00
68.00						
NV	106.00	111.00	107.00	109.00	111.00	105.00
106.00						

NM	126.00	126.00	124.00	131.00	132.00	131.00
120.00						
NY	112.00	104.00	111.00	113.00	128.00	142.00
92.00						
ND	64.00	65.00	62.00	60.00	61.00	57.00
57.00						
OH	175.00	170.00	160.00	135.00	145.00	135.00
130.00						
OK	85.00	93.00	84.00	100.00	96.00	87.00
94.00						
OR	125.00	125.00	120.00	120.00	125.00	115.00
115.00						
PA	157.00	166.00	168.00	171.00	167.00	166.00
156.00						
SD	85.00	80.00	75.00	75.00	65.00	65.00
59.00						
TX	139.00	139.00	150.00	150.00	160.00	153.00
149.00						
UT	86.00	85.00	84.00	80.00	81.00	78.00
77.00						
WA	114.00	110.00	114.00	109.00	100.00	108.00
101.00						
WI	90.00	105.00	105.00	106.00	110.00	109.00
100.00						
WY	88.00	87.00	87.00	86.00	85.00	78.00
78.00						
US	107.00	102.00	102.00	105.00	102.00	105.00
107.00						
				1996-97		
AZ	109.00	100.00	119.00	126.00	125.00	141.00
127.00						
AR 3/:						
CA	112.00	118.00	126.00	133.00	127.00	132.00
131.00						
CO	99.00	99.00	107.00	111.00	111.00	115.00
125.00						
ID	101.00	94.00	93.00	109.00	117.00	115.00
108.00						
IL	110.00	112.00	125.00	125.00	130.00	130.00
125.00						
IN 3/:						
IA	104.00	111.00	119.00	119.00	118.00	117.00
119.00						
KS	90.00	90.00	93.00	93.00	89.00	91.00
95.00						
KY	112.00	106.00	104.00	108.00	104.00	98.00
95.00						
MI	110.00	120.00	135.00	120.00	125.00	120.00
125.00						
MN	93.00	91.00	98.00	101.00	103.00	109.00
115.00						

MO	101.00	102.00	105.00	103.00	105.00	104.00
105.00						
MT	76.00	85.00	106.00	117.00	114.00	114.00
101.00						
NE	66.00	69.00	71.00	73.00	75.00	74.00
74.00						
NV	97.00	104.00	104.00	117.00	114.00	116.00
119.00						
NM	129.00	134.00	141.00	147.00	146.00	141.00
134.00						
NY	110.00	103.00	108.00	99.00	106.00	92.00
90.00						
ND	49.00	51.00	56.00	67.00	68.00	72.00
69.00						
OH	180.00	190.00	200.00	190.00	185.00	200.00
210.00						
OK	115.00	120.00	125.00	124.00	121.00	100.00
100.00						
OR	107.00	107.00	110.00	115.00	118.00	123.00
120.00						
PA	129.00	140.00	142.00	152.00	140.00	139.00
144.00						
SD	76.00	84.00	88.00	96.00	99.00	98.00
97.00						
TX	122.00	141.00	153.00	154.00	150.00	145.00
150.00						
UT	73.00	78.00	83.00	83.00	84.00	83.00
88.00						
WA	107.00	113.00	112.00	116.00	110.00	110.00
112.00						
WI	68.00	95.00	132.00	101.00	115.00	110.00
109.00						
WY	74.00	78.00	83.00	90.00	95.00	95.00
95.00						
US	97.00	97.00	104.00	113.00	116.00	123.00
125.30						

1/ April - March for AZ; May - April for AR, CA, GA, KS, KY, MO, NV, NM, OK, TX and UT; June - May for all other estimated States; April - May for US.
2/ Second year.
3/ Estimates discontinued.

Prices Received: Other Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	Apr	May	Jun	Jul	Aug	Sep	Oct

	Dollars per Ton					
	1997-98					
AZ	74.00	132.00	98.00	95.00	94.00	80.00
67.00						
CA	92.00	91.00	93.00	100.00	98.00	108.00
95.00						
CO	110.00	115.00	110.00	105.00	105.00	105.00
105.00						
ID	76.00	74.00	77.00	73.00	80.00	81.00
80.00						
IL	96.00	92.00	90.00	76.00	78.00	82.00
80.00						
IA	74.00	77.00	73.00	80.00	77.00	77.00
76.00						
KS	71.00	68.00	74.00	76.00	66.00	70.00
74.00						
KY	66.00	63.00	59.00	59.00	62.00	65.00
72.00						
MI	100.00	110.00	95.00	70.00	85.00	90.00
90.00						
MN	70.00	67.00	63.00	69.00	73.00	73.00
68.00						
MO	64.00	65.00	64.00	61.00	60.00	65.00
65.00						
MT	95.00	89.00	71.00	71.00	73.00	72.00
71.00						
NE	50.00	53.00	53.00	54.00	55.00	56.00
61.00						
NV	90.00	86.00	78.00	85.00	85.00	90.00
87.00						
NM	103.00	103.00	100.00	103.00	90.00	88.00
95.00						
NY	89.00	85.00	71.00	75.00	60.00	79.00
88.00						
ND	47.00	44.00	43.00	48.00	48.00	46.00
44.00						
OH	100.00	110.00	95.00	80.00	95.00	80.00
100.00						
OK	59.00	59.00	45.00	48.00	57.00	59.00
68.00						
OR	85.00	80.00	90.00	92.00	95.00	90.00
90.00						
PA	107.00	111.00	115.00	103.00	113.00	120.00
120.00						
SD	64.00	67.00	67.00	57.00	55.00	60.00
65.00						
TX	72.00	71.00	70.00	60.00	59.00	56.00
58.00						
UT	55.00	55.00	55.00	60.00	60.00	60.00
70.00						

WA	142.00	137.00	126.00	128.00	127.00	136.00
139.00						
WI	70.00	65.00	62.00	70.00	65.00	60.00
65.00						
WY	85.00	85.00	78.00	74.00	77.00	80.00
80.00						
US	82.30	83.40	76.00	73.20	75.40	74.80
76.20						
				1996-97		
AZ	63.00	96.00	93.00	53.00	47.00	62.00
69.00						
AR 3/	68.00	56.00	53.00			
CA	71.00	77.00	83.00	78.00	82.00	71.00
81.00						
CO	74.00	75.00	76.00	75.00	81.00	87.00
85.00						
ID	60.00	63.00	67.00	71.00	66.00	74.00
76.00						
IL	63.00	63.00	73.00	70.00	73.00	78.00
80.00						
IN 3/	84.00	91.00	79.00			
IA	65.00	72.00	76.00	67.00	66.00	66.00
74.00						
KS	59.00	58.00	58.00	57.00	57.00	58.00
69.00						
KY	66.00	64.00	66.00	73.00	80.00	77.00
74.00						
MI	65.00	75.00	75.00	70.00	65.00	70.00
80.00						
MN	53.00	53.00	58.00	54.00	51.00	51.00
62.00						
MO	60.00	62.00	62.00	62.00	60.00	61.00
60.00						
MT	57.00	56.00	55.00	55.00	58.00	59.00
58.00						
NE	44.00	43.00	43.00	48.00	49.00	51.00
47.00						
NV	85.00	98.00	55.00	75.00	92.00	79.00
64.00						
NM	94.00	97.00	99.00	97.00	102.00	94.00
91.00						
NY	80.00	70.00	69.00	68.00	69.00	55.00
75.00						
ND	32.00	36.00	32.00	35.00	36.00	34.00
35.00						
OH	60.00	60.00	60.00	75.00	80.00	90.00
90.00						
OK	60.00	61.00	67.00	57.00	60.00	66.00
60.00						
OR	76.00	76.00	76.00	74.00	74.00	74.00
74.00						

PA	93.00	101.00	99.00	91.00	95.00	99.00
101.00						
SD	48.00	55.00	51.00	58.00	47.00	47.00
48.00						
TX	71.00	75.00	95.00	95.00	91.00	94.00
76.00						
UT	40.00	40.00	40.00	45.00	45.00	43.00
45.00						
WA	124.00	132.00	140.00	143.00	144.00	146.00
140.00						
WI	60.00	45.00	60.00	40.00	50.00	55.00
56.00						
WY	60.00	58.00	60.00	63.00	64.00	67.00
67.00						
US	71.10	76.80	76.40	78.20	74.10	73.60
73.10						

See footnotes at end of table. -- continued

Prices Received: Other Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Nov	Dec	Jan 2/	Feb	Mar	Apr	May
	Dollars per Ton						
	1997-98						
AZ	68.00	80.00	102.00	91.00	86.00		61.00
CA	98.00	108.00	103.00	107.00	87.00	104.00	106.00
CO	110.00	110.00	110.00	105.00	106.00	105.00	98.00
ID	70.00	75.00	80.00	90.00	80.00	65.00	55.00
IL	84.00	87.00	86.00	81.00	80.00	80.00	76.00
IA	75.00	74.00	75.00	71.00	69.00	73.00	67.00
KS	72.00	74.00	72.00	76.00	66.00	64.00	65.00
KY	71.00	68.00	67.00	70.00	70.00	72.00	73.00
MI	100.00	95.00	100.00	90.00	90.00	95.00	85.00

MN	63.00	68.00	64.00	52.00	55.00	41.00
57.00						
MO	65.00	65.00	65.00	65.00	65.00	65.00
66.00						
MT	71.00	70.00	66.00	66.00	63.00	60.00
61.00						
NE	62.00	62.00	63.00	56.00	57.00	56.00
54.00						
NV	85.00	95.00	95.00	90.00	95.00	91.00
93.00						
NM	95.00	97.00	92.00	96.00	102.00	96.00
98.00						
NY	88.00	85.00	92.00	106.00	76.00	76.00
89.00						
ND	42.00	42.00	41.00	40.00	41.00	37.00
38.00						
OH	95.00	90.00	90.00	80.00	80.00	70.00
75.00						
OK	51.00	59.00	45.00	66.00	58.00	65.00
66.00						
OR	95.00	95.00	90.00	95.00	94.00	94.00
95.00						
PA	125.00	129.00	131.00	133.00	131.00	129.00
117.00						
SD	65.00	60.00	60.00	55.00	45.00	45.00
41.00						
TX	63.00	62.00	62.00	60.00	60.00	57.00
60.00						
UT	72.00	70.00	70.00	68.00	67.00	60.00
60.00						
WA	151.00	146.00	138.00	137.00	144.00	123.00
137.00						
WI	65.00	65.00	65.00	70.00	80.00	81.00
70.00						
WY	80.00	80.00	80.00	80.00	79.00	71.00
71.00						
US	75.80	76.10	76.40	76.80	76.30	72.20
78.60						
				1996-97		
AZ	87.00	75.00	60.00	60.00	50.00	74.00
132.00						
AR 3/:						
CA	92.00	91.00	93.00	100.00	98.00	108.00
95.00						
CO	110.00	115.00	110.00	105.00	105.00	105.00
105.00						
ID	76.00	74.00	77.00	73.00	80.00	81.00
80.00						
IL	96.00	92.00	90.00	76.00	78.00	82.00
80.00						

IA	: 74.00	77.00	73.00	80.00	77.00	77.00	76.00
KS	: 71.00	68.00	74.00	76.00	66.00	70.00	74.00
KY	: 66.00	63.00	59.00	59.00	62.00	65.00	72.00
MI	: 100.00	110.00	95.00	70.00	85.00	90.00	90.00
MN	: 70.00	67.00	63.00	69.00	73.00	73.00	68.00
MO	: 64.00	65.00	64.00	61.00	60.00	65.00	65.00
MT	: 95.00	89.00	71.00	71.00	73.00	72.00	71.00
NE	: 50.00	53.00	53.00	54.00	55.00	56.00	61.00
NV	: 90.00	86.00	78.00	85.00	85.00	90.00	87.00
NM	: 103.00	103.00	100.00	103.00	90.00	88.00	95.00
NY	: 89.00	85.00	71.00	75.00	60.00	79.00	88.00
ND	: 47.00	44.00	43.00	48.00	48.00	46.00	44.00
OH	: 100.00	110.00	95.00	80.00	95.00	80.00	100.00
OK	: 59.00	59.00	45.00	48.00	57.00	59.00	68.00
OR	: 85.00	80.00	90.00	92.00	95.00	90.00	90.00
PA	: 107.00	111.00	115.00	103.00	113.00	120.00	120.00
SD	: 64.00	67.00	67.00	57.00	55.00	60.00	65.00
TX	: 72.00	71.00	70.00	60.00	59.00	56.00	58.00
UT	: 55.00	55.00	55.00	60.00	60.00	60.00	70.00
WA	: 142.00	137.00	126.00	128.00	127.00	136.00	139.00
WI	: 70.00	65.00	62.00	70.00	65.00	60.00	65.00
WY	: 85.00	85.00	78.00	74.00	77.00	80.00	80.00
	:						
US	: 82.30	83.40	76.00	73.20	75.40	74.80	76.20
	:						
	:			1996-97			
	:						
AZ	: 63.00	96.00	93.00	53.00	47.00	62.00	69.00
AR 3/:	68.00	56.00	53.00				

CA	:	71.00	77.00	83.00	78.00	82.00	71.00
81.00							
CO	:	74.00	75.00	76.00	75.00	81.00	87.00
85.00							
ID	:	60.00	63.00	67.00	71.00	66.00	74.00
76.00							
IL	:	63.00	63.00	73.00	70.00	73.00	78.00
80.00							
IN 3/	:	84.00	91.00	79.00			
IA	:	65.00	72.00	76.00	67.00	66.00	66.00
74.00							
KS	:	59.00	58.00	58.00	57.00	57.00	58.00
69.00							
KY	:	66.00	64.00	66.00	73.00	80.00	77.00
74.00							
MI	:	65.00	75.00	75.00	70.00	65.00	70.00
80.00							
MN	:	53.00	53.00	58.00	54.00	51.00	51.00
62.00							
MO	:	60.00	62.00	62.00	62.00	60.00	61.00
60.00							
MT	:	57.00	56.00	55.00	55.00	58.00	59.00
58.00							
NE	:	44.00	43.00	43.00	48.00	49.00	51.00
47.00							
NV	:	85.00	98.00	55.00	75.00	92.00	79.00
64.00							
NM	:	94.00	97.00	99.00	97.00	102.00	94.00
91.00							
NY	:	80.00	70.00	69.00	68.00	69.00	55.00
75.00							
ND	:	32.00	36.00	32.00	35.00	36.00	34.00
35.00							
OH	:	60.00	60.00	60.00	75.00	80.00	90.00
90.00							
OK	:	60.00	61.00	67.00	57.00	60.00	66.00
60.00							
OR	:	76.00	76.00	76.00	74.00	74.00	74.00
74.00							
PA	:	93.00	101.00	99.00	91.00	95.00	99.00
101.00							
SD	:	48.00	55.00	51.00	58.00	47.00	47.00
48.00							
TX	:	71.00	75.00	95.00	95.00	91.00	94.00
76.00							
UT	:	40.00	40.00	40.00	45.00	45.00	43.00
45.00							
WA	:	124.00	132.00	140.00	143.00	144.00	146.00
140.00							
WI	:	60.00	45.00	60.00	40.00	50.00	55.00
56.00							
WY	:	60.00	58.00	60.00	63.00	64.00	67.00
67.00							
	:						

US	71.10	76.80	76.40	78.20	74.10	73.60	73.10

See footnotes at end of table. -- continued

Prices Received: Other Hay, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Nov	Dec	Jan 2/	Feb	Mar	Apr	May
	Dollars per Ton						
	1997-98						
AZ	68.00	80.00	102.00	91.00	86.00		61.00
CA	98.00	108.00	103.00	107.00	87.00	104.00	106.00
CO	110.00	110.00	110.00	105.00	106.00	105.00	98.00
ID	70.00	75.00	80.00	90.00	80.00	65.00	55.00
IL	84.00	87.00	86.00	81.00	80.00	80.00	76.00
IA	75.00	74.00	75.00	71.00	69.00	73.00	67.00
KS	72.00	74.00	72.00	76.00	66.00	64.00	65.00
KY	71.00	68.00	67.00	70.00	70.00	72.00	73.00
MI	100.00	95.00	100.00	90.00	90.00	95.00	85.00
MN	63.00	68.00	64.00	52.00	55.00	41.00	57.00
MO	65.00	65.00	65.00	65.00	65.00	65.00	66.00
MT	71.00	70.00	66.00	66.00	63.00	60.00	61.00
NE	62.00	62.00	63.00	56.00	57.00	56.00	54.00
NV	85.00	95.00	95.00	90.00	95.00	91.00	93.00
NM	95.00	97.00	92.00	96.00	102.00	96.00	98.00
NY	88.00	85.00	92.00	106.00	76.00	76.00	89.00

ND	:	42.00	42.00	41.00	40.00	41.00	37.00
38.00							
OH	:	95.00	90.00	90.00	80.00	80.00	70.00
75.00							
OK	:	51.00	59.00	45.00	66.00	58.00	65.00
66.00							
OR	:	95.00	95.00	90.00	95.00	94.00	94.00
95.00							
PA	:	125.00	129.00	131.00	133.00	131.00	129.00
117.00							
SD	:	65.00	60.00	60.00	55.00	45.00	45.00
41.00							
TX	:	63.00	62.00	62.00	60.00	60.00	57.00
60.00							
UT	:	72.00	70.00	70.00	68.00	67.00	60.00
60.00							
WA	:	151.00	146.00	138.00	137.00	144.00	123.00
137.00							
WI	:	65.00	65.00	65.00	70.00	80.00	81.00
70.00							
WY	:	80.00	80.00	80.00	80.00	79.00	71.00
71.00							
	:						
US	:	75.80	76.10	76.40	76.80	76.30	72.20
78.60							
	:						
	:				1996-97		
	:						
AZ	:	87.00	75.00	60.00	60.00	50.00	74.00
132.00							
AR 3/:							
CA	:	68.00	83.00	89.00	87.00	89.00	92.00
91.00							
CO	:	87.00	88.00	98.00	95.00	100.00	110.00
115.00							
ID	:	84.00	83.00	85.00	89.00	90.00	76.00
74.00							
IL	:	85.00	87.00	92.00	92.00	96.00	96.00
92.00							
IN 3/:							
IA	:	77.00	73.00	77.00	75.00	77.00	74.00
77.00							
KS	:	70.00	70.00	70.00	73.00	75.00	71.00
68.00							
KY	:	72.00	68.00	67.00	69.00	68.00	66.00
63.00							
MI	:	90.00	100.00	115.00	105.00	110.00	100.00
110.00							
MN	:	60.00	73.00	74.00	75.00	71.00	70.00
67.00							
MO	:	61.00	61.00	66.00	64.00	65.00	64.00
65.00							
MT	:	60.00	72.00	88.00	93.00	93.00	95.00
89.00							

NE	44.00	49.00	51.00	49.00	51.00	50.00
53.00						
NV	85.00	84.00	85.00	100.00	85.00	90.00
86.00						
NM	101.00	98.00	101.00	104.00	108.00	103.00
103.00						
NY	65.00	79.00	76.00	79.00	84.00	89.00
85.00						
ND	35.00	37.00	40.00	45.00	45.00	47.00
44.00						
OH	100.00	115.00	115.00	120.00	100.00	100.00
110.00						
OK	60.00	60.00	75.00	60.00	54.00	59.00
59.00						
OR	76.00	76.00	80.00	80.00	82.00	85.00
80.00						
PA	105.00	113.00	114.00	118.00	111.00	107.00
111.00						
SD	47.00	53.00	58.00	62.00	64.00	64.00
67.00						
TX	76.00	79.00	80.00	78.00	78.00	72.00
71.00						
UT	48.00	46.00	53.00	53.00	53.00	55.00
55.00						
WA	147.00	138.00	138.00	132.00	137.00	142.00
137.00						
WI	61.00	70.00	74.00	68.00	70.00	70.00
65.00						
WY	67.00	70.00	74.00	80.00	85.00	85.00
85.00						
US	73.30	73.90	79.40	77.40	80.10	82.30
83.40						

1/ April - March for AZ; May - April for AR, CA, GA, KS, KY, MO, NV, NM, OK,
TX and UT; June - May for all other estimated States; April - May for US.
2/ Second year.
3/ Estimates discontinued.

Prices Received: Dry Beans, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	Sep	Oct	Nov	Dec	Jan 2/	Feb
	Dollars per Cwt					
	1997-98					

:					
CA :	31.10	30.00	29.70	29.60	29.10
28.60					
CO :	15.50	15.70	17.80	19.20	22.10
22.90					
ID :	18.90	19.30	19.60	20.30	21.70
22.50					
MI :	14.70	16.70	18.00	20.90	20.90
20.10					
MN :	15.90	16.00	16.50	17.70	18.60
20.60					
NE :	16.80	16.40	17.40	18.60	20.80
21.10					
ND :	14.60	14.60	16.00	18.10	19.00
19.90					
:					
US :	16.20	16.90	18.60	20.30	21.10
21.20					
:					
:			1996-97		
:					
CA :	37.20	36.10	37.70	38.70	38.90
39.60					
CO :	26.00	23.60	23.20	22.20	21.30
21.10					
ID :	25.00	25.10	24.10	24.00	24.20
24.50					
MI :	24.10	24.00	22.90	22.00	21.40
20.10					
MN :	26.50	24.40	26.10	21.90	23.50
21.30					
NE :	24.30	23.10	20.70	19.90	19.20
19.10					
ND :	22.00	22.20	21.30	20.60	19.80
19.10					
:					
US :	24.40	24.00	25.10	24.10	23.20
23.60					

See footnotes at end of table. --
continued

Prices Received: Dry Beans, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State :	Mar :	Apr :	May :	Jun :	Jul :	Aug
:			Dollars per Cwt			

			1997-98			
CA	28.10	28.60	27.80	28.60	30.40	31.20
CO	19.90	2150	21.00	21.60	21.50	20.20
ID	22.00	21.80	21.60	22.00	21.40	21.10
MI	18.80	20.00	18.80	19.00	19.00	17.10
MN	19.80	17.70	17.20	18.00	21.10	19.70
NE	21.00	20.30	19.70	20.40	20.30	19.70
ND	17.60	17.90	16.90	18.00	19.20	17.50
US	20.20	20.80	20.80	20.90	21.30	19.60
			1996-97			
CA	39.50	39.40	39.60	38.70	39.10	37.80
CO	19.90	19.70	19.90	20.40	19.40	18.30
ID	23.70	23.00	23.10	23.40	23.00	20.40
MI	20.60	20.90	18.90	18.50	17.30	15.60
MN	21.90	17.40	18.30	17.30	18.90	3/
NE	19.40	19.00	19.50	19.40	18.80	17.70
ND	18.10	16.90	16.10	17.40	17.10	15.50
US	23.30	23.00	22.20	21.20	21.90	20.40

1/ September - August for all estimated States.
2/ Second year.
3/ Price not published to avoid disclosure of individual buyers.

Prices Received: Peanuts, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	Aug	Sep	Oct	Nov	Dec	Jan 2/	Feb

	Dollars per Pound			
		1997-98		
AL	.301	.278	.283	
FL	.282	.276	.327	
GA	.300	.307	.299	.304
NC		.271	.253	.330
TX	.263	.242	.230	.288
VA	.319	.290	.293	.350
US	.297	.279	.250	.307
		1996-97		
AL	.287	.275	.263	.286
FL	.286	.278	.281	
GA	.299	.296	.296	.314
NC	.292	.283	.250	.244
TX	.251	.235	.268	.316
VA	.295	.294	.250	.262
US	.294	.276	.271	.281

1/ August - February for all estimated States.
2/ Second year.

Prices Received: All Rice, United States by Month,
for Marketing Years, 1995-96 through 1997-98 1/

Year	Aug	Sep	Oct	Nov	Dec	Jan 2/
	Dollars per Cwt					
1997-98:	9.94	9.92	10.00	9.82	9.77	9.57
1996-97:	10.10	10.00	9.66	9.41	9.82	9.95
1995-96:	7.77	8.01	8.84	9.21	9.45	9.36

	Feb	Mar	Apr	May	Jun	Jul

	Dollars per Cwt					
1997-98:	9.75	9.67	9.40	9.38	9.58	9.58
1996-97:	10.10	10.20	10.30	10.20	9.90	10.00
1995-96:	9.19	9.20	9.35	9.73	9.77	9.81

1/ August - July for US.
2/ Second year.

Prices Received: Cottonseed, by State and Month,
for Marketing Year, August 1997 - February 1998 1/

State	Aug	Sep	Oct	Nov	Dec	Jan	Feb
	Dollars Per Ton						
AL			109.00	112.00	110.00	111.00	
AZ		2/	130.00	137.00	135.00	130.00	
AR			106.00	106.00	111.00	2/	
CA		2/	171.00	175.00	177.00	2/	
FL							
GA		101.00	105.00	108.00	109.00	109.00	107.00
KS							
LA			110.00	110.00	120.00		
MS			100.00	112.00	110.00	2/	
MO							
NM							
NC		2/	109.00	116.00	115.00	111.00	
OK							
SC							
TN			115.00	115.00	120.00	120.00	
TX	112.00	111.00	120.00	116.00	113.00	111.00	108.00
VA							
US	112.00	115.00	119.00	124.00	122.00	121.00	107.00

1/ Revised. Monthly prices available only for major cotton producing states.
2/ Not published to avoid disclosure of individual operations.

Prices Received: Upland Cotton, by State and Month,
for Marketing Years, 1996-97 and 1997-98

State	Aug	Sep	Oct	Nov	Dec	Jan 1/
	Dollars per Pound					
	1997-98					
AL	2/	2/	.682	.685	.680	.669
AZ	2/	.692	.666	.650	.640	.606
AR	.661	.687	.684	.676	.634	.632
CA	.684	2/	.769	.747	.697	.734
GA	.695	.700	.722	.716	.680	.638
LA	.629	.658	.677	.666	.635	.641
MS	.679	.689	.667	.660	.637	.637
NC	2/	.741	.688	.682	.654	.641
TN	.634	.642	.658	.699	.637	.617
TX	.682	.668	.646	.625	.581	.559
US	.670	.696	.694	.679	.638	.611
	1996-97					
AL	2/	2/	.729	.700	.726	.705
AZ	.677	.729	.670	.683	.721	.688
AR	.750	.730	.733	.707	.711	.675
CA	.770	.776	.756	.770	.775	.766
GA	.777	.740	.727	.730	.704	.689
LA	.736	.705	.691	.664	.657	.646
MS	.735	.726	.717	.689	.660	.663
NC	.722	.722	.733	.746	.703	.714
TN	.750	.705	.706	.669	.675	.668
TX	.705	.691	.654	.650	.654	.634
US	.719	.716	.715	.697	.693	.679

See footnotes at end of table. -- continued

Prices Received: Upland Cotton, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued)

State	Feb	Mar	Apr	May	Jun	Jul
	Dollars per Pound					

			1997-98			
AL	.649	.643	.631	2/	.690	2/
AZ	.609	.614	.583	.582	.703	2/
AR	.664	.643	.617	.633	.673	.665
CA	.713	.713	.686	.715	.775	2/
GA	.629	.634	.615	.645	.685	.677
LA	.629	.625	.610	.633	.652	.652
MS	.633	.631	.640	.644	.676	.665
NC	.638	.656	.626	.630	.689	2/
TN	.627	.629	.630	.630	.685	.665
TX	.579	.591	.599	.608	.679	.703
US	.625	.639	.636	.635	.697	.680
			1996-97			
AL	676	.671	2/	2/	2/	.677
AZ	.690	.737	.688	.704	2/	2/
AR	.667	.671	.674	.662	.670	.663
CA	.776	.774	.737	.755	.745	.743
GA	.680	.688	.664	.695	.675	.697
LA	.655	.647	.622	.616	.636	.625
MS	.671	.674	.662	.660	.655	.661
NC	.701	.711	.678	.694	.691	2/
TN	.662	.665	.642	.636	.638	.654
TX	.656	.653	.653	.660	.668	.669
US	.681	.693	.676	.683	.671	.675

1/ Second year.
2/ Insufficient sales to establish a price.

Prices Received: All Barley, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
			Dollars per Bushel				
			1997-98				
CA	3.08	2.90	3/	2.90	3/	3/	3/
CO	3.03	2.56	3.24	3.14	2.92	3.02	2.74
ID	2.70	3.13	2.99	2.93	2.72	2.66	2.98

MN	:	2.22	2.06	2.02	1.84	1.86	2.09
1.95							
MT	:	2.62	2.42	2.83	3.00	2.72	2.76
3.01							
ND	:	2.08	2.07	1.95	1.87	1.94	2.13
2.10							
OR	:	2.68	2.50	2.56	2.28	2.47	2.43
2.49							
SD	:	2.35	2.43	2.12	2.08	2.30	2.44
2.42							
UT	:	2.74	2.57	2.36	2.25	2.26	2.33
2.38							
WA	:	2.49	2.65	2.40	2.28	2.38	2.32
2.37							
WY	:	2.46	2.32	3.29	3.32	3.39	3.37
3.09							
	:						
US	:	2.29	2.25	2.27	2.35	2.38	2.44
2.61							
	:						
	:				1996-97		
	:						
CA	:	4.01	4.13	3.85	3.76	3.42	3/
3.04							
CO	:	3/	3/	3.18	3.15	3.04	3.03
2.99							
ID	:	3.58	3.56	3.29	3.38	3.15	2.83
3.13							
MN	:	3.02	3.18	2.96	2.74	2.48	2.29
2.32							
MT	:	3.34	3.28	3.26	3.27	3.25	3.05
3.19							
ND	:	3.18	3.49	3.10	2.74	2.51	2.58
2.27							
OR	:	3.69	3.83	3.13	3.02	2.77	2.60
2.56							
SD	:	3.42	3.32	2.91	2.74	2.69	2.41
2.65							
UT	:	3.84	3.73	3.25	2.98	3.08	3.05
2.96							
WA	:	3.39	3.48	3.02	2.99	2.71	2.45
2.43							
WY	:	3.24	3.36	3.12	3.36	3.33	3.37
3.28							
	:						
US	:	3.45	3.55	3.17	2.99	2.78	2.69
2.65							

See footnotes at end of table. --

continued

Prices Received: All Barley, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
				1997-98			
CA	3/	2.83	2.80	2.76	3/	3/	2.34
CO	2.14	2.15	2.50	2.40	2.49	2.16	2.04
ID	2.84	2.78	2.91	2.97	2.61	2.68	2.22
MN	1.88	1.77	1.69	1.79	1.75	1.82	1.73
MT	2.88	2.92	2.79	2.82	2.52	2.26	2.22
ND	2.01	2.04	1.95	1.96	1.87	1.78	1.85
OR	2.38	2.45	2.22	2.18	2.38	2.04	2.21
SD	2.35	2.28	2.02	2.08	2.14	2.42	2.24
UT	2.38	2.34	2.34	2.29	2.37	2.15	2.14
WA	2.29	2.23	2.11	2.24	1.97	1.90	1.87
WY	3.40	3.12	2.94	2.94	2.79	1.92	2.10
US	2.43	2.42	2.42	2.40	2.16	2.13	1.93
				1996-97			
CA	3/	3.06	3/	3.03	3/	3.08	2.90
CO	3.10	2.64	2.41	2.40	2.61	3.03	2.56
ID	3.07	3.23	3.10	3.06	2.74	2.70	3.13
MN	2.26	2.25	2.17	2.20	2.24	2.22	2.06
MT	3.12	2.93	3.10	2.71	2.56	2.62	2.42
ND	2.26	2.24	2.22	2.17	2.10	2.08	2.07
OR	2.72	2.66	2.61	2.55	2.57	2.68	2.50

SD	2.37	2.27	2.29	2.46	2.20	2.35	2.43
UT	2.60	2.63	2.59	2.69	2.74	2.74	2.57
WA	2.42	2.54	2.39	2.49	2.47	2.49	2.65
WY	3.51	2.99	3.35	3.48	2.59	2.46	2.32
US	2.67	2.52	2.45	2.37	2.29	2.29	2.25

1/ June - May for CA; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Not published to avoid disclosure of individual operations.

Prices Received: Feed Barley, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
CA	3.08	2.90	3/	2.90	3/	3/	3/
CO	3.03	2.56	2.20	2.09	2.08	2.02	2.30
ID	2.51	2.56	2.37	2.23	2.25	2.41	2.38
MN	2.01	2.04	1.82	1.73	1.81	1.80	1.81
MT	2.24	2.27	2.17	2.06	2.03	2.13	2.29
ND	1.98	1.94	1.74	1.73	1.82	1.93	1.84
OR	2.62	2.50	2.50	2.28	2.42	2.43	2.47
SD	2.17	2.08	1.93	1.78	1.77	1.89	1.76
UT	2.74	2.57	2.36	2.25	2.26	2.33	2.38
WA	2.54	2.47	2.39	2.27	2.33	2.29	2.32
WY	2.46	2.32	3/	.668			
TX	.705	.691	.654	.650	.654	.634	

US	.719	.716	.715	.697	.693	.679

See footnotes at end of table. --
continued

Prices Received: Upland Cotton, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued)

State	Feb	Mar	Apr	May	Jun	Jul
	Dollars per Pound					
	1997-98					
AL	.649	.643	.631	2/	.690	2/
AZ	.609	.614	.583	.582	.703	2/
AR	.664	.643	.617	.633	.673	.665
CA	.713	.713	.686	.715	.775	2/
GA	.629	.634	.615	.645	.685	.677
LA	.629	.625	.610	.633	.652	.652
MS	.633	.631	.640	.644	.676	.665
NC	.638	.656	.626	.630	.689	2/
TN	.627	.629	.630	.630	.685	.665
TX	.579	.591	.599	.608	.679	.703
US	.625	.639	.636	.635	.697	.680
	1996-97					
AL	676	.671	2/	2/	2/	.677
AZ	.690	.737	.688	.704	2/	2/
AR	.667	.671	.674	.662	.670	.663
CA	.776	.774	.737	.755	.745	.743
GA	.680	.688	.664	.695	.675	.697
LA	.655	.647	.622	.616	.636	.625
MS	.671	.674	.662	.660	.655	.661
NC	.701	.711	.678	.694	.691	2/
TN	.662	.665	.642	.636	.638	.654
TX	.656	.653	.653	.660	.668	.669
US	.681	.693	.676	.683	.671	.675

1/ Second year.
2/ Insufficient sales to establish a price.

Prices Received: All Barley, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
CA	3.08	2.90	3/	2.90	3/	3/	3/
CO	3.03	2.56	3.24	3.14	2.92	3.02	2.74
ID	2.70	3.13	2.99	2.93	2.72	2.66	2.98
MN	2.22	2.06	2.02	1.84	1.86	2.09	1.95
MT	2.62	2.42	2.83	3.00	2.72	2.76	3.01
ND	2.08	2.07	1.95	1.87	1.94	2.13	2.10
OR	2.68	2.50	2.56	2.28	2.47	2.43	2.49
SD	2.35	2.43	2.12	2.08	2.30	2.44	2.42
UT	2.74	2.57	2.36	2.25	2.26	2.33	2.38
WA	2.49	2.65	2.40	2.28	2.38	2.32	2.37
WY	2.46	2.32	3.29	3.32	3.39	3.37	3.09
US	2.29	2.25	2.27	2.35	2.38	2.44	2.61
	1996-97						
CA	4.01	4.13	3.85	3.76	3.42	3/	3.04
CO	3/	3/	3.18	3.15	3.04	3.03	2.99
ID	3.58	3.56	3.29	3.38	3.15	2.83	3.13
MN	3.02	3.18	2.96	2.74	2.48	2.29	2.32
MT	3.34	3.28	3.26	3.27	3.25	3.05	3.19
ND	3.18	3.49	3.10	2.74	2.51	2.58	2.27
OR	3.69	3.83	3.13	3.02	2.77	2.60	2.56
SD	3.42	3.32	2.91	2.74	2.69	2.41	2.65

UT	3.84	3.73	3.25	2.98	3.08	3.05
2.96						
WA	3.39	3.48	3.02	2.99	2.71	2.45
2.43						
WY	3.24	3.36	3.12	3.36	3.33	3.37
3.28						
US	3.45	3.55	3.17	2.99	2.78	2.69
2.65						

See footnotes at end of table. -- continued

Prices Received: All Barley, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						
CA	3/	2.83	2.80	2.76	3/	3/	2.34
CO	2.14	2.15	2.50	2.40	2.49	2.16	2.04
ID	2.84	2.78	2.91	2.97	2.61	2.68	2.22
MN	1.88	1.77	1.69	1.79	1.75	1.82	1.73
MT	2.88	2.92	2.79	2.82	2.52	2.26	2.22
ND	2.01	2.04	1.95	1.96	1.87	1.78	1.85
OR	2.38	2.45	2.22	2.18	2.38	2.04	2.21
SD	2.35	2.28	2.02	2.08	2.14	2.42	2.24
UT	2.38	2.34	2.34	2.29	2.37	2.15	2.14
WA	2.29	2.23	2.11	2.24	1.97	1.90	1.87
WY	3.40	3.12	2.94	2.94	2.79	1.92	2.10
US	2.43	2.42	2.42	2.40	2.16	2.13	1.93

			1996-97			
CA	3/	3.06	3/	3.03	3/	3.08
2.90						
CO	3.10	2.64	2.41	2.40	2.61	3.03
2.56						
ID	3.07	3.23	3.10	3.06	2.74	2.70
3.13						
MN	2.26	2.25	2.17	2.20	2.24	2.22
2.06						
MT	3.12	2.93	3.10	2.71	2.56	2.62
2.42						
ND	2.26	2.24	2.22	2.17	2.10	2.08
2.07						
OR	2.72	2.66	2.61	2.55	2.57	2.68
2.50						
SD	2.37	2.27	2.29	2.46	2.20	2.35
2.43						
UT	2.60	2.63	2.59	2.69	2.74	2.74
2.57						
WA	2.42	2.54	2.39	2.49	2.47	2.49
2.65						
WY	3.51	2.99	3.35	3.48	2.59	2.46
2.32						
US	2.67	2.52	2.45	2.37	2.29	2.29
2.25						

1/ June - May for CA; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Not published to avoid disclosure of individual operations.

Prices Received: Feed Barley, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
			Dollars per Bushel				
			1997-98				
CA	3.08	2.90	3/	2.90	3/	3/	3/
CO	3.03	2.56	2.20	2.09	2.08	2.02	2.30
ID	2.51	2.56	2.37	2.23	2.25	2.41	2.38

MN	:	2.01	2.04	1.82	1.73	1.81	1.80
1.81							
MT	:	2.24	2.27	2.17	2.06	2.03	2.13
2.29							
ND	:	1.98	1.94	1.74	1.73	1.82	1.93
1.84							
OR	:	2.62	2.50	2.50	2.28	2.42	2.43
2.47							
SD	:	2.17	2.08	1.93	1.78	1.77	1.89
1.76							
UT	:	2.74	2.57	2.36	2.25	2.26	2.33
2.38							
WA	:	2.54	2.47	2.39	2.27	2.33	2.29
2.32							
WY	:	2.46	2.32	3/	1.94	2.20	1.92
1.92							
	:						
US	:	2.26	2.14	1.96	1.96	2.09	2.17
2.15							
	:						
	:				1996-97		
	:						
CA	:	4.01	4.13	3.85	3.76	3.42	3/
3.04							
CO	:	3/	3/	3.16	3.06	2.80	2.62
2.57							
ID	:	3.59	3.64	3.65	3.14	2.82	2.60
2.51							
MN	:	3.00	3.17	2.83	2.72	2.45	2.25
2.23							
MT	:	3.30	3.22	3.27	2.81	2.58	2.44
2.35							
ND	:	2.95	3.17	2.80	2.46	2.26	2.20
2.14							
OR	:	3.69	3.83	3.13	3.02	2.77	2.60
2.55							
SD	:	3.17	3.17	2.81	2.58	2.62	2.34
2.50							
UT	:	3.84	3.73	3.25	2.98	3.08	3.05
2.96							
WA	:	3.39	3.48	3.02	2.96	2.67	2.38
2.38							
WY	:	3.24	3.36	3.30	3.06	2.77	2.83
2.85							
	:						
US	:	3.43	3.57	3.12	2.75	2.43	2.40
2.30							

See footnotes at end of table. -- continued

Prices Received: Feed Barley, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						
CA	3/	2.83	2.80	2.76	3/	3/	2.34
CO	2.14	2.15	2.21	2.32	2.02	2.16	2.04
ID	2.16	2.37	2.42	2.33	2.26	2.22	2.21
MN	1.77	1.72	1.65	1.64	1.51	1.50	1.64
MT	2.01	2.13	2.14	2.04	2.02	1.92	2.06
ND	1.84	1.82	1.75	1.68	1.55	1.54	1.53
OR	2.38	2.37	2.22	2.18	2.38	2.04	2.21
SD	1.85	1.90	1.91	1.76	1.86	1.90	1.52
UT	2.38	2.34	2.34	2.29	2.37	2.15	2.14
WA	2.26	2.15	2.08	2.19	1.91	1.83	1.84
WY	2.04	2.07	2.00	2.11	1.90	1.92	2.10
US	2.03	2.09	2.02	1.99	1.90	1.91	1.82
	1996-97						
CA	3/	3.06	3/	3.03	3/	3.08	2.90
CO	2.51	2.61	2.41	2.40	2.61	3.03	2.56
ID	2.66	2.63	2.63	2.51	2.61	2.51	2.56
MN	2.21	2.05	2.15	1.98	1.94	2.01	2.04
MT	2.35	2.34	2.34	2.37	2.22	2.24	2.27
ND	2.07	2.04	2.03	2.01	1.99	1.98	1.94
OR	2.66	2.59	2.58	2.55	2.57	2.62	2.50

SD	2.14	1.99	1.90	2.10	2.05	2.17
2.08						
UT	2.60	2.63	2.59	2.69	2.74	2.74
2.57						
WA	2.41	2.50	2.39	2.45	2.42	2.54
2.47						
WY	2.78	2.76	2.50	2.75	2.59	2.46
2.32						
US	2.31	2.29	2.23	2.21	2.26	2.26
2.14						

1/ June - May for CA; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Not published to avoid disclosure of individual operations.

Prices Received: Malting Barley, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
				1997-98			
ID	3.01	3.48	3.31	3.21	3.17	3.01	3.10
MN	2.27	2.12	2.09	2.42	1.99	2.25	3/
MT	3.29	2.97	3.29	3.23	3.14	3.07	3.19
ND	2.21	2.17	2.08	2.08	2.32	2.41	2.33
SD	2.48	2.47	2.18	2.35	2.52	2.65	2.47
WA	2.32	3.12	3/	2.90	2.87	2.72	2.86
US	2.32	2.38	2.45	2.82	2.93	2.81	2.92
				1996-97			
ID	3.57	3.36	3.20	3.44	3.28	3.10	3.31
MN	3.30	3.21	3.05	2.95	2.52	2.86	2.60

MT	3.43	3.45	3.26	3.37	3.42	3.46
3.47						
ND	3.53	3.63	3.34	2.87	2.75	2.75
2.44						
SD	3.55	3.61	3.23	2.98	2.74	2.66
2.72						
WA	3/	3/	3/	3.52	3.19	3.04
3.10						
US	3.52	3.52	3.22	3.14	3.03	3.01
3.04						

See footnotes at end of table. -- continued

Prices Received: Malting Barley, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
				1997-98			
ID	3.17	3.13	3.18	3.23	2.95	2.97	2.78
MN	1.99	1.95	2.02	2.15	2.04	2.25	1.90
MT	3.14	3.06	3.11	3.07	2.74	2.77	2.75
ND	2.16	2.16	2.20	2.18	2.19	2.07	2.06
SD	2.48	2.37	2.28	2.40	2.45	2.49	2.30
WA	2.77	2.62	3/	2.96	2.61	3/	2.80
US	2.75	2.66	2.86	2.73	2.50	2.52	2.10
				1996-97			
ID	3.27	3.49	3.36	3.33	3.22	3.01	3.48
MN	2.41	2.28	2.23	2.23	2.24	2.27	2.12
MT	3.43	3.34	3.49	3.17	3.13	3.29	2.97

ND	2.39	2.39	2.27	2.27	2.18	2.21	2.17
SD	2.51	2.39	2.47	2.52	2.43	2.48	2.47
WA	2.93	3.02	3.00	2.61	3.02	2.32	3.12
US	2.96	2.69	2.63	2.46	2.31	2.32	2.38

1/ June - May for CA; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Not published to avoid disclosure of individual operations.

Prices Received: Oats, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
IL	2.30	2.25	1.77	1.69	1.61	1.63	3/
IA	2.12	1.93	1.63	1.58	1.51	1.56	1.92
MI	2.41	2.42	2.01	1.83	1.72	2.02	1.63
MN	1.80	1.73	1.54	1.45	1.42	1.49	1.56
MT	1.80	1.65	3/	1.32	1.22	1.22	3/
NE	1.97	2.14	1.82	1.80	1.61	1.58	1.94
ND	1.48	1.49	1.37	1.31	1.28	1.42	1.45
OH	2.27	2.18	2.06	1.75	1.76	1.72	1.81
OR	2.08	2.07	2.10	1.94	1.83	1.79	1.76
PA	2.33	2.24	1.91	1.77	1.92	1.89	1.88
SD	1.76	1.72	1.57	1.56	1.53	1.59	1.55
TX	3/	2.04	1.91	3/	3/	3/	3/

WI	1.90	1.81	1.65	1.44	1.41	1.45	1.45
US	1.86	1.81	1.67	1.57	1.47	1.62	1.66
				1996-97			
CA 4/	2.56	2.15	2.09				
IL	2.37	2.23	2.40	2.23	2.19	2.24	2.46
IA	2.48	2.29	2.26	2.17	2.05	2.05	1.95
MI	2.77	2.82	2.59	2.39	2.34	2.38	2.21
MN	2.15	2.10	2.04	1.87	1.80	1.63	1.77
MT	3/	2.23	2.13	2.10	1.82	1.87	1.70
NE	2.66	2.28	2.13	2.12	2.12	1.82	2.46
NY 4/	2.25						
ND	2.26	2.00	1.94	1.84	1.62	1.63	1.64
OH	2.58	2.51	2.52	2.46	2.34	2.58	2.45
OR	2.27	2.41	2.21	2.22	2.50	2.17	2.22
PA	2.63	2.44	2.18	2.25	2.01	2.21	2.10
SD	2.27	2.09	2.05	1.91	1.81	1.83	1.62
TX	3.55	2.81	2.96	3/	3/	3/	3/
WI	2.11	2.02	2.04	1.88	1.80	1.86	1.80
US	2.48	2.17	2.13	2.00	1.83	1.84	1.85

See footnotes at end of table. -- continued

Prices Received: Oats, by State and Month,
for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun

	:	Dollars per Bushel					
	:						
	:	1997-98					
	:						
IL	:	3/	1.82	1.75	3/	1.40	3/ 1.65
IA	:	1.83	1.76	1.80	1.76	1.78	1.66 1.55
MI	:	1.79	1.79	1.91	1.98	1.89	1.90 1.75
MN	:	1.58	1.42	1.49	1.51	1.51	1.35 1.44
MT	:	3/	3/	1.42	1.42	3/	3/ 3/
NE	:	1.61	1.81	1.62	1.81	1.81	1.65 1.66
ND	:	1.34	1.36	1.29	1.32	1.33	1.32 1.10
OH	:	1.72	1.90	1.71	1.73	1.67	1.78 1.63
OR	:	1.81	1.85	1.65	1.78	1.89	1.76 1.52
PA	:	1.96	1.94	1.90	1.95	1.75	1.74 1.66
SD	:	1.52	1.52	1.62	1.67	1.57	1.46 1.31
TX	:	3/	3/	3/	3/	3/	1.41 1.36
WI	:	1.51	1.48	1.52	1.51	1.52	1.45 1.34
	:						
US	:	1.57	1.60	1.60	1.64	1.61	1.53 1.39
	:						
	:	1996-97					
	:						
CA 4/:							
IL	:	2.22	2.28	2.16	2.30	2.37	2.30 2.25
IA	:	2.04	2.01	2.06	2.09	203	2.12 1.93
MI	:	2.25	2.19	2.33	2.45	2.49	2.41 2.42
MN	:	1.63	1.63	1.67	1.83	1.78	1.80 1.73
MT	:	1.81	1.52	1.93	2.05	2.00	1.80 1.65
NE	:	1.95	1.99	2.09	2.01	2.10	1.97 2.14
NY 4/:							
ND	:	1.51	1.53	1.50	1.53	1.62	1.48 1.49
OH	:	2.14	2.26	2.13	2.23	2.24	2.27 2.18

OR	2.15	2.19	2.06	2.04	2.07	2.08	2.07
PA	2.24	2.32	2.33	2.44	2.27	2.33	2.24
SD	1.60	1.77	1.78	1.75	1.75	1.76	1.72
TX	3/	3/	3/	3/	2.50	2.45	2.04
WI	2.12	1.92	1.96	1.92	1.94	1.90	1.81
US	1.72	1.83	1.81	1.91	1.87	1.86	1.81

1/ May - April for TX; June - May for CA; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Insufficient sales to establish a price.
4/ Estimates discontinued.

Prices Received: All Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
AR	3/	3.58	3.28	3.48	3.50	3.49	3.35
CA	4.20	4.01	3/	3/	3.73	3.92	3/
CO	4.17	3.67	3.20	3.33	3.31	3.21	3.16
ID	3.88	3.89	3.69	3.42	3.46	3.28	3.33
IL	3.76	3.06	3.08	3.18	3.41	3.35	3.29
IN	3.58	3.26	3.13	3.30	3.39	3.39	3.38
KS	4.20	3.24	3.14	3.36	3.38	3.33	3.25
MI	3.44	3.00	3.20	3.40	3.46	3.40	3.30
MN	3.99	3.78	3.54	3.77	3.67	3.49	3.58

MO	:	3.79	3.06	3.05	3.36	3.32	3.13
3.14							
MT	:	4.20	4.02	3.95	3.94	3.68	3.73
3.68							
NE	:	4.08	3.52	3.24	3.37	3.42	3.28
3.17							
ND	:	4.09	3.79	3.90	4.15	4.18	4.05
4.05							
OH	:	3.56	3.23	3.24	3.32	3.39	3.22
3.14							
OK	:	4.19	3.28	3.10	3.39	3.42	3.39
3.33							
OR	:	4.37	4.06	3.84	3.87	3.84	3.70
3.73							
SD	:	3.91	3.72	3.44	3.53	3.52	3.46
3.48							
TX	:	3.84	3.41	3.11	3.34	3.36	3.26
3.12							
WA	:	4.33	3.93	3.72	3.67	3.67	3.67
3.42							
	:						
US	:	4.08	3.52	3.23	3.56	3.66	3.58
3.54							
	:						
	:				1996-97		
	:						
AZ 5/	:	5.45					
AR	:	4.37	4.39	4.55	4.41	4.18	3.93
3.94							
CA	:	5.54	5.37	4.79	4.81	4.76	4.41
4.32							
CO	:	5.59	5.50	4.78	4.60	4.19	4.17
4.16							
GA 5/	:	4.51					
ID	:	5.15	5.16	5.11	4.36	4.39	4.02
3.92							
IL	:	5.71	4.27	4.20	4.24	4.10	3.82
3.59							
IN	:	5.49	4.42	4.09	4.00	4.12	3.62
3.24							
KS	:	6.34	5.38	5.02	4.64	4.22	4.23
4.17							
MI	:	4/	4/	4.07	4.05	3.84	3.79
3.56							
MN	:	5.64	5.87	5.17	4.69	4.59	4.26
4.31							
MO	:	4/	4.52	4.23	4.12	3.96	3.85
3.81							
MT	:	5.49	5.32	5.30	4.96	4.44	4.27
4.19							
NE	:	5.91	5.63	4.77	4.58	4.07	4.06
4.17							
ND	:	5.86	5.65	5.20	4.80	4.45	4.37
4.14							

OH	4/	4.73	4.05	4.04	4.13	3.96
3.67						
OK	6.10	5.48	4.87	4.54	4.16	4.12
4.14						
OR	5.46	5.80	4.71	4.72	4.50	4.10
3.90						
SD	6.10	5.84	4.85	4.39	4.06	4.00
3.89						
TX	5.96	5.42	4.96	4.52	4.12	4.10
4.09						
WA	5.66	5.72	5.21	4.92	4.51	3.98
3.92						
US	5.75	5.25	4.73	4.57	4.37	4.17
4.10						

See footnotes at end of table. -- continued

Prices Received: All Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						
AR	3.35	3.30	3.20	3.10	2.89	2.80	2.88
CA	3/	3/	3/	3.13	3.13	3.73	2.99
CO	3.25	3.17	3.18	3.25	3.08	2.92	2.87
ID	3.10	3.10	2.95	2.85	2.80	2.64	2.52
IL	3.29	3.27	3.24	3.27	3.05	2.88	2.54
IN	3.20	3.20	3.04	2.99	2.56	2.55	2.50
KS	3.13	3.09	3.14	3.14	2.89	2.91	2.71
MI	2.93	3.10	3.07	3.06	2.77	2.59	2.60
MN	3.49	3.39	3.34	3.47	3.42	3.41	3.30
MO	3.10	3.04	3.01	2.98	2.74	2.63	2.46

MT	:	3.82	3.59	3.43	3.49	3.56	3.43
3.34							
NE	:	3.12	3.13	3.15	3.19	3.03	3.00
2.79							
ND	:	3.77	3.89	3.58	3.70	3.56	3.33
3.42							
OH	:	3.08	3.08	2.98	2.96	2.67	2.62
2.50							
OK	:	3.18	3.11	3.13	3.14	2.88	2.77
2.62							
OR	:	3.50	3.50	3.39	3.34	3.09	3.09
2.56							
SD	:	3.42	3.41	3.34	3.45	3.34	3.27
3.04							
TX	:	3.19	3.05	3.12	3.07	2.89	2.97
2.66							
WA	:	3.42	3.31	3.27	3.25	2.97	3.03
2.69							
	:						
US	:	3.44	3.32	3.27	3.33	3.18	3.06
2.77							
	:						
	:				1996-97		
	:						
AZ 5/:							
AR	:	3.84	3.86	3.76	3.78	4.05	3.73
3.58							
CA	:	4.20	4.82	4.38	4.54	4.34	4.20
4.01							
CO	:	4.09	4.20	4.06	4.07	4.25	4.17
3.67							
GA 5/:							
ID	:	4.11	3.86	3.59	3.59	3.76	3.88
3.89							
IL	:	3.75	3.81	3.37	3.61	3.90	3.76
3.06							
IN	:	3.17	3.42	3.27	3.33	3.81	3.58
3.26							
KS	:	4.20	4.21	4.12	4.20	4.39	4.20
3.24							
MI	:	3.77	3.47	3.20	3.43	3.73	3.44
3.00							
MN	:	3.99	4.03	3.84	3.94	4.08	3.99
3.78							
MO	:	3.78	3.98	3.75	3.77	4.10	3.79
3.06							
MT	:	4.34	4.13	4.07	4.03	4.12	4.20
4.02							
NE	:	4.02	4.11	4.09	4.05	4.24	4.08
3.52							
ND	:	4.00	4.03	3.93	3.92	4.14	4.09
3.79							
OH	:	3.69	3.74	3.56	3.70	3.82	3.56
3.23							

OK	4.10	4.06	3.97	4.09	4.29	4.19
3.28						
OR	4.03	3.97	3.80	3.83	4.16	4.37
4.06						
SD	3.94	3.83	3.75	3.85	4.01	3.91
3.72						
TX	4.18	4.14	4.05	4.08	4.18	3.84
3.41						
WA	3.82	3.91	3.78	3.91	4.14	4.33
3.93						
US	4.06	4.02	3.89	3.93	4.10	4.08
3.52						

1/ May - April for AZ, CA, GA, OK and TX; June - May for AR, IL, IN, KS and MO; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Price not published to avoid disclosure of individual buyers.
4/ Insufficient sales to establish a price.
5/ Estimates discontinued.

Prices Received: Winter Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
AR	3/	3.58	3.28	3.48	3.50	3.49	3.35
CA	3/	3/	3/	3/	3.71	3/	3/
CO	4.18	3.68	3.20	3.33	3.29	3.22	3.13
ID	3.89	3.94	3.64	3.44	3.44	3.35	3.25
IL	3.76	3.06	3.08	3.18	3.41	3.35	3.29
IN	3.58	3.26	3.13	3.30	3.39	3.39	3.38
KS	4.20	3.24	3.14	3.36	3.38	3.33	3.25
MI	3.44	3.00	3.20	3.40	3.46	3.40	3.30

MN	:	3.71	4.11	3/	3.28	3.40	3.28	3.07
MO	:	3.79	3.06	3.05	3.36	3.32	3.13	3.14
MT	:	4.22	4.04	3.97	3.86	3.37	3.58	3.43
NE	:	4.08	3.52	3.24	3.37	3.42	3.28	3.17
ND	:		3.10	3.15	3.30	3.75	3.22	4/
OH	:	3.56	3.23	3.24	3.32	3.39	3.22	3.14
OK	:	4.19	3.28	3.10	3.39	3.42	339	3.33
OR	:	4.37	4.08	3.83	3.86	3.83	3.67	3.72
SD	:	3.93	3.66	3.25	3.19	3.22	3.26	3.28
TX	:	3.84	3.41	3.11	3.34	3.36	3.26	3.12
WA	:	4.30	3.91	3.72	3.61	3.60	3.66	3.40
	:							
US	:	4.09	3.42	3.16	3.40	3.46	3.44	3.31
	:							
	:				1996-97			
	:							
AZ 5/	:							
AR	:	4.37	4.39	4.55	4.41	4.18	3.93	3.94
CA	:	5.99	5.45	4.69	3/	3/	4.13	4.26
CO	:	5.59	5.50	4.78	4.60	4.19	4.18	4.16
GA 5/	:	4.51						
ID	:	5.17	5.44	4.83	4.47	4.38	4.04	3.94
IL	:	5.71	4.27	4.20	4.24	4.10	3.82	3.59
IN	:	5.49	4.42	4.09	4.00	4.12	3.62	3.24
KS	:	6.34	5.38	5.02	4.64	4.22	4.23	4.17
MI	:	3/	3/	4.07	4.05	3.84	3.79	3.56
MN	:	3/	3/	5.34	4.48	4.36	3/	3/
MO	:	3/	4.52	4.23	4.12	3.96	3.85	3.81
MT	:	5.62	5.45	5.15	5.04	4.53	4.28	4.12
NE	:	5.91	5.63	4.77	4.58	4.07	4.06	4.17

ND	5.81	5.23	5.34	4.19	3.97	3.92	3.42
OH	3/	4.73	4.05	4.04	4.13	3.96	3.67
OK	6.10	5.48	4.87	4.54	4.16	4.12	4.14
OR	5.46	5.80	4.71	4.72	4.51	4.11	3.90
SD	5.98	5.54	4.69	4.29	4.09	3.87	3.94
TX	5.96	5.42	4.96	4.52	4.12	4.10	4.09
WA	5.63	5.54	5.21	4.89	4.49	3.95	3.89
US	5.81	5.14	4.67	4.51	4.28	4.06	4.04

See footnotes at end of table. -- continued

Prices Received: Winter Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						
AR	3.35	3.30	3.20	3.10	2.89	2.80	2.88
CA	3/	3/	3/	3/	3.13	3.11	2.99
CO	3.25	3.17	3.20	3.25	3.08	2.92	2.88
ID	3.08	3.03	2.99	2.85	2.79	2.56	2.49
IL	3.29	3.27	3.24	3.27	3.05	2.88	2.54
IN	3.20	3.20	3.04	2.99	2.56	2.55	2.50
KS	3.13	3.09	3.14	3.14	2.89	2.91	2.71
MI	2.93	3.10	3.07	3.06	2.77	2.59	2.60
MN	3.10	3/	3/	3/	3/	3/	3/

MO	3.10	3.04	3.01	2.98	2.74	2.63
2.46						
MT	3.59	3.35	3.25	3.19	3.27	3.06
2.81						
NE	3.12	3.13	3.15	3.19	3.03	3.00
2.79						
ND	3.52	2.82	4/	3.11	4/	2.97
2.70						
OH	3.08	3.08	2.98	2.96	2.67	2.62
2.50						
OK	3.18	3.11	3.13	3.14	2.88	2.77
2.62						
OR	3.49	3.48	3.37	3.34	3.06	3.09
2.56						
SD	3.24	3.14	3.16	3.09	2.95	2.81
2.51						
TX	3.19	3.05	3.12	3.07	2.89	2.97
2.66						
WA	3.40	3.26	3.24	3.23	2.95	2.99
2.68						
US	3.24	3.16	3.16	3.16	2.94	2.90
2.68						
			1996-97			
AZ 5/						
AR	3.84	3.86	3.76	3.78	4.05	3.73
3.58						
CA	3/	4.25	4.32	4.51	4.34	3/
3/						
CO	4.09	4.21	4.07	4.08	4.26	4.18
3.68						
GA 5/						
IDh,						

for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
			Dollars per Bushel				
				1997-98			
AR	3.35	3.30	3.20	3.10	2.89	2.80	2.88
CA	3/	3/	3/	3.13	3.13	3.73	2.99
CO	3.25	3.17	3.18	3.25	3.08	2.92	2.87
ID	3.10	3.10	2.95	2.85	2.80	2.64	2.52

IL	:	3.29	3.27	3.24	3.27	3.05	2.88
2.54							
IN	:	3.20	3.20	3.04	2.99	2.56	2.55
2.50							
KS	:	3.13	3.09	3.14	3.14	2.89	2.91
2.71							
MI	:	2.93	3.10	3.07	3.06	2.77	2.59
2.60							
MN	:	3.49	3.39	3.34	3.47	3.42	3.41
3.30							
MO	:	3.10	3.04	3.01	2.98	2.74	2.63
2.46							
MT	:	3.82	3.59	3.43	3.49	3.56	3.43
3.34							
NE	:	3.12	3.13	3.15	3.19	3.03	3.00
2.79							
ND	:	3.77	3.89	3.58	3.70	3.56	3.33
3.42							
OH	:	3.08	3.08	2.98	2.96	2.67	2.62
2.50							
OK	:	3.18	3.11	3.13	3.14	2.88	2.77
2.62							
OR	:	3.50	3.50	3.39	3.34	3.09	3.09
2.56							
SD	:	3.42	3.41	3.34	3.45	3.34	3.27
3.04							
TX	:	3.19	3.05	3.12	3.07	2.89	2.97
2.66							
WA	:	3.42	3.31	3.27	3.25	2.97	3.03
2.69							
	:						
US	:	3.44	3.32	3.27	3.33	3.18	3.06
2.77							
	:						
	:				1996-97		
	:						
AZ 5/:							
AR	:	3.84	3.86	3.76	3.78	4.05	3.73
3.58							
CA	:	4.20	4.82	4.38	4.54	4.34	4.20
4.01							
CO	:	4.09	4.20	4.06	4.07	4.25	4.17
3.67							
GA 5/:							
ID	:	4.11	3.86	3.59	3.59	3.76	3.88
3.89							
IL	:	3.75	3.81	3.37	3.61	3.90	3.76
3.06							
IN	:	3.17	3.42	3.27	3.33	3.81	3.58
3.26							
KS	:	4.20	4.21	4.12	4.20	4.39	4.20
3.24							
MI	:	3.77	3.47	3.20	3.43	3.73	3.44
3.00							

MN	3.99	4.03	3.84	3.94	4.08	3.99	3.78
MO	3.78	3.98	3.75	3.77	4.10	3.79	3.06
MT	4.34	4.13	4.07	4.03	4.12	4.20	4.02
NE	4.02	4.11	4.09	4.05	4.24	4.08	3.52
ND	4.00	4.03	3.93	3.92	4.14	4.09	3.79
OH	3.69	3.74	3.56	3.70	3.82	3.56	3.23
OK	4.10	4.06	3.97	4.09	4.29	4.19	3.28
OR	4.03	3.97	3.80	3.83	4.16	4.37	4.06
SD	3.94	3.83	3.75	3.85	4.01	3.91	3.72
TX	4.18	4.14	4.05	4.08	4.18	3.84	3.41
WA	3.82	3.91	3.78	3.91	4.14	4.33	3.93
US	4.06	4.02	3.89	3.93	4.10	4.08	3.52

1/ May - April for AZ, CA, GA, OK and TX; June - May for AR, IL, IN, KS and MO; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Price not published to avoid disclosure of individual buyers.
4/ Insufficient sales to establish a price.
5/ Estimates discontinued.

Prices Received: Winter Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
AR	3/	3.58	3.28	3.48	3.50	3.49	3.35
CA	3/	3/	3/	3/	3.71	3/	3/

CO	:	4.18	3.68	3.20	3.33	3.29	3.22	3.13
ID	:	3.89	3.94	3.64	3.44	3.44	3.35	3.25
IL	:	3.76	3.06	3.08	3.18	3.41	3.35	3.29
IN	:	3.58	3.26	3.13	3.30	3.39	3.39	3.38
KS	:	4.20	3.24	3.14	3.36	3.38	3.33	3.25
MI	:	3.44	3.00	3.20	3.40	3.46	3.40	3.30
MN	:	3.71	4.11	3/	3.28	3.40	3.28	3.07
MO	:	3.79	3.06	3.05	3.36	3.32	3.13	3.14
MT	:	4.22	4.04	3.97	3.86	3.37	3.58	3.43
NE	:	4.08	3.52	3.24	3.37	3.42	3.28	3.17
ND	:		3.10	3.15	3.30	3.75	3.22	4/
OH	:	3.56	3.23	3.24	3.32	3.39	3.22	3.14
OK	:	4.19	3.28	3.10	3.39	3.42	339	3.33
OR	:	4.37	4.08	3.83	3.86	3.83	3.67	3.72
SD	:	3.93	3.66	3.25	3.19	3.22	3.26	3.28
TX	:	3.84	3.41	3.11	3.34	3.36	3.26	3.12
WA	:	4.30	3.91	3.72	3.61	3.60	3.66	3.40
	:							
US	:	4.09	3.42	3.16	3.40	3.46	3.44	3.31
	:							
	:				1996-97			
	:							
AZ	5/:							
AR	:	4.37	4.39	4.55	4.41	4.18	3.93	3.94
CA	:	5.99	5.45	4.69	3/	3/	4.13	4.26
CO	:	5.59	5.50	4.78	4.60	4.19	4.18	4.16
GA	5/:	4.51						
ID	:	5.17	5.44	4.83	4.47	4.38	4.04	3.94
IL	:	5.71	4.27	4.20	4.24	4.10	3.82	3.59
IN	:	5.49	4.42	4.09	4.00	4.12	3.62	3.24

KS	6.34	5.38	5.02	4.64	4.22	4.23	4.17
MI	3/	3/	4.07	4.05	3.84	3.79	3.56
MN	3/	3/	5.34	4.48	4.36	3/	3/
MO	3/	4.52	4.23	4.12	3.96	3.85	3.81
MT	5.62	5.45	5.15	5.04	4.53	4.28	4.12
NE	5.91	5.63	4.77	4.58	4.07	4.06	4.17
ND	5.81	5.23	5.34	4.19	3.97	3.92	3.42
OH	3/	4.73	4.05	4.04	4.13	3.96	3.67
OK	6.10	5.48	4.87	4.54	4.16	4.12	4.14
OR	5.46	5.80	4.71	4.72	4.51	4.11	3.90
SD	5.98	5.54	4.69	4.29	4.09	3.87	3.94
TX	5.96	5.42	4.96	4.52	4.12	4.10	4.09
WA	5.63	5.54	5.21	4.89	4.49	3.95	3.89
US	5.81	5.14	4.67	4.51	4.28	4.06	4.04

See footnotes at end of table. -- continued

Prices Received: Winter Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						
AR	3.35	3.30	3.20	3.10	2.89	2.80	2.88
CA	3/	3/	3/	3/	3.13	3.11	2.99
CO	3.25	3.17	3.20	3.25	3.08	2.92	2.88

ID	3.08	3.03	2.99	2.85	2.79	2.56	2.49
IL	3.29	3.27	3.24	3.27	3.05	2.88	2.54
IN	3.20	3.20	3.04	2.99	2.56	2.55	2.50
KS	3.13	3.09	3.14	3.14	2.89	2.91	2.71
MI	2.93	3.10	3.07	3.06	2.77	2.59	2.60
MN	3.10	3/	3/	3/	3/	3/	3/
MO	3.10	3.04	3.01	2.98	2.74	2.63	2.46
MT	3.59	3.35	3.25	3.19	3.27	3.06	2.81
NE	3.12	3.13	3.15	3.19	3.03	3.00	2.79
ND	3.52	2.82	4/	3.11	4/	2.97	2.70
OH	3.08	3.08	2.98	2.96	2.67	2.62	2.50
OK	3.18	3.11	3.13	3.14	2.88	2.77	2.62
OR	3.49	3.48	3.37	3.34	3.06	3.09	2.56
SD	3.24	3.14	3.16	3.09	2.95	2.81	2.51
TX	3.19	3.05	3.12	3.07	2.89	2.97	2.66
WA	3.40	3.26	3.24	3.23	2.95	2.99	2.68
US	3.24	3.16	3.16	3.16	2.94	2.90	2.68
				1996-97			
AZ 5/:							
AR	3.84	3.86	3.76	3.78	4.05	3.73	3.58
CA	3/	4.25	4.32	4.51	4.34	3/	3/
CO	4.09	4.21	4.07	4.08	4.26	4.18	3.68
GA 5/:							
ID	3.96	3.86	3.66	3.69	3.87	3.89	3.94
IL	3.75	3.81	3.37	3.61	3.90	3.76	3.06
IN	3.17	3.42	3.27	3.33	3.81	3.58	3.26
KS	4.20	4.21	4.12	4.20	4.39	4.20	3.24

MI	3.77	3.47	3.20	3.43	3.73	3.44
3.00						
MN	3/	3.91	3.40	3.65	4.01	3.71
4.11						
MO	3.78	3.98	3.75	3.77	4.10	3.79
3.06						
MT	4.31	4.14	4.07	4.01	4.11	4.22
4.04						
NE	4.02	4.11	4.09	4.05	4.24	4.08
3.52						
ND	3.63	3.71	4.26	4/	4/	4/
3.10						
OH	3.69	3.74	3.56	3.70	3.82	3.56
3.23						
OK	4.10	4.05	3.97	4.09	4.29	4.19
3.28						
OR	4.05	3.98	3.79	3.81	4.15	4.37
4.08						
SD	3.89	3.82	3.77	3.83	3.94	3.93
3.66						
TX	4.18	4.14	4.05	4.08	4.18	3.84
3.41						
WA	3.78	3.90	3.75	3.89	4.12	4.30
3.91						
US	4.04	4.03	3.90	3.98	4.14	4.09
3.42						

1/ May - April for AZ, CA, GA, OK and TX; June - May for AR, IL, IN, KS and
MO; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Price not published to avoid disclosure of individual buyers.
4/ Insufficient sales to establish a price.
5/ Estimates discontinued.

Prices Received: Other Spring Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
	1997-98						
CO	3.39	3.39	2.96	3.45	3.56	3.14	3.33
ID	3.86	3.84	3.75	3.39	3.48	3.21	3.43

MN	3.99	3.76	3.54	3.82	3.67	3.48	3.60
MT	417	3.99	3.85	3.85	3.62	3.58	3.57
ND	3.93	3.63	3.65	3.71	3.61	3.51	3.54
OR	4.38	3.88	3.89	3.93	3.91	3.75	3.78
SD	3.90	3.75	3.59	3.72	3.65	3.57	3.63
WA	4.50	4.09	3.74	4.01	4.00	3.75	3.52
US	3.99	3.75	3.66	3.74	3.64	3.50	3.55
			1996-97				
CO	3/	3/	4.50	4.53	4.22	3.54	4.20
ID	5.13	4.96	5.35	4.19	4.41	3.99	3.90
MN	4.91	5.31	5.18	4.70	4.59	4.27	4.31
MT	5.46	5.26	5.36	4.79	4.37	4.27	4.21
ND	5.82	5.64	5.29	4.71	4.36	4.25	3.95
OR	5.81	5.33	4.76	4.75	4.43	3.98	3.87
SD	6.14	5.98	5.40	4.46	4.05	4.08	3.83
WA	5.88	6.28	5.19	5.09	4.63	4.23	4.13
US	5.68	5.50	5.28	4.63	4.41	4.21	4.07

See footnotes at end of table. -- continued

Prices Received: Other Spring Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	1997-98						

	:						
CO	:	3.23	2.92	2.72	3.14	3.06	2.95
2.66							
ID	:	3.11	3.16	2.91	2.85	2.81	2.71
2.56							
MN	:	3.50	3.40	3.34	3.48	3.43	3.43
3.30							
MT	:	3.73	3.50	3.42	3.54	3.55	3.54
3.41							
ND	:	3.50	3.43	3.34	3.44	3.35	3.25
3.26							
OR	:	3.57	3.55	3.46	3.43	3.18	3.12
2.56							
SD	:	3.57	3.52	3.49	3.60	3.58	3.53
3.31							
WA	:	3.54	3.56	3.47	3.38	3.12	3.25
2.79							
	:						
US	:	3.51	3.44	3.33	3.43	3.37	3.31
3.22							
	:						
	:				1996-97		
	:						
CO	:	3.88	3.92	3.58	3.68	4.14	3.39
3.39							
ID	:	4.23	3.86	3.53	3.50	3.65	3.86
3.84							
MN	:	3.99	4.03	3.84	3.94	4.08	3.99
3.76							
MT	:	4.31	4.13	4.05	4.03	4.13	4.17
3.99							
ND	:	3.84	3.89	3.79	3.83	4.05	3.93
3.63							
OR	:	3.85	3.83	3.89	4.00	4.25	4.38
3.88							
SD	:	3.97	3.83	3.72	3.86	4.04	3.90
3.75							
WA	:	4.08	4.02	4.04	4.10	4.30	4.50
4.09							
	:						
US	:	4.03	3.95	3.80	3.84	4.03	3.99
3.75							

1/ May - April for AZ, CA, GA, OK and TX; June - May for AR, IL, IN, KS and MO; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Insufficient sales to establish a price.

Prices Received: Durum Wheat, by State and Month,
for Marketing Years, 1996-97 and 1997-98 1/

State	May	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Bushel						
				1997-98			
CA	4.35	3/	4/	4/	3/	3/	3/
MN	4/	4.60	4/	4/	3/	3/	3/
MT	4.40	4.20	4.43	4.96	5.51	5.62	5.65
ND	4.37	4.19	4.63	5.26	5.34	5.10	5.27
SD	4.15	4.14	4.12	4.00	3/	4.92	4/
US	4.37	4.20	4.61	5.23	5.35	5.14	5.29
				1996-97			
AZ 5/	5.45						
CA	3/	3/	3/	3/	3/	3/	3/
MN	4.65	3/	3/	3/	3/	3.90	422
MT	5.32	5.65	5.16	5.36	4.85	4.27	4.68
ND	5.96	5.69	5.10	4.96	4.66	4.80	4.48
SD	5.84	4.33	4.75	5.23	4.19	4.38	3.85
US	5.76	5.56	5.10	4.97	4.67	4.78	4.48

See footnotes at end of table. -- continued

Prices Received: Durum Wheat, by State and Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

State	Dec	Jan 2/	Feb	Mar	Apr	May	Jun

	Dollars per Bushel					
			1997-98			
CA	3/	4/	3/	3/	4/	3/
MN	4/	4/	4/	4/	4/	4/
MT	5.57	5.30	4.95	4.97	4.88	4.73
ND	5.08	4.98	4.63	4.66	4.55	4.08
SD	3/	3/	3/	4/	3/	4.50
US	5.16	5.02	4.69	4.70	4.60	4.28
			1996-97			
AZ 5/						
CA	5.21	3/	5.03	4.99	4.24	4.35
MN	5.00	4.34	4/	4.28	4/	4/
MT	5.30	4.18	4.43	4.28	4.13	4.40
ND	4.48	4.42	4.32	4.32	4.39	4.37
SD	4/	4/	4.26	4.56	4.37	4.15
US	4.53	4.44	4.32	4.33	4.38	4.37

Year	May	Jun	Jul	Aug	Sep	Oct	Nov

1/ May - April for AZ, CA, GA, OK and TX; June - May for AR, IL, IN, KS and MO; July - June for all other estimated States; June - May for US.
2/ Second year.
3/ Price not published to avoid disclosure of individual buyers.
4/ Insufficient sales to establish a price.
5/ Estimates discontinued.

Prices Received: Wheat by Class, United States, by Month, for Marketing Years, 1996-97 and 1997-98 1/

	Dollars per Bushel					
	All Hard Red					
1997	4.05	3.46	3.22	3.51	3.53	3.45
3.43						
1996	5.83	5.46	4.98	4.61	4.35	4.22
4.12						
	Soft Red Winter					
1997	3.66	3.47	3.15	3.30	3.39	3.28
3.28						
1996	4.61	4.40	4.17	4.12	4.11	3.89
3.72						
	White					
1997	4.05	3.90	3.61	3.59	3.57	3.49
3.38						
1996	5.38	5.21	4.85	4.62	4.40	3.96
3.86						

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continued

Prices Received: Wheat by Class, United States, by Month, for Marketing Years, 1996-97 and 1997-98 (continued) 1/

Year	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
	Dollars per Bushel						
	All Hard Red						
1997	3.39	3.25	3.25	3.31	3.17	3.09	
1996	4.10	4.05	3.95	3.99	4.13	4.05	3.46
	Soft Red Winter						
1997	3.15	3.12	3.07	3.10	2.87	2.71	2.69
1996	3.75	3.80	3.58	3.70	3.90	3.66	3.47
	White						

1997	3.26	3.21	3.11	3.05	2.89	2.82
2.57						
1996	3.87	3.83	3.64	3.69	3.92	4.05
3.90						

1/ June - May
2/ Second year.

Tobacco: Prices Received Monthly, by State and United States, July 1997 - April 1998

State	1997						1998			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
	Dollars per Pound									
FL	1.555	1.655	1.820	1.790						
GA	1.590	1.640	1.800	1.760						
IN					1.900	1.915	1.875	1.805	1.770	1.670
KY					1.905	1.925	1.915	1.880	1.775	1.715
MD									1.770	1.645
MO					1.890	1.895	1.895			
NC	1.530	1.565	1.750	1.780	1.760	1.880	1.815			
OH					1.875	1.885	1.875	1.810	1.600	
SC	1.630	1.670	1.800	1.795						
TN					1910	1.910	2.000	2.085	2.180	
VA		1.600	1.690	1.795	1.810	1.935	1.880			
WV					1.870	1.900	1.850	1.695		
US	1.580	1.595	1.755	1.785	1.845	1.920	1.920	1.915	1.810	1.695

Tobacco: Prices Received Monthly, by State and United States, July 1998 - April 1999 1/

State	1998						1999			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
	Dollars per Pound									
FL	1.420	1.630	1.800	1.770						
GA	1.460	1.580	1.795	1.780						
IN					1.910	1.910	1.900	1.830		
KY					1.910	1.915	1.930	1.905	1.815	
MD									1.710	1.505

MO	:				1.905	1.915	1.900	1.895		
NC	:	1.690	1.635	1.805	1.885	1.835	1.905	1.860		
OH	:					1.900	1.910	1.915	1.855	
SC	:	1.745	1.580	1.770	1.795					
TN	:					1.925	1.910	1.990	2.255	2.135
VA	:		1.690	1.780	1.890	1.885	1.905	1.850		
WV	:									
	:									
US	:	1.630	1.625	1.795	1.865	1.905	1.915	1.930	1.965	1.810 1.505

1/ Revised.

Tobacco: Prices Received Monthly by Class, Type, State, and United States, July 1997 - April 1998

Class and State	Type	1997				
		Jul	Aug	Sep	Oct	Nov	Dec
		Dollars per Pound					
Flue-cured:							
Old Belts							
NC	11		1.510	1.680	1.790	1.760	
VA	11		1.600	1.690	1.795	1.780	
US	11		1.545	1.685	1.790	1.765	
Eastern NC Belt							
NC	12	1.540	1.565	1.765	1.780	1.750	
NC Border & SC Belt							
NC	13	1.520	1.620	1.790	1.780	1.720	
SC	13	1.630	1.670	1.805	1.795		
US	13	1.595	1.650	1.795	1.785	1.720	
GA-FL Belt							
FL	14	1.555	1.655	1.820	1.790		
GA	14	1.590	1.640	1.800	1.760		
US	14	1.585	1.645	1.805	1.765		
Total Flue-cured	11-14	1.580	1.595	1.755	1.785	1.760	
Fire-cured:							
VA Belt							
VA	21						2.120
Eastern District							
KY	22						
TN	22						
US	22						
Western District							
KY	23						
TN	23						
US	23						

KY-TN Fire-cured	22-23							
Total Fire-cured	21-23							
2.120								
Air-cured:								
Light Air-cured:								
Burley								
IN	31						1.900	
1.915								
KY	31						1.905	
1.920								
MO	31						1.890	
1.895								
NC	31						1.870	
1.880								
OH	31						1.875	
1.885								
TN	31						1.910	
1.910								
VA	31						1.910	
1.915								
WV	31						1.870	
1.900								
US	31						1.905	
1.915								
Southern MD Belt								
MD	32							
Total Light Air-cured	31-32						1.905	
1.915								
Dark Air-cured:								
One Sucker Belt								
KY	35							
2.050								
TN	35							
2.065								
US	35							
2.055								
Green River Belt								
KY	36							
2.090								
KY-TN Dark Air-cured	35-36							
2.065								
VA Sun-cured Belt								
VA	37							
1.900								
Total Dark Air-cured	35-37							
2.060								
Total All Classes	11-37	1.580	1.595	1.755	1.785	1.845		
1.920								

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continued

Tobacco: Prices Received Monthly by Class, Type, State and United States, July 1997 - April 1998 1/ (continued)

Class and State	Type	1998			
		Jan	Feb	Mar	Apr
		Dollars per Pound			
Flue-cured:					
Old Belts					
NC	11				
VA	11				
US	11				
Eastern NC Belt					
NC	12				
NC Border & SC Belt					
NC	13				
SC	13				
US	13				
GA-FL Belt					
FL	14				
GA	14				
US	14				
Total Flue-cured	11-14				
Fire-cured:					
VA Belt					
VA	21	2.140			
Eastern District					
KY	22	2.435	2.210	2.025	3.065
TN	22	2.400	2.305	2.260	
US	22	2.410	2.270	2.185	3.065
Western District					
KY	23	2.340	2.180	1.950	
TN	23	2.340	2.180	1.950	
US	23	2.340	2.180	1.950	
KY-TN Fire-cured	22-23	2.385	2.245	2.150	3.065
Total Fire-cured	21-23	2.380	2.245	2.150	3.065
Air-cured:					
Light Air-cured:					
Burley					
IN	31	1.875	1.805	1.770	1.670
KY	31	1.885	1.810	1.755	1.700
MO	31	1.895			
NC	31	1.815	1.570		

OH	31	1.875	1.810	1.600		
TN	31	1.855	1.675	1.700		
VA	31	1.845				
WV	31	1.850	1.695			
US	31	1.880	1.800	1.755	1.700	
Southern MD Belt						
MD	32			1.770	1.645	
Total Light Air-cured	31-32	1.880	1.800	1.760	1.685	
Dark Air-cured:						
One Sucker Belt						
KY	35	1.970	1.630			
TN	35	1.910	1.715			
US	35	1.960	1.660			
Green River Belt						
KY	36	2.010	1.850			
KY-TN Dark Air-cured	35-36	1.980	1.770			
VA Sun-cured Belt						
VA	37	1.960				
Total Dark Air-cured	35-37	1.980	1.770			
Total All Classes	11-37	1.920	1.915	1.810	1.695	

1/ Revised.

Tobacco: Prices Received Monthly by Type, State and United States, July 1998 - April 1999 1/

Cure, Area and State	Type	1998					
		Jul	Aug	Sep	Oct	Nov	Dec
		Dollars per Pound					
Flue-cured:							
Old and Middle Belts							
NC	11		1.645	1.765	1.890	1.800	
VA	11		1.690	1.780	1.890	1.825	
US	11		1.660	1.770	1.890	1.805	
Eastern NC Belt							
NC	12	1.695	1.640	1.825	1.895		
NC Border & SC Belt							
NC	13	1.665	1.575	1.780	1.810		
SC	13	1.745	1.580	1.770	1.795		
US	13	1.710	1.580	1.775	1.800		
GA-FL Belt							
FL	14	1.420	1.630	1.800	1.770		
GA	14	1.460	1.580	1.795	1.780		
US	14	1.450	1.585	1.795	1.780		
Total Flue-cured	11-14	1.630	1.625	1.795	1.865	1.805	
Fire-cured:							

VA Belt								
VA		21						1.960
Eastern District								
KY		22						
TN		22						
US		22						
Western District								
KY		23						
TN		23						
US		23						
KY-TN Fire-cured		22-23						
Total Fire-cured		21-23						1.960
Air-cured:								
Light Air-cured:								
Burley								
IN		31					1.910	1.910
KY		31					1.910	1.910
MO		31					1.905	1.915
NC		31					1.920	1.905
OH		31					1.900	1.910
TN		31					1.925	1.910
VA		31					1.910	1.895
WV		31						
US		31					1910	1.910
Southern MD Belt								
MD		32						
Total Light Air-cured		31-32					1.910	1.910
Dark Air-cured:								
One Sucker Belt								
KY		35						2.010
TN		35						2.025
US		35						2.010
Green River Belt								
KY		36						2.005
KY-TN Dark Air-cured		35-36						2.010
VA Sun-cured Belt								
VA		37						1.725
Total Dark Air-cured		35-37						2.005
Total All Cures		11-37	1.630	1.625	1.795	1.865	1.905	1.915

1/ Revised.

Tobacco: Prices Received Monthly by Type, State and United States, July 1998 - April 1999 (continued)

Cure, Area and State	Type	1999			
		Jan	Feb	Mar	Apr

			Dollars per Pound		
Flue-cured:					
Old and Middle Belts					
NC	11				
VA	11				
US	11				
Eastern NC Belt					
NC	12				
NC Border & SC Belt					
NC	13				
SC	13				
US	13				
GA-FL Belt					
FL	14				
GA	14				
US	14				
Total Flue-cured	11-14				
Fire-cured:					
VA Belt					
VA	21	1.840			
Eastern District					
KY	22	2.285	2.235	2.160	
TN	22	2.235	2.290	2.135	
US	22	2.255	2.275	2.140	
Western District					
KY	23	2.180	2.115	2.030	
TN	23	2.180	2.115	2.020	
US	23	2.180	2.115	2.030	
KY-TN Fire-cured	22-23	2.230	2.240	2.130	
Total Fire-cured	21-23	2.220	2.240	2.130	
Air-cured:					
Light Air-cured:					
Burley					
IN	31	1.900	1.830		
KY	31	1.900	1.850	1.625	
MO	31	1.900	1.895		
NC	31	1.860			
OH	31	1.915	1.855		
TN	31	1.880	1.685		
VA	31	1.850			
WV	31				
US	31	1.895	1.850	1.625	
Southern MD Belt					
MD	32			1.710	1.505
Total Light Air-cured	31-32	1.895	1.850	1.695	1.505
Dark Air-cured:					
One Sucker Belt					

KY	35	1.870	1.780		
TN	35	1.825	1.600		
US	35	1.860	1.730		
Green River Belt					
KY	36	1.940	1.925		
KY-TN Dark Air-cured	35-36	1.885	1.810		
VA Sun-cured Belt					
VA	37	1.675			
Total Dark Air-cured	35-37	1.885	1.810		
Total All Cures	11-37	1.930	1.965	1.810	1.505

1/ Revised.

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1997 1/

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
AL					11.20	10.80
AK						
AZ				6.20	9.50	8.45
CA - All	8.50	8.70	9.95	11.50	8.15	9.95
Winter	15.30	14.30	22.00	20.10		
Spring					8.80	10.70
Summer						
Fall	4.75	4.80	4.70	4.60	4.50	4.40
CO - All	1.55	1.65	1.70	1.25	0.85	0.75
Fresh	1.35	1.15	1.00	0.85	0.65	0.75
DE						
FL		24.00	14.90	11.20	11.00	11.40
ID - All	3.50	3.30	3.80	3.20	3.55	2.40
Fresh	2.30	2.00	2.00	1.50	1.30	1.30
Processing	4.60	4.20	4.60	3.70	4.50	3.30

IL	:					
IN	:					
IA	:					
ME	:	4.65	4.50	4.75	5.05	4.55
4.00						
MD	:					
MA	:					
MI	:	5.85	5.45	6.05	6.65	5.90
3.00						
MN	:	4.30	4.35	4.70	4.35	4.40
1.25						
MO	:					
MT	:					
NE	:					
NV	:					
NJ	:					
NM	:					
NY	:	7.00	6.85	7.00	7.50	7.45
NC	:					
6.60						
ND - All	:	4.95	5.00	4.85	4.55	4.95
4.20						
Fresh	:	3.60	3.75	3.10	3.00	2.00
1.50						
Processing	:	5.00	5.20	5.10	5.00	5.00
4.50						
OH	:	7.00	6.75	6.20	7.05	
OR	:	4.15	4.40	4.70	4.55	4.05
3.10						
PA	:	6.95	7.35	8.10	7.80	7.75
7.65						
RI	:					
SD	:					
TX	:					8.30
8.10						
UT	:					
VA	:					
12.80						
WA - All	:	4.75	5.15	4.90	4.95	5.10
4.75						
Processing	:	5.05	5.50	5.35	5.50	5.55
5.50						
WI - All	:	4.20	4.30	4.50	3.20	2.80
2.00						
Fresh	:	2.40	1.60	1.75	1.35	1.20
1.00						
Processing	:	4.95	5.05	5.45	4.05	4.00
4.00						
WY	:					
	:					
US - All	:	4.23	4.50	4.60	4.61	5.26
4.66						
Fresh	:	3.21	3.82	3.46	3.92	4.60
5.27						

Processing	4.98	4.90	5.11	5.02	6.04	5.04

See footnote at end of table. -- continued

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1997 1/ (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec	MYA
	Dollars per Cwt						
AL	8.25	7.30	13.00				8.60
AK							20.00
AZ							8.75
CA - All	10.20	13.50	14.70	13.80	8.20	11.20	10.90
Winter						19.20	18.10
Spring	9.80						9.85
Summer	12.80	13.50	14.70	19.80			14.50
Fall	4.55			8.80	8.20	7.55	8.10
CO - All	2.85	5.50	5.70	5.10	4.75	4.45	4.60
Fresh	3.45	6.75	6.25	5.60	5.05	4.75	4.80
DE							8.25
FL							12.10
ID - All	3.05	5.50	4.80	4.75	4.60	4.50	4.50
Fresh	2.30	6.60	4.90	4.20	4.30	4.10	3.80
Processing	3.80	5.20	4.80	4.80	4.70	4.80	4.80
IL							5.50
IN							6.15

IA	:						5.45
ME	:		8.10	5.65	5.70	6.10	6.30 6.40
MD	:						6.85
MA	:						7.70
MI	:	7.65	6.20	5.80	6.05	6.15	6.10 6.45
MN	:		7.40	5.35	4.70	5.10	4.95 5.55
MO	:						5.30
MT	:						7.05
NE	:						6.15
NV	:						4.50
NJ	:						6.50
NM	:						6.05
NY	:		11.50	9.05	8.70	8.60	8.30 8.75
NC	:	6.50	8.00				6.60
ND - All	:		5.05	4.75	5.05	5.00	5.70 5.65
Fresh	:			7.25	6.50	7.00	7.20 6.95
Processing	:		5.05	4.50	4.80	4.70	4.90 5.05
OH	:	10.80	10.30	6.15	8.25	8.30	8.35 8.25
OR	:	3.45	6.25	5.15	4.65	4.95	5.15 5.20
PA	:	8.50	7.50	6.80	7.60	8.35	7.85 8.20
RI	:						7.60
SD	:						4.90
TX	:	12.10	12.00				10.30
UT	:						4.35
VA	:	10.60	9.95	10.70			10.80
WA - All	:	3.95	5.65	4.50	4.50	4.60	5.55 4.90
Processing	:	4.15	4.35	4.00	4.45	4.30	4.90 4.55

WI - All	5.95	5.90	5.15	5.40	5.15	5.25	5.70
Fresh		7.80	6.00	5.60	4.95	5.20	5.40
Processing	4.05	4.05	4.65	4.25	5.30	5.10	5.45
WY							5.05
US - All	5.52	6.26	5.09	4.93	5.13	5.29	5.62
Fresh	7.25	8.86	7.04	6.46	5.89	5.88	6.64
Processing	4.37	4.81	4.61	4.60	4.71	4.96	5.00

1/ State Marketing Year Average Prices are computed by weighting state monthly prices by estimated sales for the month during the crop year. U.S. Marketing Year Average Price is computed by weighting State Marketing Year Average Prices by estimated sales for the crop year. Monthly prices refer to all potatoes sold in a given month regardless of the year harvested.

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1998 1/

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
AL					12.30	13.20
AK						
AZ				9.10	11.90	7.50
CA - All	11.00	12.30	17.10	15.30	10.90	10.20
Winter	16.60	22.40	23.20	28.40		
Spring					12.00	10.70
Summer						
Fall	8.00	8.00	7.30	7.45	7.10	7.60
CO - All	4.50	4.45	4.75	4.30	4.05	3.90

Fresh	:	4.70	4.60	4.50	4.20	4.35
4.25						
DE	:					
FL	:	33.00	31.50	30.00	16.60	10.70
13.20						
ID - All	:	4.40	4.40	4.40	4.55	4.50
3.85						
Fresh	:	4.00	4.00	3.80	3.60	3.40
3.00						
Processing	:	4.80	4.80	4.70	4.80	4.90
4.90						
IL	:					
IN	:					
IA	:					
ME	:	6.10	6.35	6.55	6.95	6.75
6.30						
MD	:					
MA	:					
MI	:	6.30	6.55	6.65	7.25	8.05
MN	:	6.20	6.20	6.65	6.60	5.85
MO	:					
MT	:					
NE	:					
NV	:					
NJ	:					
NM	:					
NY	:	8.05	8.00	8.40	8.40	9.85
NC	:					
6.10						
ND - All	:	5.95	6.55	6.05	7.00	6.00
5.80						
Fresh	:	7.00	7.00	7.40	7.00	4.50
3.60						
Processing	:	5.10	5.80	5.15	5.35	5.80
5.85						
OH	:	8.35	8.60	8.60	9.20	
OR	:	5.40	5.30	5.95	6.05	5.75
5.10						
PA	:	7.95	9.05	10.60	9.55	9.80
9.55						
RI	:					
SD	:					
TX	:					9.35
9.10						
UT	:					
VA	:					
9.65						
WA - All	:	5.35	5.35	5.10	5.00	4.95
5.15						
Processing	:	4.90	5.00	4.85	4.90	5.35
5.15						
WI - All	:	5.55	5.70	6.80	6.55	6.35
6.50						

Fresh	5.20	4.05	4.60	3.95	4.25	5.00
Processing	5.30	5.80	7.15	7.70	7.50	7.50
WY						
US - All	5.40	5.94	6.41	6.27	6.39	6.13
Fresh	5.77	6.81	7.54	6.84	7.11	7.17
Processing	5.06	5.25	5.24	5.49	5.97	5.58

See footnote at end of table. -- continued

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1998 1/ (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec	MYA
	0						
Fresh	2.40	1.60	1.75	1.35	1.20	1.00	
Processing	4.95	5.05	5.45	4.05	4.00	4.00	
WY							
US - All	4.23	4.50	4.60	4.61	5.26	4.66	
Fresh	3.21	3.82	3.46	3.92	4.60	5.27	
Processing	4.98	4.90	5.11	5.02	6.04	5.04	

See footnote at end of table. -- continued

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1997 1/ (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec	MYA

	:	Dollars per Cwt					
	:						
AL	:	8.25	7.30	13.00			
8.60							
AK	:						
20.00							
AZ	:						
8.75							
CA - All	:	10.20	13.50	14.70	13.80	8.20	11.20
10.90							
Winter	:						19.20
18.10							
Spring	:	9.80					
9.85							
Summer	:	12.80	13.50	14.70	19.80		
14.50							
Fall	:	4.55			8.80	8.20	7.55
8.10							
CO - All	:	2.85	5.50	5.70	5.10	4.75	4.45
4.60							
Fresh	:	3.45	6.75	6.25	5.60	5.05	4.75
4.80							
DE	:						
8.25							
FL	:						
12.10							
ID - All	:	3.05	5.50	4.80	4.75	4.60	4.50
4.50							
Fresh	:	2.30	6.60	4.90	4.20	4.30	4.10
3.80							
Processing	:	3.80	5.20	4.80	4.80	4.70	4.80
4.80							
IL	:						
5.50							
IN	:						
6.15							
IA	:						
5.45							
ME	:		8.10	5.65	5.70	6.10	6.30
6.40							
MD	:						
6.85							
MA	:						
7.70							
MI	:	7.65	6.20	5.80	6.05	6.15	6.10
6.45							
MN	:		7.40	5.35	4.70	5.10	4.95
5.55							
MO	:						
5.30							
MT	:						
7.05							
NE	:						
6.15							

NV	:						4.50
NJ	:						6.50
NM	:						6.05
NY	:		11.50	9.05	8.70	8.60	8.30 8.75
NC	:	6.50	8.00				6.60
ND - All	:		5.05	4.75	5.05	5.00	5.70 5.65
Fresh	:			7.25	6.50	7.00	7.20 6.95
Processing	:		5.05	4.50	4.80	4.70	4.90 5.05
OH	:	10.80	10.30	6.15	8.25	8.30	8.35 8.25
OR	:	3.45	6.25	5.15	4.65	4.95	5.15 5.20
PA	:	8.50	7.50	6.80	7.60	8.35	7.85 8.20
RI	:						7.60
SD	:						4.90
TX	:	12.10	12.00				10.30
UT	:						4.35
VA	:	10.60	9.95	10.70			10.80
WA - All	:	3.95	5.65	4.50	4.50	4.60	5.55 4.90
Processing	:	4.15	4.35	4.00	4.45	4.30	4.90 4.55
WI - All	:	5.95	5.90	5.15	5.40	5.15	5.25 5.70
Fresh	:		7.80	6.00	5.60	4.95	5.20 5.40
Processing	:	4.05	4.05	4.65	4.25	5.30	5.10 5.45
WY	:						5.05
	:						
US - All	:	5.52	6.26	5.09	4.93	5.13	5.29 5.62
Fresh	:	7.25	8.86	7.04	6.46	5.89	5.88 6.64
Processing	:	4.37	4.81	4.61	4.60	4.71	4.96 5.00

1/ State Marketing Year Average Prices are computed by weighting state monthly prices by estimated sales for the month during the crop year. U.S. Marketing Year Average Price is computed by weighting State Marketing Year Average Prices by estimated sales for the crop year. Monthly prices refer to all potatoes sold in a given month regardless of the year harvested.

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1998 1/

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
AL					12.30	13.20
AK						
AZ				9.10	11.90	7.50
CA - All	11.00	12.30	17.10	15.30	10.90	10.20
Winter	16.60	22.40	23.20	28.40		
Spring					12.00	10.70
Summer						
Fall	8.00	8.00	7.30	7.45	7.10	7.60
CO - All	4.50	4.45	4.75	4.30	4.05	3.90
Fresh	4.70	4.60	4.50	4.20	4.35	4.25
DE						
FL	33.00	31.50	30.00	16.60	10.70	13.20
ID - All	4.40	4.40	4.40	4.55	4.50	3.85
Fresh	4.00	4.00	3.80	3.60	3.40	3.00
Processing	4.80	4.80	4.70	4.80	4.90	4.90
IL						
IN						
IA						
ME	6.10	6.35	6.55	6.95	6.75	6.30
MD						

MA	:					
MI	:	6.30	6.55	6.65	7.25	8.05
MN	:	6.20	6.20	6.65	6.60	5.85
MO	:					
MT	:					
NE	:					
NV	:					
NJ	:					
NM	:					
NY	:	8.05	8.00	8.40	8.40	9.85
NC	:					
6.10						
ND - All	:	5.95	6.55	6.05	7.00	6.00
5.80						
Fresh	:	7.00	7.00	7.40	7.00	4.50
3.60						
Processing	:	5.10	5.80	5.15	5.35	5.80
5.85						
OH	:	8.35	8.60	8.60	9.20	
OR	:	5.40	5.30	5.95	6.05	5.75
5.10						
PA	:	7.95	9.05	10.60	9.55	9.80
9.55						
RI	:					
SD	:					
TX	:					9.35
9.10						
UT	:					
VA	:					
9.65						
WA - All	:	5.35	5.35	5.10	5.00	4.95
5.15						
Processing	:	4.90	5.00	4.85	4.90	5.35
5.15						
WI - All	:	5.55	5.70	6.80	6.55	6.35
6.50						
Fresh	:	5.20	4.05	4.60	3.95	4.25
5.00						
Processing	:	5.30	5.80	7.15	7.70	7.50
7.50						
WY	:					
	:					
US - All	:	5.40	5.94	6.41	6.27	6.39
6.13						
Fresh	:	5.77	6.81	7.54	6.84	7.11
7.17						
Processing	:	5.06	5.25	5.24	5.49	5.97
5.58						

See footnote at end of table. --
continued

Potatoes: Prices Received, Monthly and Marketing Year Average by State and U.S., 1998 1/ (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec	MYA
	Dollars per Cwt						
AL	12.80						12.90
AK							2090
AZ	10.00						9.90
CA - All	10.90	10.90	11.30	9.05	9.40	11.70	11.30
Winter					18.10	20.30	22.40
Spring	9.35						10.50
Summer	14.30	10.90	11.30	13.00			12.40
Fall	11.10			7.55	6.70	7.30	7.10
CO - All	4.60	6.15	5.55	4.55	3.95	3.50	3.85
Fresh	5.10	6.65	5.90	4.75	4.05	3.50	3.80
DE							8.45
FL							14.70
ID - All	3.45	3.60	4.55	4.25	4.20	4.00	3.90
Fresh	2.40	2.80	4.40	4.10	3.70	3.30	3.30
Processing	4.50	4.80	4.60	4.30	4.40	4.40	4.30
IL							5.15
IN							5.75
IA							4.35
ME		6.20	5.40	5.85	5.90	5.90	6.25
MD							7.00
MA							6.75
MI	6.35	5.70	5.25	5.60	6.35	6.55	6.25

MN	:		7.40	4.35	4.40	4.45	5.65
5.20							
MO	:						
5.15							
MT	:						
7.95							
NE	:						
4.85							
NV	:						
4.20							
NJ	:						
7.00							
NM	:						
6.10							
NY	:		9.75	9.35	9.35	9.35	8.95
9.45							
NC	:	6.05	7.50				
6.15							
ND - All	:	5.50	6.05	5.10	5.60	5.15	5.70
5.65							
Fresh	:		4.00	5.05	5.65	5.40	5.20
5.40							
Processing	:	5.50	6.10	4.95	5.40	4.75	5.60
5.25							
OH	:	9.75	7.55	7.45	5.95	5.20	6.95
6.95							
OR	:	5.20	4.60	4.65	4.25	5.35	5.00
4.90							
PA	:		7.50	6.35	6.25	6.35	6.95
7.00							
RI	:						
6.80							
SD	:						
4.95							
TX	:	9.75	9.15				
9.35							
UT	:						
4.75							
VA	:	7.05	5.80	5.85			
6.75							
WA - All	:	4.25	5.60	5.00	4.00	4.20	5.35
4.50							
Processing	:	4.40	4.85	4.00	3.95	3.85	4.85
4.10							
WI - All	:	5.10	4.85	4.85	4.65	4.50	4.90
4.95							
Fresh	:	5.50	5.05	5.40	5.15	4.30	4.50
4.70							
Processing	:	4.85	4.45	4.60	4.35	4.65	5.00
4.65							
WY	:						
5.05							
	:						

US - All	6.03	5.55	4.91	4.43	4.81	5.03
5.24						
Fresh	7.34	6.39	5.99	5.45	5.21	5.14
6.15						
Processing	5.01	5.01	4.49	4.25	4.53	4.94
4.68						

1/ Preliminary. State Marketing Year Average Prices are computed by weighting state monthly prices by estimated sales for the month during the crop year. U.S. Marketing Year Average Price is computed by weighting state Marketing Year Average Prices by estimated sales for the crop year. Monthly prices refer to all potatoes sold in a given month regardless of the year harvested.

Peaches for Fresh Use: Monthly Average Prices Received, United States, 1991-98 1/

Year	May	Jun	Jul	Aug	Sep
	Dollars per Pound				
1998	.324	.254	.276	.267	.282
1997	.255	.193	.146	.238	.353
1996	.347	.272	.306	.316	.363
1995	.345	.205	.184	.266	.324
1994	.193	.138	.177	.176	.239
1993	.288	.220	.191	.190	.226
1992	.220	.213	.148	.222	.220
1991	.289	.236	.162	.162	.228

1/ Equivalent packinghouse-door returns for CA and WA; price at point of first sale for other states.

Pears for Fresh Use: Monthly Average Prices Received, United States, 1991-1998 1/

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Ton											

1998	269	272	272	332	385	425	360	328	372	361	352	305
1997	557	519	461	454	503	568	325	351	368	361	352	305
1996	297	301	316	313	367	584	450	383	471	505	597	561
1995	222	288	346	374	354	340	358	332	374	354	351	324
1994	235	220	202	182	172	175	148	170	278	248	271	253
1993	370	417	412	429	505	538	390	344	366	350	330	281
1992	377	383	381	394	459	2/	300	273	364	390	433	391
1991	345	377	389	402	494	793	300	342	358	399	428	414

1/ Equivalent packinghouse-door returns for CA, OR, and WA; price at point of first sale for other states.
2/ Insufficient sales to establish a price.

Grapes for Fresh Use: Monthly Average Prices Received, United States, May 1995 - December 1998

Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Ton							
1998	1/	570	580	800	580	570	600	550
1997	1060	660	480	450	550	570	840	1/
1996	1150	960	570	480	580	880	1100	1/
1995	1050	580	650	650	480	560	530	680

1/ Insufficient sales to establish a price.

Apples for Fresh Use: Prices Received, by State, July 1996 - June 1999, and United States, July 1995 - June 1999 1/

	1996	1997

State:	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
						Dollars per Lb						
CA	.309	.309	.392	.327	.287	.310	.307	.310	.225	.225		
MI		.155	.160	.180	.180	.180	.170	.170	.165	.165	.150	.150
NY			.193	.182	.184	.173	.177	.172	.172	.175	.176	
OH		.355	.332	.303	.286	.278	.280	.275	.253	.266		
PA		.200	.200	.200	.190	.190	.190	.210	.220	.220	.220	
VA		.160	.160	.150	.150	.150	.150	.138	.137	.136		
WA	.225	.246	.313	.257	.241	.235	.234	.205	.174	.150	.140	.137

	1997						1998					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
						Dollars per Lb						
CA	.499	.394	.356	.365	.297	.293	.258	.264	.297	.297		
MI		.160	.155	.150	.140	.145	.150	.155	.155	.155	.155	.155
NY			.182	.183	.167	.172	.175	.175	.178	.175	.187	
OH	.310	.289	.267	.275	.276	.273	.253	.253	.250	.246	.241	.240
PA	.200	.230	.240	.230	.270	.250	.240	.210	.190	.160		
VA			.200	.220	.215	.200	.190	.181	.180	.180		
WA	.136	.137	.245	.254	.238	.246	.233	.216	.209	.197	.179	.163

	1998						1999					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
						Dollars per Lb						
CA		.334	.306	.348	.293	.219	.183	.100	.152			
MI		.130	.140	.130	.125	.125	.125	.130	.130	.130	.130	.130
NY			.176	.177	.166	.145	.147	.148	.157	.166	.184	

OH	.260	.275	.280	.275	.269	.264	.258	.256	.255	.255	.251 .250
PA	.240	.230	.230	.240	.240	.230	.230	.230	.220	.190	.180 .180
VA			.219	.200	.191	.189	.183	.182	.185		
WA	.123	.120	.209	.201	.158	.140	.157	.150	.151	.137	.128 .125

Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2/	Feb	Mar	Apr	May	Jun
					United States							
1995	.179	.244	.262	.253	.238	.244	.254	.242	.251	.226	.219	.219
1996	.233	.252	.305	.247	.232	.227	.225	.203	.176	.156	.143	.137
1997	.146	.174	.259	.253	.230	.233	.219	.208	.205	.194	.178	.163
1998	.127	.138	.226	.221	.175	.149	.158	.150	.153	.141	.133	.127

1/ Equivalent packinghouse-door returns for CA, NY, OR and WA; price at point of first sale for other states.
2/ January of the following year.

Oranges: Average Prices and Equivalent Returns, United States
October 1995 - August 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
US		All Oranges					
Oct	17.30	9.90	11.22	-0.23	7.90	9.22	-2.24
Nov	16.70	6.03	10.07	5.26	3.98	8.06	3.21
Dec	14.50	5.79	8.11	5.40	3.76	6.13	3.35

Jan	1996	:	14.30	5.91	8.09	5.59	3.87	6.12
3.55								
Feb		:	13.70	5.89	7.52	5.37	386	5.54
3.32								
Mar		:	16.10	7.27	9.97	6.12	5.22	7.97
4.04								
Apr		:	17.20	7.66	10.97	7.04	5.58	8.96
4.94								
May		:	17.00	8.09	10.87	7.62	6.00	8.81
5.52								
Jun		:	17.20	8.30	11.12	7.31	6.21	9.05
5.21								
Jul		:	18.90	9.10	12.95	-0.48	7.02	10.87
-2.56								
Aug		:	21.30	10.99	15.40	-0.48	8.91	13.32
-2.56								
Sep		:	27.10	15.78	21.20	-0.48	13.70	19.12
-2.56								
Oct		:	23.60	12.89	17.21	-0.14	10.94	15.27
-2.13								
Nov		:	16.70	6.06	10.11	4.63	4.16	8.20
2.73								
Dec		:	14.80	5.42	8.42	4.93	3.52	6.48
3.03								
Jan	1997	:	15.10	5.49	8.83	5.02	3.59	6.89
3.12								
Feb		:	15.10	5.59	8.93	4.93	3.67	6.97
3.02								
Mar		:	15.50	6.79	9.34	5.53	4.82	7.36
3.57								
Apr		:	16.30	6.64	10.16	5.92	4.68	8.17
3.97								
May		:	17.10	6.71	10.92	5.91	4.75	8.89
3.96								
Jun		:	16.50	6.60	10.49	5.59	4.62	8.44
3.63								
Jul		:	16.80	8.56	10.90	2.88	6.48	8.82
0.80								
Aug		:	18.50	9.53	12.60	3.38	7.45	10.52
1.30								
Sep		:	18.70	9.23	12.80	3.40	7.15	10.72
1.32								
Oct		:	16.10	5.78	9.50	2.57	3.90	7.55
0.75								
Nov		:	15.10	4.20	8.66	3.31	2.41	6.73
1.56								
Dec		:	14.60	4.59	8.08	3.88	2.81	6.15
2.13								
Jan	1998	:	15.80	4.92	9.46	4.30	3.15	7.51
2.54								
Feb		:	14.40	5.53	8.14	4.99	3.73	6.19
3.22								
Mar		:	15.80	7.03	9.62	6.23	5.14	7.63
4.37								

Apr	18.10	7.67	11.95	6.72	5.79	9.96	4.86
May	17.30	7.74	11.18	6.99	5.86	9.17	5.13
Jun	17.90	8.61	11.80	7.42	6.70	9.75	5.55
Jul	16.40	8.79	10.50	2.36	6.71	8.42	0.28
Aug	15.20	7.45	9.30	2.36	5.37	7.22	0.28

Oranges: Average Prices and Equivalent Returns, Arizona
October 1995 - April 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
AZ			All Oranges				
Oct 1995	25.50	19.48	19.48		17.50	17.50	
Nov	19.30	11.20	13.28	-0.48	9.22	11.30	-2.46
Dec	15.10	7.30	9.08	-0.48	5.32	7.10	-2.46
Jan 1996	14.80	6.74	8.78	-0.48	4.76	6.80	-2.46
Feb	13.00	4.87	6.94	-0.48	2.89	4.95	-2.46
Mar	12.60	5.72	6.68	-0.48	3.68	4.63	-2.47
Apr	11.60	4.57	5.67	-0.48	2.50	3.60	-2.55
May	10.60	3.17	4.66	-0.48	1.09	2.58	-2.56
Jun	9.92	2.58	4.01	-0.48	0.51	1.94	-2.56
Jul	11.20	2.76	5.30	-0.48	0.68	3.22	-2.56
Nov	19.40	11.47	13.38	-0.28	9.49	11.40	-2.26

Dec		:	16.90	8.72	10.88	-0.28	6.74	8.90
-2.26								
Jan	1997	:	15.70	8.33	9.68	-0.08	6.35	7.70
-2.06								
Feb		:	11.50	5.31	5.48	0.60	3.33	3.50
-1.38								
Mar		:	10.50	4.43	4.53	0.64	2.39	2.49
-1.34								
Apr		:	11.60	5.68	5.70	1.08	3.60	3.62
-1.00								
May		:	11.30	5.37	5.40	1.26	3.29	3.32
-0.82								
Jun		:	8.10	2.20	2.20		0.12	0.12
		:						
Oct		:		-0.28		-0.28	-2.26	
-2.26								
Nov		:	15.20	5.83	9.18	-0.28	3.85	7.20
-2.26								
Dec		:	16.10	6.78	10.08	-0.28	4.80	8.10
-2.26								
Jan	1998	:	14.20	5.40	8.18	-0.04	3.42	6.20
-2.02								
Feb		:	9.22	2.60	3.20	0.55	0.61	1.22
-1.45								
Mar		:	11.10	4.74	5.13	0.66	2.69	3.07
-1.32								
Apr		:	11.60	5.63	5.70	0.84	3.56	3.62
-1.17								
May		:	10.40	4.49	4.50	2.36	2.41	2.42
0.28								
Jun		:	10.80	4.90	4.90		2.82	2.82
		:						
AZ		:			Navel and Miscellaneous			
		:						
Oct	1995	:	25.50	19.48	19.48		17.50	17.50
Nov		:	19.30	11.20	13.28	-0.48	9.22	11.30
-2.46								
Dec		:	15.10	7.30	9.08	-0.48	5.32	7.10
-2.46								
Jan	1996	:	14.80	6.74	8.78	-0.48	4.76	6.80
-2.46								
Feb		:	12.80	4.72	6.78	-0.48	2.74	4.80
-2.46								
Mar		:	11.90	4.13	5.88	-0.48	2.15	3.90
-2.46								
Apr		:	7.06	0.78	1.04	-0.48	-1.20	-0.94
-2.46								
May		:	5.54	-0.48	-0.48	-0.48	-2.46	-2.46
-2.46								
Jun		:	3.00	-3.02	-3.02		-5.00	-5.00
		:						
Nov		:	19.40	11.47	13.38	-0.28	9.49	11.40
-2.26								

Dec		16.90	8.72	10.88	-0.28	6.74	8.90
-2.26							
Jan	1997	15.70	8.33	9.68	-0.08	6.35	7.70
-2.06							
Feb		11.50	5.31	5.48	0.60	3.33	3.50
-1.38							
Mar		9.00	2.82	2.98	0.64	0.84	1.00
-1.34							
Oct			-0.28		-0.28	-2.26	
-2.26							
Nov		15.20	5.83	9.18	-0.28	3.85	7.20
-2.26							
Dec		16.10	6.78	10.08	-0.28	4.80	8.10
-2.26							
Jan	1998	14.20	5.40	8.18	-0.04	3.42	6.20
-2.02							
Feb		9.22	2.63	3.20	0.20	0.65	1.22
-1.78							
Mar		8.50	1.97	2.48	0.66	-0.01	0.50
-1.32							
Apr			0.66		0.66	-1.32	
-1.32							

Oranges: Average Prices and Equivalent Returns, Arizona and California
November 1995 - August 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
AZ			Valencias				
Feb	1996 15.70	8.09	9.80	-0.48	6.01	7.72	-2.56
Mar	13.00	6.85	7.10	-0.48	4.77	5.02	-2.56
Apr	12.00	4.92	6.10	-0.48	2.84	4.02	-2.56
May	10.60	3.24	4.70	-0.48	1.16	2.62	-2.56
Jun	10.60	2.95	4.70	-0.48	0.87	2.62	-2.56

Jul		11.20	2.76	5.30	-0.48	0.68	3.22	-2.56
Mar	1997	11.30	5.40	5.40		3.32	3.32	
Apr		11.60	5.68	5.70	1.08	3.60	3.62	-1.00
May		11.30	5.37	5.40	1.26	3.29	3.32	-0.82
Jun		8.10	2.20	2.20		0.12	0.12	
Feb	1998		1.96		1.96	-0.12		-0.12
Mar		11.90	6.00	6.00		3.92	3.92	
Apr		11.60	5.69	5.70	1.36	3.61	3.62	-0.72
May		10.40	4.49	4.50	2.36	2.41	2.42	0.28
Jun		10.80	4.90	4.90		2.82	2.82	
CA				All Oranges				
Nov	1995	20.00	12.31	13.98	-0.48	10.33	12.00	-2.46
Dec		15.10	8.04	9.08	-0.48	6.06	7.10	-2.46
Jan	1996	14.50	6.92	8.48	-0.48	4.94	6.50	-2.46
Feb		13.60	5.59	7.58	-0.48	3.61	5.60	-2.46
Mar		16.40	7.29	10.44	-0.48	5.30	8.45	-2.46
Apr		17.80	8.08	11.77	-0.48	6.08	9.76	-2.48
May		17.70	9.72	11.78	-0.48	7.65	9.71	-2.54
Jun		17.00	8.21	11.10	-0.48	6.13	9.02	-2.56
Jul		19.00	9.26	13.10	-0.48	7.18	11.02	-2.56
Aug		21.30	10.99	15.40	-0.48	8.91	13.32	-2.56
Sep		27.10	15.78	21.20	-0.48	13.70	19.12	-2.56
Oct		24.30	13.39	18.36	-0.44	11.33	16.31	-2.49
Nov		18.50	10.86	12.48	-0.28	8.88	10.50	-2.26
Dec		16.40	9.31	10.38	-0.28	7.33	8.40	-2.26
Jan	1997	16.20	9.15	10.18	-0.08	7.17	8.20	-2.06
Feb		15.50	8.17	9.45	0.66	6.18	7.47	-1.32

Mar		15.80	8.39	9.79	0.72	6.40	7.80
-1.27							
Apr		17.30	9.38	11.27	0.72	7.38	9.27
-1.28							
May		18.20	10.40	12.23	1.08	8.35	10.18
-0.97							
Jun		16.40	8.01	10.50	1.52	5.93	8.42
-0.56							
Jul		16.80	8.56	10.90	2.88	6.48	8.82
0.80							
Aug		18.50	9.53	12.60	3.38	7.45	10.52
1.30							
Sep		18.70	9.23	12.80	3.40	7.15	10.72
1.32							
Oct		17.60	8.58	11.63	2.84	6.52	9.58
0.77							
Nov		16.70	9.58	10.68	-0.28	7.60	8.70
-2.26							
Dec		16.00	8.84	9.98	-0.28	6.86	8.00
-2.26							
Jan	1998	17.00	9.47	10.98	-0.04	7.49	9.00
-2.02							
Feb		14.90	7.60	8.90	0.28	5.62	6.92
-1.71							
Mar		16.20	8.38	10.16	0.72	6.38	8.16
-1.26							
Apr		19.20	10.81	13.27	0.91	8.80	11.26
-1.11							
May		18.20	9.82	12.23	1.49	7.79	10.20
-0.54							
Jun		18.20	10.54	12.26	2.21	8.46	10.19
0.13							
Jul		16.40	8.79	10.50	2.36	6.71	8.42
0.28							
Aug		15.20	7.45	9.30	2.36	5.37	7.22
0.28							

Oranges: Average Prices and Equivalent Returns, California
November 1995 - August 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						

		:						
CA		:			Navels			
		:						
Nov	1995	:	20.00	12.31	13.98	-0.48	10.33	12.00
-2.46								
Dec		:	15.10	8.04	9.08	-0.48	6.06	7.10
-2.46								
Jan	1996	:	14.50	6.92	8.48	-0.48	4.94	6.50
-2.46								
Feb		:	13.60	5.59	7.58	-0.48	3.61	5.60
-2.46								
Mar		:	16.10	6.85	10.08	-0.48	4.87	8.10
-2.46								
Apr		:	17.70	7.63	11.68	-0.48	5.65	9.70
-2.46								
May		:	21.60	10.99	15.58	-0.48	9.01	13.60
-2.46								
		:						
Oct		:	26.60	15.94	20.58	-0.28	13.96	18.60
-2.26								
Nov		:	18.50	10.86	12.48	-0.28	8.88	10.50
-2.26								
Dec		:	16.40	9.31	10.38	-0.28	7.33	8.40
-2.26								
Jan	1997	:	16.20	9.15	10.18	-0.08	7.17	8.20
-2.06								
Feb		:	15.40	8.12	9.38	0.60	6.14	7.40
-1.38								
Mar		:	15.60	8.26	9.58	0.64	6.28	7.60
-1.34								
Apr		:	17.40	9.43	11.38	0.64	7.45	9.40
-1.34								
May		:	21.90	13.60	15.88	0.66	11.62	13.90
-1.32								
		:						
Oct		:	17.90	9.96	11.88	-0.28	7.98	9.90
-2.26								
Nov		:	16.70	9.58	10.68	-0.28	7.60	8.70
-2.26								
Dec		:	16.00	8.84	9.98	-0.28	6.86	8.00
-2.26								
Jan	1998	:	17.00	9.47	10.98	-0.04	7.49	9.00
-2.02								
Feb		:	14.90	7.53	8.88	0.20	5.55	6.90
-1.78								
Mar		:	15.80	7.80	9.78	0.66	5.82	7.80
-1.32								
Apr		:	19.40	10.77	13.38	0.66	8.79	11.40
-1.32								
May		:	17.20	8.44	11.18	0.66	6.46	9.20
-1.32								
Jun		:	22.30	13.37	16.28	0.66	11.39	14.30
-1.32								
		:						

CA			Valencias					
Mar	1996	:	19.20	11.85	13.30	-0.48	9.77	11.22
-2.56								
Apr		:	17.90	9.57	12.00	-0.48	7.49	9.92
-2.56								
May		:	17.20	9.53	11.30	-0.48	7.45	9.22
-2.56								
Jun		:	17.00	8.21	11.10	-0.48	6.13	9.02
-2.56								
Jul		:	19.00	9.26	13.10	-0.48	7.18	11.02
-2.56								
Aug		:	21.30	10.99	15.40	-0.48	8.91	13.32
-2.56								
Sep		:	27.10	15.78	21.20	-0.48	13.70	19.12
-2.56								
Oct		:	23.40	12.47	17.50	-0.48	10.39	15.42
-2.56								
		:						
Feb	1997	:	18.60	10.04	12.70	2.04	7.96	10.62
-0.04								
Mar		:	18.60	10.08	12.70	1.34	8.00	10.62
-0.74								
Apr		:	16.70	9.12	10.80	1.08	7.04	8.72
-1.00								
May		:	16.30	8.84	10.40	1.26	6.76	8.32
-0.82								
Jun		:	16.40	8.01	10.50	1.52	5.93	8.42
-0.56								
Jul		:	16.80	8.56	10.90	2.88	6.48	8.82
0.80								
Aug		:	18.50	9.53	12.60	3.38	7.45	10.52
1.30								
Sep		:	18.70	9.23	12.80	3.40	7.15	10.72
1.32								
Oct		:	17.40	8.08	11.50	3.26	6.00	9.42
1.18								
		:						
Feb	1998	:	15.10	8.54	9.20	1.96	6.46	7.12
-0.12								
Mar		:	17.60	11.19	11.70	1.96	9.11	9.62
-0.12								
Apr		:	19.00	10.88	13.10	1.36	8.80	11.02
-0.72								
May		:	18.90	10.92	13.00	2.36	8.84	10.92
0.28								
Jun		:	17.80	10.28	11.90	2.36	8.20	9.82
0.28								
Jul		:	16.40	8.79	10.50	2.36	6.71	8.42
0.28								
Aug		:	15.20	7.45	9.30	2.36	5.37	7.22
0.28								

Oranges: Average Prices and Equivalent Returns, Florida
November 1995 - June 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
FL		All Oranges					
Nov 1995	14.50	5.54	7.50	5.32	3.49	5.45	3.27
Dec	13.50	5.54	6.50	5.48	3.49	4.45	3.43
Jan 1996	13.50	5.77	6.50	5.75	3.72	4.45	3.70
Feb	14.20	6.01	7.24	5.95	3.95	5.19	3.89
Mar	14.20	7.28	7.20	7.28	5.18	5.15	5.18
Apr	15.00	7.58	8.00	7.57	5.48	5.95	5.47
May	15.20	7.88	8.20	7.87	5.78	6.15	5.77
Jun	20.00	8.46	13.00	8.17	6.36	10.95	6.07
Nov	15.20	5.28	8.20	4.76	3.38	6.30	2.86
Dec	12.40	5.02	5.40	5.00	3.12	3.50	3.10
Jan 1997	11.20	5.07	4.20	5.09	3.17	2.30	3.19
Feb	13.10	5.09	6.11	5.06	3.18	4.21	3.15
Mar	13.10	5.95	6.10	5.94	4.00	4.20	3.99
Apr	12.30	6.09	5.30	6.12	4.15	3.40	4.17
May	13.10	6.06	6.10	6.06	4.11	4.20	4.11
Jun	18.20	6.16	11.20	5.97	4.21	9.30	4.02
Oct	14.50	4.22	7.40	2.50	2.42	5.50	0.75

Nov		12.40	3.49	5.30	3.37	1.73	3.40	1.62
Dec		12.20	4.04	5.10	3.96	2.28	3.20	2.21
Jan	1998	11.40	4.38	4.30	4.38	2.62	2.40	2.63
Feb		11.70	5.13	4.55	5.14	3.36	2.65	3.38
Mar		13.00	6.58	5.90	6.60	4.73	4.00	4.75
Apr		12.60	6.96	5.50	7.00	5.10	3.60	5.15
May		13.20	7.26	6.10	7.30	5.41	4.20	5.45
Jun		16.00	7.85	8.90	7.80	6.00	7.00	5.95
FL				Early and Midseason				
Nov	1995	14.50	5.54	7.50	5.32	3.49	5.45	3.27
Dec		13.50	5.54	6.50	5.48	3.49	4.45	3.43
Jan	1996	13.50	5.77	6.50	5.75	3.72	4.45	3.70
Feb		13.50	5.97	6.50	5.95	3.92	4.45	3.90
Nov		15.20	5.28	8.20	4.76	3.38	6.30	2.86
Dec		12.40	5.02	5.40	5.00	3.12	3.50	3.10
Jan	1997	11.20	5.07	4.20	5.09	3.17	2.30	3.19
Feb		12.50	5.07	5.50	5.06	3.17	3.60	3.16
Oct		14.50	4.22	7.40	2.50	2.42	5.50	0.75
Nov		12.40	3.49	5.30	3.37	1.73	3.40	1.62
Dec		12.20	4.04	5.10	3.96	2.28	3.20	2.21
Jan	1998	11.40	4.38	4.30	4.38	2.62	2.40	2.63
Feb		11.10	4.97	4.00	4.99	3.22	2.10	3.24
FL				Valencias				
Feb	1996	15.00	6.26	8.00	5.96	4.16	5.95	3.86
Mar		14.20	7.28	7.20	7.28	5.18	5.15	5.18

Apr		15.00	7.58	8.00	7.57	5.48	5.95
5.47							
May		15.20	7.88	8.20	7.87	5.78	6.15
5.77							
Jun		20.00	8.46	13.00	8.17	6.36	10.95
6.07							
Feb	1997	13.80	5.19	6.80	5.07	3.24	4.90
3.12							
Mar		13.10	5.95	6.10	5.94	4.00	4.20
3.99							
Apr		12.30	6.09	5.30	6.12	4.15	3.40
4.17							
May		13.10	6.06	6.10	6.06	4.11	4.20
4.11							
Jun		18.20	6.16	11.20	5.97	4.21	9.30
4.02							
Feb	1998	12.20	6.09	5.10	6.20	4.24	3.20
4.35							
Mar		13.00	6.58	5.90	6.60	4.73	4.00
4.75							
Apr		12.60	6.96	5.50	7.00	5.10	3.60
5.15							
May		13.20	7.26	6.10	7.30	5.41	4.20
5.45							
Jun		16.00	7.85	8.90	7.80	6.00	7.00
5.95							

Oranges: Average Prices and Equivalent Returns, Texas
October 1995 - May 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
TX	All Oranges						
Oct 1995	21.00	12.36	13.40	2.83	11.21	12.25	1.73
Nov	16.50	7.99	8.90	2.83	6.85	7.75	1.73

Dec		:	15.40	6.89	7.80	3.03	5.75	6.65
1.93								
Jan	1996	:	13.50	5.30	5.90	3.01	4.16	4.75
1.91								
Feb		:	14.70	6.32	7.12	2.89	5.18	5.97
1.79								
Mar		:	16.10	8.00	8.45	3.10	6.85	7.30
2.00								
Apr		:	17.00	8.95	9.40	3.10	7.80	8.25
200								
May		:	17.00	8.61	9.40	3.10	7.47	8.25
2.00								
		:						
Oct		:	19.60	9.70	10.80	3.31	8.41	9.50
2.06								
Nov		:	15.00	5.47	6.20	3.17	4.19	4.90
1.92								
Dec		:	12.40	3.26	3.60	3.10	2.00	2.30
1.85								
Jan	1997	:	12.40	3.39	3.60	3.10	2.12	2.30
1.85								
Feb		:	14.30	5.22	5.54	3.75	3.93	4.24
2.50								
Mar		:	15.00	6.04	6.19	4.35	4.74	4.89
3.10								
Apr		:	15.50	6.24	6.70	4.42	4.95	5.40
3.17								
May		:	15.50	5.94	6.70	4.42	4.66	5.40
3.17								
		:						
Oct		:	18.10	8.47	9.30	2.29	7.18	8.00
1.04								
Nov		:	13.70	4.34	4.90	2.29	3.05	3.60
1.04								
Dec		:	12.50	3.16	3.70	2.04	1.88	2.40
0.79								
Jan	1998	:	11.50	2.46	2.70	2.04	1.18	1.40
0.79								
Feb		:	11.30	2.95	2.54	4.59	1.66	1.24
3.34								
Mar		:	13.90	5.16	5.11	5.42	3.86	3.81
4.17								
Apr		:	13.10	4.18	4.30	3.80	2.89	3.00
2.55								
May		:	13.10	4.30	4.30		3.00	3.00
		:						
TX		:			Early and Midseason			
		:						
Oct	1995	:	21.00	12.36	13.40	2.83	11.21	12.25
1.73								
Nov		:	16.50	7.99	8.90	2.83	6.85	7.75
1.73								
Dec		:	15.40	6.89	7.80	3.03	5.75	6.65
1.93								

Jan	1996	:	13.50	5.30	5.90	3.01	4.16	4.75
1.91								
Feb		:	13.60	5.20	6.00	2.89	4.06	4.85
1.79								
Mar		:	13.60	6.00	6.00		4.85	4.85
		:						
Oct	1996	:	19.60	9.70	10.80	3.31	8.41	9.50
2.06								
Nov		:	15.00	5.47	6.20	3.17	4.19	4.90
1.92								
Dec		:	12.40	3.26	3.60	3.10	2.00	2.30
1.85								
Jan	1997	:	12.40	3.39	3.60	3.10	2.12	2.30
1.85								
Feb		:	12.40	3.52	3.60	3.10	2.23	2.30
1.85								
Mar		:	12.40	3.60	3.60		2.30	2.30
		:						
Oct		:	18.10	8.47	9.30	2.29	7.18	8.00
1.04								
Nov		:	13.70	4.34	4.90	2.29	3.05	3.60
1.04								
Dec		:	12.50	3.16	3.70	2.04	1.88	2.40
0.79								
Jan	1998	:	11.50	2.46	2.70	2.04	1.18	1.40
0.79								
Feb		:	11.10	2.78	2.30	4.59	1.49	1.00
3.34								
Mar		:	11.10	2.63	2.30	4.59	1.33	1.00
3.34								
		:						
TX		:				Valencias		
		:						
Feb	1996	:	17.00	9.40	9.40		8.25	8.25
Mar		:	17.00	8.68	9.40	3.10	7.54	8.25
2.00								
Apr		:	17.00	8.95	9.40	3.10	7.80	8.25
2.00								
May		:	17.00	8.61	9.40	3.10	7.47	8.25
2.00								
		:						
Feb	1997	:	16.90	7.31	8.10	4.35	6.02	6.80
3.10								
Mar		:	17.00	7.67	8.20	4.35	6.37	6.90
3.10								
Apr		:	15.50	6.24	6.70	4.42	4.95	5.40
3.17								
May		:	15.50	5.94	6.70	4.42	4.66	5.40
3.17								
		:						
Feb	1998	:	15.50	6.70	6.70		5.40	5.40
Mar		:	15.50	6.56	6.70	5.84	5.27	5.40
4.59								

Apr	: 13.10	4.18	4.30	3.80	2.89	3.00	2.55
May	: 13.10	4.30	4.30		3.00	3.00	

Grapefruit: Average Prices and Equivalent Returns, United States
September 1995 - August 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
US	All Grapefruit						
Sep 1995	15.10	6.57	9.63	-0.44	4.63	7.69	-2.38
Oct	16.20	7.22	8.64	1.95	5.34	6.85	-0.27
Nov	13.20	4.48	5.65	1.87	2.55	3.86	-0.39
Dec	12.20	3.76	4.65	2.50	1.85	2.93	0.33
Jan 1996	12.60	3.88	5.06	2.69	1.87	3.28	0.46
Feb	12.90	3.81	5.25	2.88	1.76	3.44	0.67
Mar	12.90	3.70	5.29	2.92	1.60	3.47	0.69
Apr	13.70	4.11	6.27	2.71	2.08	4.50	0.51
May	14.00	5.16	7.63	1.46	3.24	5.81	-0.61
Jun	13.50	6.18	8.08	-0.39	4.24	6.14	-2.33
Jul	11.70	4.76	6.29	-0.44	2.82	4.35	-2.38
Aug	16.70	6.22	11.26	-0.44	4.28	9.32	-2.38
Sep	19.50	10.01	14.09	-0.34	8.07	12.15	-2.28
Oct	16.70	7.63	9.37	0.56	5.72	7.59	-1.89
Nov	14.10	4.86	6.15	1.87	3.01	4.44	-0.34

Dec		13.10	4.14	5.33	2.25	2.10	3.52
-0.15							
Jan	1997	13.50	4.12	5.56	2.29	2.10	3.77
-0.03							
Feb		12.90	3.67	5.05	2.43	1.62	3.26
0.14							
Mar		13.50	3.31	5.59	2.41	1.16	3.79
0.12							
Apr		12.90	3.19	5.20	2.30	1.02	3.38
-0.03							
May		11.90	2.92	4.61	2.06	0.77	2.77
-0.25							
Jun		13.30	4.97	7.13	1.09	2.95	5.22
-1.12							
Jul		14.60	8.63	9.19	-0.44	6.69	7.25
-2.38							
Aug		14.40	5.98	8.96	-0.44	4.04	7.02
-2.38							
Sep		14.90	6.16	9.46	-0.44	4.22	7.52
-2.38							
Oct		14.30	5.17	6.46	0.16	3.23	4.65
-2.30							
Nov		13.20	3.85	5.33	0.75	1.84	3.56
-1.75							
Dec		13.60	3.93	5.67	0.80	1.94	3.92
-1.64							
Jan	1998	13.00	3.12	5.13	0.74	1.01	3.34
-1.75							
Feb		13.40	2.98	5.47	1.29	0.77	3.68
-1.19							
Mar		13.00	2.66	5.10	1.49	0.41	3.30
-0.97							
Apr		12.90	2.64	5.10	1.36	0.40	3.31
-1.11							
May		13.10	2.83	6.00	1.16	0.59	4.16
-1.28							
Jun		16.10	6.14	10.64	-0.26	4.20	8.70
-2.20							
Jul		16.90	7.89	11.50	-0.26	5.95	9.56
-2.20							
Aug		17.40	7.95	11.96	-0.26	6.01	10.02
-2.20							

Grapefruit: Average Prices and Equivalent Returns, Arizona
September 1995 - July 1998

State, Month,	Equiv. P.H.D.	Equiv. On-Tree

and Year		F.O.B. Packed	All	Fresh	Proc.	All	Fresh	Proc.
			Dollars per box					
AZ			All Grapefruit					
Sep	1995	20.80	15.36	15.36		13.42	13.42	
Oct		13.80	8.36	8.36		6.42	6.42	
Nov		11.40	5.66	5.96	-0.28	3.72	4.02	-2.22
Dec		11.70	5.79	6.26	-0.28	3.85	4.32	-2.22
Jan	1996	10.80	5.08	5.36	-0.28	3.14	3.42	-2.22
Feb		11.20	5.30	5.76	-0.28	3.35	3.82	-2.22
Mar		11.20	3.33	5.76	-0.28	1.39	3.82	-2.22
Apr		11.20	3.46	5.76	-0.28	1.52	3.82	-2.22
May		11.90	3.26	6.46	-0.28	1.32	4.52	-2.22
Jun		14.40	4.85	8.96	-0.28	2.91	7.02	-2.22
Jul		4.18	-1.19	-1.26	-0.28	-3.13	-3.20	-2.22
Sep		21.00	15.56	15.56		13.62	13.62	
Oct		15.80	9.48	10.36	-0.26	7.53	8.42	-2.20
Nov		15.20	8.50	9.76	-0.26	6.56	7.82	-2.20
Dec		12.50	7.06	7.06		5.12	5.12	
Jan	1997	10.30	4.48	4.86	-0.26	2.54	2.92	-2.20
Feb		11.10	5.36	5.66	-0.42	3.42	3.72	-2.36
Mar		9.88	4.25	4.44	-0.44	2.30	2.50	-2.38
Apr		11.30	3.36	5.86	-0.44	1.42	3.92	-2.38
May		11.50	2.50	6.06	-0.42	0.56	4.12	-2.36
Jun		11.20	2.22	5.76	-0.42	0.28	3.82	-2.36
Jul		9.80	3.32	4.36	-0.38	1.38	2.42	-2.32
Nov		9.10	3.66	3.66		1.72	1.72	
Dec		10.20	3.28	4.76	-0.26	1.34	2.82	-2.20

Jan	1998	10.00	4.10	4.56	-0.26	2.16	2.62	-2.20
Feb		11.20	5.16	5.76	-0.26	3.22	3.82	-2.20
Mar		11.30	4.07	5.86	-0.26	2.13	3.92	-2.20
Apr		11.70	4.48	6.26	-0.26	2.54	4.32	-2.20
May		13.30	4.76	7.86	-0.26	2.82	5.92	-2.20
Jun		15.20	5.11	9.76	-0.26	3.17	7.82	-2.20
Jul		14.90	4.30	9.46	-0.26	2.36	7.52	-2.20

Grapefruit: Average Prices and Equivalent Returns, California
September 1995 - August 1998

State, Month, and Year		F.O.B. Packed	Equiv. P.H.D. All	Fresh	Proc.	Equiv. On-Tree All	Fresh	Proc.
			Dollars per box					
CA			All Grapefruit					
Sep	1995	15.00	6.50	9.56	-0.44	4.56	7.62	-2.38
Oct		17.40	10.15	11.96	-0.44	8.21	10.02	-2.38
Nov		14.50	7.04	9.06	-0.44	5.10	7.12	-2.38
Dec		10.70	4.94	5.26	-0.44	3.00	3.32	-2.38
Jan	1996	11.30	4.74	5.86	-0.44	2.80	3.92	-2.38
Feb		11.10	4.63	5.66	-0.44	2.69	3.72	-2.38
Mar		11.50	4.25	6.06	-0.44	2.31	4.12	-2.38
Apr		12.30	4.34	6.86	-0.44	2.40	4.92	-2.38
May		15.20	7.26	9.76	-0.44	5.32	7.82	-2.38

Jun		13.40	6.44	7.96	-0.44	4.50	6.02	-2.38
Jul		12.10	5.00	6.66	-0.44	3.06	4.72	-2.38
Aug		16.70	6.22	11.26	-0.44	4.28	9.32	-2.38
Sep		19.50	9.93	14.06	-0.34	7.99	12.12	-2.28
Oct		22.40	14.05	16.96	-0.15	12.11	15.02	-2.09
Nov		15.20	4.36	9.76	-0.26	2.42	7.82	-2.20
Dec		13.00	5.61	7.56	-0.26	3.67	5.62	-2.20
Jan	1997	12.00	4.51	6.56	-0			

State, Month, and Year	F.O.B. Packed	All	Fresh	Proc.	All	Fresh	Proc.
	Dollars per box						
CA	All Grapefruit						
Sep 1995	15.00	6.50	9.56	-0.44	4.56	7.62	-2.38
Oct	17.40	10.15	11.96	-0.44	8.21	10.02	-2.38
Nov	14.50	7.04	9.06	-0.44	5.10	7.12	-2.38
Dec	10.70	4.94	5.26	-0.44	3.00	3.32	-2.38
Jan 1996	11.30	4.74	5.86	-0.44	2.80	3.92	-2.38
Feb	11.10	4.63	5.66	-0.44	2.69	3.72	-2.38
Mar	11.50	4.25	6.06	-0.44	2.31	4.12	-2.38
Apr	12.30	4.34	6.86	-0.44	2.40	4.92	-2.38
May	15.20	7.26	9.76	-0.44	5.32	7.82	-2.38
Jun	13.40	6.44	7.96	-0.44	4.50	6.02	-2.38
Jul	12.10	5.00	6.66	-0.44	3.06	4.72	-2.38
Aug	16.70	6.22	11.26	-0.44	4.28	9.32	-2.38
Sep	19.50	9.93	14.06	-0.34	7.99	12.12	-2.28

Oct		:	22.40	14.05	16.96	-0.15	12.11	15.02
-2.09								
Nov		:	15.20	4.36	9.76	-0.26	2.42	7.82
-2.20								
Dec		:	13.00	5.61	7.56	-0.26	3.67	5.62
-2.20								
Jan	1997	:	12.00	4.51	6.56	-0.26	2.57	4.62
-2.20								
Feb		:	11.20	3.89	5.76	-0.16	1.95	3.82
-2.10								
Mar		:	10.90	3.20	5.46	-0.38	1.26	3.52
-2.32								
Apr		:	12.20	4.04	6.76	-0.44	2.10	4.82
-2.38								
May		:	12.90	3.90	7.46	-0.42	1.96	5.52
-2.36								
Jun		:	14.60	6.65	9.16	-0.44	4.71	7.22
-2.38								
Jul		:	14.70	8.73	9.26	-0.44	6.79	7.32
-2.38								
Aug		:	14.40	5.98	8.96	-0.44	4.04	7.02
-2.38								
Sep		:	14.90	6.16	9.46	-0.44	4.22	7.52
-2.38								
Oct		:	10.50	2.54	5.06	-0.44	0.60	3.12
-2.38								
Nov		:	8.80	2.52	3.36	-0.27	0.58	1.42
-2.21								
Dec		:	10.80	3.86	5.36	-0.26	1.92	3.42
-2.20								
Jan	1998	:	10.60	3.81	5.16	-0.26	1.87	3.22
-2.20								
Feb		:	11.40	3.75	5.96	-0.26	1.81	4.02
-2.20								
Mar		:	11.30	3.54	5.86	-0.26	1.60	3.92
-2.20								
Apr		:	12.10	3.69	6.66	-0.26	1.75	4.72
-2.20								
May		:	15.20	5.19	9.76	-0.26	3.25	7.82
-2.20								
Jun		:	16.40	6.58	10.96	-0.26	4.64	9.02
-2.20								
Jul		:	17.00	8.05	11.56	-0.26	6.11	9.62
-2.20								
Aug		:	17.40	7.95	11.96	-0.26	6.01	10.02
-2.20								

Grapefruit: Average Prices and Equivalent Returns, Florida
October 1995 - May 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
FL	All Grapefruit						
Oct 1995	15.80	6.75	8.11	2.01	4.78	6.24	-0.31
Nov	12.90	4.21	5.29	1.92	2.20	3.43	-0.43
Dec	11.90	3.55	4.31	2.59	1.49	2.45	0.28
Jan 1996	12.60	3.78	4.91	2.76	1.69	3.04	0.47
Feb	13.10	3.80	5.26	2.94	1.68	3.39	0.68
Mar	13.10	3.70	5.29	3.01	1.56	3.41	0.74
Apr	14.30	4.21	6.54	2.94	2.07	4.67	0.64
May	13.60	4.41	6.11	2.72	2.29	4.26	0.33
. . .							
Oct	16.20	7.24	8.62	2.04	5.24	6.76	-0.50
Nov	13.90	4.82	6.07	2.04	2.76	4.20	-0.42
Dec	13.00	4.06	5.25	2.31	1.95	3.38	-0.14
Jan 1997	13.50	4.13	5.63	2.38	2.01	3.75	-0.02
Feb	13.00	3.70	5.17	2.51	1.55	3.29	0.15
Mar	13.70	3.32	5.77	246	1.10	3.88	0.13
Apr	12.90	3.15	5.11	2.38	0.93	3.24	0.02
May	11.50	2.81	3.79	2.40	0.56	1.92	-0.01
Jun	11.60	3.57	4.02	2.94	1.42	2.16	0.40
Oct	14.30	5.27	6.44	0.25	3.26	4.57	-2.39
Nov	13.10	3.66	5.23	0.74	1.53	3.36	-1.88

Dec		:	13.50	3.77	5.65	0.75	1.61	3.77
-1.85								
Jan	1998	:	13.00	2.98	5.15	0.72	0.77	3.27
-1.85								
Feb		:	13.30	2.79	5.35	1.31	0.49	3.46
-1.24								
Mar		:	13.00	2.55	5.01	1.52	0.22	3.13
-1.00								
Apr		:	12.80	2.48	4.86	1.40	0.14	2.99
-1.14								
May		:	12.00	2.16	4.16	1.38	-0.21	2.29
-1.18								
		:						
FL		:			White Seedless			
		:						
Oct	1995	:	16.80	6.27	8.40	2.25	4.24	6.48
0.00								
Nov		:	16.00	5.11	7.60	2.25	3.04	5.68
0.00								
Dec		:	15.00	4.17	6.60	3.04	2.02	4.68
0.79								
Jan	1996	:	16.20	4.58	7.80	3.17	2.43	5.88
0.92								
Feb		:	16.50	4.35	8.10	3.18	2.17	6.18
0.93								
Mar		:	16.20	4.01	7.80	3.16	1.82	5.88
0.91								
Apr		:	16.10	4.04	7.70	3.17	1.86	5.78
0.92								
		:						
Nov		:	17.90	6.69	9.46	1.85	4.64	7.53
-0.43								
Dec		:	15.60	4.29	7.16	2.07	2.17	5.23
-0.21								
Jan	1997	:	15.30	3.99	6.86	2.04	1.85	4.93
-0.24								
Feb		:	14.50	3.49	6.06	2.29	1.32	4.13
0.01								
Mar		:	15.60	3.06	7.16	2.29	0.83	5.23
0.01								
Apr		:	16.50	2.95	8.06	2.05	0.72	6.13
-0.23								
May		:	11.00	2.16	2.56	2.12	-0.09	0.63
-0.16								
		:						
Oct		:	17.20	6.86	8.61	0.25	4.82	6.68
-2.21								
Nov		:	15.00	3.62	6.41	0.70	1.44	4.48
-1.76								
Dec		:	16.80	4.49	8.21	1.10	2.28	6.28
-1.36								
Jan	1998	:	16.50	3.19	7.91	0.60	0.92	5.98
-1.86								

Feb	: 16.10	3.00	7.51	1.25	0.69	5.58	-1.21
Mar	: 15.70	2.58	7.11	1.45	0.23	5.18	-1.01
Apr	: 15.50	2.33	6.91	1.30	-0.03	4.98	-1.16
May	: 12.50	1.48	3.91	1.20	-0.93	1.98	-1.26

Grapefruit: Average Prices and Equivalent Returns, Florida
October 1995 - May 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
FL	Colored Seedless						
Oct 1995	15.50	6.95	8.01	1.81	5.01	6.16	-0.58
Nov	12.40	4.02	4.91	1.81	2.01	3.06	-0.58
Dec	11.40	3.34	3.91	2.27	1.30	2.06	-0.12
Jan 1996	11.40	3.23	3.91	2.19	1.17	2.06	-0.20
Feb	11.30	3.16	3.81	2.31	1.07	1.96	-0.08
Mar	11.40	3.25	3.91	2.56	1.14	2.06	0.17
Apr	13.60	4.39	6.11	2.53	2.28	4.26	0.14
May	13.60	4.41	6.11	2.72	2.29	4.26	0.33
Oct	16.20	7.24	8.62	2.04	5.24	6.76	-0.50
Nov	12.50	4.10	4.92	2.13	2.05	3.06	-0.41
Dec	12.50	4.03	4.92	2.44	1.93	3.06	-0.10
Jan 1997	12.70	4.24	5.12	2.75	2.13	3.26	0.21

Feb		12.30	3.96	4.72	2.90	1.82	2.86	0.36
Mar		12.50	3.83	4.92	2.95	1.59	3.06	0.41
Apr		11.70	3.42	4.12	2.89	1.17	2.26	0.35
May		11.50	3.17	3.92	2.66	0.91	2.06	0.12
Jun		11.60	3.57	4.02	2.94	1.42	2.16	0.40
Oct		13.80	5.02	6.11	0.25	3.01	4.25	-2.42
Nov		12.70	3.66	5.01	0.75	1.55	3.15	-1.92
Dec		12.80	3.56	5.11	0.60	1.42	3.25	-2.07
Jan	1998	12.00	2.89	4.31	0.80	0.71	2.45	-1.87
Feb		12.00	2.67	4.31	1.35	0.36	2.45	-1.32
Mar		11.70	2.57	4.01	1.60	0.23	2.15	-1.07
Apr		11.90	2.61	4.21	1.50	0.28	2.35	-1.17
May		11.90	2.70	4.21	1.60	0.37	2.35	-1.07
FL				Other Than Seedless				
Dec	1995		2.80		2.80	1.10		1.10
Jan	1996		3.50		3.50	1.80		1.80
Feb			3.50		3.50	1.80		1.80
Mar			3.40		3.40	1.70		1.70
Apr			3.50		3.50	1.80		1.80
Dec			1.20		1.20	-0.60		-0.60
Jan	1997		1.50		1.50	-0.30		-0.30
Feb			1.90		1.90	0.10		0.10
Mar			2.10		2.10	0.30		0.30
Apr			2.10		2.10	0.30		0.30
May			1.50		1.50	-0.30		-0.30

Jan	1998	1.00	1.00	-0.80		-0.80
Feb		1.50	1.50	-0.30		-0.30
Mar		1.60	1.60	-0.20		-0.20
Apr		1.50	1.50	-0.30		-0.30

Grapefruit: Average Prices and Equivalent Returns, Texas
October 1995 - May 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
TX	All Grapefruit						
Oct	1995 19.80	10.80	12.32	1.80	9.80	11.32	0.85
Nov	15.50	6.60	8.02	1.80	5.62	7.02	0.85
Dec	13.60	4.81	6.12	1.80	3.82	5.12	0.85
Jan	1996 13.50	4.73	6.02	1.76	3.75	5.02	0.81
Feb	12.30	3.63	4.82	1.76	2.65	3.82	0.81
Mar	12.10	3.30	4.62	1.40	2.32	3.62	0.45
Apr	11.80	3.12	4.32	1.40	2.14	3.32	0.45
May	11.80	3.04	4.32	1.40	2.07	3.32	0.45
Oct	16.60	6.99	7.90	1.50	5.85	6.75	0.40
Nov	14.90	5.06	6.20	1.50	3.92	5.05	0.40
Dec	14.10	4.66	5.40	1.50	3.52	4.25	0.40
Jan	1997 13.60	3.99	4.90	1.50	2.85	3.75	0.40

Feb		12.80	3.29	4.10	1.50	2.15	2.95
0.40							
Mar		13.10	3.29	4.40	1.50	2.16	3.25
0.40							
Apr		13.20	3.30	4.50	1.50	2.17	3.35
0.40							
May		13.20	2.89	4.50	1.50	1.77	3.35
0.40							
Oct		16.30	7.06	7.60	1.50	5.92	6.45
0.40							
Nov		15.40	5.81	6.70	1.50	4.67	5.55
0.40							
Dec		14.50	4.83	5.80	1.50	3.69	4.65
0.40							
Jan	1998	13.70	4.19	5.00	1.50	3.05	3.85
0.40							
Feb		14.70	4.69	6.00	1.50	3.56	4.85
0.40							
Mar		14.10	3.93	5.40	1.50	2.80	4.25
0.40							
Apr		14.60	4.26	5.90	1.50	3.13	4.75
0.40							
May		14.60	4.01	5.90	1.50	2.88	4.75
0.40							

Lemons: Average Prices and Equivalent Returns, United States
August 1995 - July 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
US		All Lemons					
Aug 1995	43.30	22.82	34.87	1.88	19.18	31.23	-1.76
Sep	39.30	21.15	30.84	1.88	17.51	27.20	-1.76
Oct	30.70	14.18	22.25	1.88	10.54	18.61	-1.76
Nov	23.00	9.48	14.60	1.88	5.84	10.96	-1.76

Dec		:	19.90	7.03	11.45	1.88	3.39	7.81
-1.76								
Jan	1996	:	18.70	5.52	10.29	1.88	1.88	6.65
-1.76								
Feb		:	17.80	5.08	9.38	1.88	1.44	5.74
-1.76								
Mar		:	19.30	5.92	10.87	1.88	2.28	7.23
-1.76								
Apr		:	23.40	8.44	14.92	1.88	4.80	11.28
-1.76								
May		:	28.10	10.73	19.66	1.88	7.09	16.02
-1.76								
Jun		:	35.10	15.04	26.66	1.88	11.40	23.02
-1.76								
Jul		:	40.10	17.16	31.66	1.88	13.52	28.02
-1.76								
		:						
Aug		:	37.60	18.88	29.16	3.02	15.24	25.52
-0.62								
Sep		:	35.20	18.01	26.73	3.02	14.37	23.09
-0.62								
Oct		:	30.40	13.97	21.93	3.02	10.33	18.29
-0.62								
Nov		:	27.80	11.79	19.40	3.02	8.15	15.76
-0.62								
Dec		:	25.10	10.09	16.62	3.02	6.45	12.98
-0.62								
Jan	1997	:	22.30	7.94	13.89	3.02	4.30	10.25
-0.62								
Feb		:	19.50	5.50	11.03	3.02	1.86	7.39
-0.62								
Mar		:	19.00	5.61	10.54	3.02	1.97	6.90
-0.62								
Apr		:	22.30	8.92	13.86	3.02	5.28	10.22
-0.62								
May		:	31.80	18.98	23.36	3.02	15.34	19.72
-0.62								
Jun		:	41.90	28.78	33.46	3.02	25.14	29.82
-0.62								
Jul		:	48.20	33.08	39.76	3.02	29.44	36.12
-0.62								
		:						
Aug		:	49.70	27.69	41.26	3.02	24.05	37.62
-0.62								
Sep		:	46.20	24.28	37.81	3.02	20.64	34.17
-0.62								
Oct		:	32.00	14.98	23.51	3.02	11.34	19.87
-0.62								
Nov		:	21.30	7.91	12.88	2.08	4.27	9.24
-1.56								
Dec		:	19.00	6.24	10.53	2.08	2.60	6.89
-1.56								
Jan	1998	:	17.90	5.41	9.48	2.08	1.77	5.84
-1.56								

Feb	:	17.30	5.07	8.85	2.08	1.43	5.21
-1.56							
Mar	:	19.50	5.27	11.01	2.08	1.63	7.37
-1.56							
Apr	:	22.50	6.26	14.03	2.08	2.62	10.39
-1.56							
May	:	27.90	10.42	19.46	2.08	6.78	15.82
-1.56							
Jun	:	37.60	19.55	29.16	2.08	15.91	25.52
-1.56							
Jul	:	43.90	26.51	35.46	2.08	22.87	31.82
-1.56							

Lemons: Average Prices and Equivalent Returns, Arizona and California
August 1995 - July 1998

State, Month, and Year		F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
		Dollars per box						
AZ		All Lemons						
Aug	1995	44.30	29.06	35.86	1.88	25.42	32.22	
-1.76								
Sep		39.70	27.23	31.26	1.88	23.59	27.62	
-1.76								
Oct		28.90	15.71	20.46	1.88	12.07	16.82	
-1.76								
Nov		20.90	9.13	12.46	1.88	5.49	8.82	
-1.76								
Dec		18.90	6.76	10.46	1.88	3.12	6.82	
-1.76								
Jan	1996	17.60	5.14	9.16	1.88	1.50	5.52	
-1.76								
Feb		16.90	4.29	8.46	1.88	0.65	4.82	
-1.76								
Mar		16.90	3.82	8.46	1.88	0.18	4.82	
-1.76								
Apr		18.60	3.76	10.16	1.88	0.12	6.52	
-1.76								
Sep		33.80	19.44	25.36	3.02	15.80	21.72	
-0.62								

Oct		:	29.90	16.55	21.46	3.02	12.91	17.82
-0.62								
Nov		:	25.50	11.63	17.06	3.02	7.99	13.42
-0.62								
Dec		:	23.40	9.42	14.96	3.02	5.78	11.32
-0.62								
Jan	1997	:	21.50	7.80	13.06	3.02	4.16	9.42
-0.62								
Feb		:	17.90	6.10	9.46	3.02	2.46	5.82
-0.62								
Mar		:	15.90	5.07	7.46	3.02	1.43	3.82
-0.62								
		:						
Sep		:	51.70	40.84	43.26	3.02	37.20	39.62
-0.62								
Oct		:	31.60	17.49	23.16	3.02	13.85	19.52
-0.62								
Nov		:	20.00	7.60	11.56	2.08	3.96	7.92
-1.56								
Dec		:	17.90	5.88	9.46	2.08	2.24	5.82
-1.56								
Jan	1998	:	17.20	5.19	8.76	2.08	1.55	5.12
-1.56								
Feb		:	15.80	4.39	7.36	2.08	0.75	3.72
-1.56								
Mar		:	17.10	4.39	8.66	2.08	0.75	5.02
-1.56								
Apr		:	19.00	3.75	10.56	2.08	0.11	6.92
-1.56								
		:						
CA		:			All Lemons			
		:						
Aug	1995	:	43.30	22.77	34.86	1.88	19.13	31.22
-1.76								
Sep		:	39.10	19.29	30.66	1.88	15.65	27.02
-1.76								
Oct		:	31.50	13.67	23.06	1.88	10.03	19.42
-1.76								
Nov		:	24.00	9.61	15.56	1.88	5.97	11.92
-1.76								
Dec		:	20.60	7.20	12.16	1.88	3.56	8.52
-1.76								
Jan	1996	:	19.40	5.74	10.96	1.88	2.10	7.32
-1.76								
Feb		:	18.20	5.49	9.76	1.88	1.85	6.12
-1.76								
Mar		:	19.60	6.33	11.16	1.88	2.69	7.52
-1.76								
Apr		:	23.40	8.52	14.96	1.88	4.88	11.32
-1.76								
May		:	28.10	10.73	19.66	1.88	7.09	16.02
-1.76								
Jun		:	35.10	15.04	26.66	1.88	11.40	23.02
-1.76								

Jul		:	40.10	17.16	31.66	1.88	13.52	28.02
-1.76								
		:						
Aug		:	37.60	18.88	29.16	3.02	15.24	25.52
-0.62								
Sep		:	35.40	17.80	26.96	3.02	14.16	23.32
-0.62								
Oct		:	30.50	13.45	22.06	3.02	9.81	18.42
-0.62								
Nov		:	28.40	11.82	19.96	3.02	8.18	16.32
-0.62								
Dec		:	25.80	10.38	17.36	3.02	6.74	13.72
-0.62								
Jan	1997	:	22.60	7.98	14.16	3.02	4.34	10.52
-0.62								
Feb		:	19.60	5.47	11.16	3.02	1.83	7.52
-0.62								
Mar		:	19.00	5.62	10.56	3.02	1.98	6.92
-0.62								
Apr		:	22.30	8.92	13.86	3.02	5.28	10.22
-0.62								
May		:	31.80	18.98	23.36	3.02	15.34	19.72
-0.62								
Jun		:	41.90	28.78	33.46	3.02	25.14	29.82
-0.62								
Jul		:	48.20	33.08	39.76	3.02	29.44	36.12
-0.62								
		:						
Aug		:	49.70	27.69	41.26	3.02	24.05	37.62
-0.62								
Sep		:	45.10	22.17	36.66	3.02	18.53	33.02
-0.62								
Oct		:	32.10	14.19	23.66	3.02	10.55	20.02
-0.62								
Nov		:	21.90	8.04	13.46	2.08	4.40	9.82
-1.56								
Dec		:	19.40	6.38	10.96	2.08	2.74	7.32
-1.56								
Jan	1998	:	18.10	5.47	9.66	2.08	1.83	6.02
-1.56								
Feb		:	17.50	5.16	9.06	2.08	1.52	5.42
-1.56								
Mar		:	19.50	5.29	11.06	2.08	1.65	7.42
-1.56								
Apr		:	22.50	6.30	14.06	2.08	2.66	10.42
-1.56								
May		:	27.90	10.42	19.46	2.08	6.78	15.82
-1.56								
Jun		:	37.60	19.55	29.16	2.08	15.91	25.52
-1.56								
Jul		:	43.90	26.51	35.46	2.08	22.87	31.82
-1.56								

Tangerines: Average Prices and Equivalent Returns, Arizona and United States, October 1995 - June 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
US			Tangerines				
Oct 1995	27.30	16.22	19.48	4.55	13.17	16.58	0.95
Nov	27.30	16.07	19.49	4.22	13.05	16.59	0.78
Dec	24.20	13.98	16.60	4.23	11.05	13.78	0.87
Jan 1996	26.80	14.03	19.52	4.02	11.19	16.87	0.85
Feb	24.30	11.85	17.09	2.54	9.20	14.46	-0.13
Mar	25.40	11.74	18.16	2.13	9.11	15.49	-0.44
Apr	27.90	14.09	20.74	2.82	11.43	18.11	0.11
May	16.50	6.82	10.63	-0.32	4.74	8.55	-2.40
. . .							
Oct	25.10	13.48	16.96	3.57	10.36	13.95	0.12
Nov	24.00	12.39	16.38	3.81	9.41	13.57	0.47
Dec	21.70	10.62	13.76	4.21	7.53	10.84	0.78
Jan 1997	25.60	12.52	18.14	3.92	9.49	15.38	0.47
Feb	26.00	12.65	18.91	3.36	9.79	16.33	0.07
Mar	24.30	13.14	17.24	4.02	10.36	14.66	0.79
Apr	28.80	16.42	21.15	4.08	13.43	18.35	0.62
May	29.20	14.76	21.30	4.00	11.57	18.37	0.40

Sep		:	23.30	13.47	14.70	3.46	10.23	11.50
-0.14								
Oct		:	24.20	11.75	16.04	2.91	8.63	13.02
-0.44								
Nov		:	23.10	11.24	15.09	2.93	8.15	12.12
-0.41								
Dec		:	23.00	10.75	15.35	2.47	7.85	12.56
-0.63								
Jan	1998	:	26.50	12.87	19.09	2.62	10.03	16.39
-0.44								
Feb		:	21.90	10.79	14.44	3.41	7.93	11.73
0.25								
Mar		:	22.40	11.54	14.87	3.60	8.68	12.12
0.49								
Apr		:	30.30	18.20	22.68	4.68	15.29	19.87
1.45								
May		:	10.90	4.32	4.97	0.66	2.24	2.89
-1.42								
Jun		:	5.10	-0.31	-0.80	0.66	-2.39	-2.88
-1.42								
		:						
AZ		:				Tangerines		
		:						
Nov	1995	:	22.80	16.42	16.90	-0.32	14.34	14.82
-2.40								
Dec		:	22.10	15.56	16.20	-032	13.48	14.12
2.40								
Jan	1996	:	21.80	13.69	15.90	-0.32	11.61	13.82
-2.40								
Feb		:	19.40	9.20	13.50	-0.32	7.12	11.42
-2.40								
Mar		:	18.80	8.16	12.90	-0.32	6.08	10.82
-2.40								
Apr		:	16.30	8.05	10.40	-0.32	5.97	8.32
-2.40								
May		:	13.20	4.44	7.30	-0.32	2.36	5.22
-2.40								
		:						
Nov		:	23.40	16.93	17.50	-0.28	14.85	15.42
-2.36								
Dec		:	25.20	17.18	19.30	-0.28	15.10	17.22
-2.36								
Jan	1997	:	24.70	16.72	18.80	-0.28	14.64	16.72
-2.36								
Feb		:	19.80	11.89	13.90	-0.28	9.81	11.82
-2.36								
Mar		:	18.10	12.20	12.20		10.12	10.12
Apr		:	4.82	-1.08	-1.08		-3.16	-3.16
May		:	4.80	-1.10	-1.10		-3.18	-3.18
		:						
Nov		:	22.60	16.70	16.70		14.62	14.62
Dec		:	23.70	15.03	17.80	-0.28	12.95	15.72
-2.36								

Jan	1998	24.00	12.72	18.10	-0.08	10.64	16.02	-2.16
Feb		20.60	11.67	14.70	0.20	9.59	12.62	-1.88
Mar		18.60	11.01	12.70	0.66	8.93	10.62	-1.42
Apr		15.50	9.60	9.60		7.52	7.52	
May		11.40	4.95	5.50	0.66	2.87	3.42	-1.42

Tangerines: Average Prices and Equivalent Returns, California and Florida, October 1995 - June 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
CA			Tangerines				
Oct	1995	34.80	28.90	28.90		26.82	26.82	
Nov		25.50	17.32	19.60	-0.32	15.24	17.52	-2.40
Dec		20.10	12.39	14.20	-0.32	10.31	12.12	-2.40
Jan	1996	16.70	7.44	10.80	-0.32	5.36	8.72	-2.40
Feb		18.10	6.38	12.20	-0.32	4.30	10.12	-2.40
Mar		19.80	6.22	13.90	-0.32	4.14	11.82	-2.40
Apr		19.60	6.69	13.70	-0.32	4.61	11.62	-2.40
May		18.20	8.09	12.30	-0.32	6.01	10.22	-2.40
Oct		35.90	24.95	30.00	-0.28	22.87	27.92	-2.36
Nov		27.20	17.11	21.30	-0.28	15.03	19.22	-2.36
Dec		22.80	13.38	16.90	-0.28	11.30	14.82	-2.36
Jan	1997	24.60	15.70	18.70	-0.28	13.62	16.62	-2.36

Feb		:	22.40	12.99	16.50	-0.28	10.91	14.42
-2.36								
Mar		:	20.00	11.42	14.10	-0.28	9.34	12.02
-2.36								
Apr		:	22.00	14.61	16.10	-0.28	12.53	14.02
-2.36								
May		:	19.70	13.80	13.80		11.72	11.72
		:						
Oct		:	36.80	20.51	30.90	-0.28	18.43	28.82
-2.36								
Nov		:	26.40	14.66	20.50	-0.28	12.58	18.42
-2.36								
Dec		:	23.60	10.65	17.70	-0.28	8.57	15.62
-2.36								
Jan	1998	:	21.90	10.58	16.00	-0.08	8.50	13.92
-2.16								
Feb		:	18.70	9.61	12.80	0.20	7.53	10.72
-1.88								
Mar		:	20.20	10.64	14.30	0.66	8.56	12.22
-1.42								
Apr		:	21.00	11.77	15.10	0.66	9.69	13.02
-1.42								
May		:	5.40	-0.04	-0.50	0.66	-2.12	-2.58
-1.42								
Jun		:	5.10	-0.31	-0.80	0.66	-2.39	-2.88
-1.42								
		:						
FL		:				Tangerines		
		:						
Oct	1995	:	24.60	12.88	16.05	4.55	9.57	12.85
0.95								
Nov		:	28.10	15.73	19.55	4.77	12.42	16.35
1.17								
Dec		:	26.20	14.44	17.65	5.08	11.13	14.45
1.48								
Jan	1996	:	34.30	17.05	25.75	5.72	13.68	22.55
2.12								
Feb		:	30.00	17.01	21.45	7.00	13.69	18.25
3.40								
Mar		:	31.00	17.95	22.45	7.20	14.63	19.25
3.60								
Apr		:	38.00	22.09	29.45	7.23	18.76	26.25
3.63								
		:						
Oct		:	22.80	11.42	14.25	3.99	8.10	11.05
0.39								
Nov		:	22.40	10.43	13.85	4.66	7.09	10.65
1.06								
Dec		:	21.10	9.71	12.55	4.78	6.37	9.35
1.18								
Jan	1997	:	26.30	11.15	17.75	4.38	7.76	14.55
0.78								
Feb		:	31.20	12.57	22.65	4.28	9.15	19.45
0.68								

Mar		30.00	14.52	21.45	5.40	11.14	18.25
1.80							
Apr		33.00	17.43	24.45	4.50	14.09	21.25
0.90							
May		33.00	15.36	24.45	4.00	11.98	21.25
0.40							
Sep		23.30	13.47	14.70	3.46	10.23	11.50
-0.14							
Oct		21.70	10.00	13.10	3.56	6.67	9.90
-0.04							
Nov		22.30	10.38	13.70	3.58	7.05	10.50
-0.02							
Dec		22.60	10.22	14.00	3.80	6.87	10.80
0.20							
Jan	1998	29.60	13.98	21.00	4.09	10.61	17.80
0.49							
Feb		24.00	11.28	15.40	4.70	7.92	12.20
1.10							
Mar		24.00	12.05	15.40	5.00	8.72	12.20
1.40							
Apr		36.00	21.47	27.40	6.00	18.16	24.20
2.40							

Limes: Average Prices and Equivalent Returns,
Florida, May 1995 - March 1998

State, Month, and Year	F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
	Dollars per box						
FL		All Limes					
May 1995	37.00	26.50	26.50		21.50	21.50	
Jun	16.00	5.11	5.50	3.00	0.11	0.50	
-2.00							
Jul	18.00	6.44	7.50	3.00	1.44	2.50	
-2.00							
Aug	32.00	16.74	21.50	3.00	11.74	16.50	
-2.00							
Sep	26.00	12.12	15.50	3.00	7.12	10.50	
-2.00							

Oct		:	26.00	13.42	15.50	3.00	8.42	10.50
-2.00								
Nov		:	26.00	13.48	15.50	2.00	8.48	10.50
-3.00								
Dec		:	28.00	15.29	17.50	2.00	10.29	12.50
-3.00								
Jan	1996	:	30.00	17.48	19.50	2.00	12.48	14.50
-3.00								
		:						
Jun		:	16.00	5.00	5.50	1.75	0.00	0.50
-3.25								
Jul		:	18.60	6.96	8.10	1.75	1.96	3.10
-3.25								
Aug		:	21.70	8.31	11.20	1.75	3.31	6.20
-3.25								
Sep		:	21.90	8.92	11.40	1.75	3.92	6.40
-3.25								
Oct		:	19.80	7.21	9.30	2.00	2.21	4.30
-3.00								
Nov		:	24.60	10.80	14.10	2.00	5.80	9.10
-3.00								
Dec		:	33.50	17.00	23.00	2.00	12.00	18.00
-3.00								
Jan	1997	:	46.00	35.50	35.50		30.50	30.50
Feb		:	52.00	41.50	41.50		36.50	36.50
		:						
May		:	28.00	17.50	17.50		12.50	12.50
Jun		:	19.00	6.85	8.50	2.00	1.85	3.50
-3.00								
Jul		:	24.00	10.15	13.50	3.00	5.15	8.50
-2.00								
Aug		:	21.00	8.15	10.50	2.80	3.15	5.50
-2.20								
Sep		:	20.00	7.11	9.50	2.80	2.11	4.50
-2.20								
Oct		:	19.00	6.88	8.50	2.00	1.88	3.50
-3.00								
Nov		:	21.00	8.80	10.50	2.00	3.80	5.50
-3.00								
Dec		:	32.00	17.17	21.50	2.00	12.17	16.50
-3.00								
Jan	1998	:	28.00	17.50	17.50		12.50	12.50
		:						
Apr		:	30.00	19.50	19.50		14.50	14.50
May		:	24.00	13.50	13.50		8.50	8.50
Jun		:	25.00	13.11	14.50	2.00	8.11	9.50
-3.00								
Jul		:	23.00	10.67	12.50	2.00	5.67	7.50
-300								
Aug		:	29.00	15.85	18.50	2.00	10.85	13.50
-3.00								
Sep		:	26.00	13.93	15.50	2.00	8.93	10.50
-3.00								

Oct	:	24.00	11.97	13.50	2.00	6.97	8.50
-3.00							
Nov	:	24.00	11.34	13.50	2.00	6.34	8.50
-3.00							
Dec	:	22.00	11.50	11.50		6.50	6.50

Tangelos and Temples: Average Prices and Equivalent Returns, Florida, November 1995 - March 1998

State, Month, and Year		F.O.B. Packed	Equiv. P.H.D. All	Equiv. P.H.D. Fresh	Equiv. P.H.D. Proc.	Equiv. On-Tree All	Equiv. On-Tree Fresh	Equiv. On-Tree Proc.
		Dollars per box						
FL					Tangelos			
Nov	1995	15.50	6.19	8.10	4.30	3.66	5.65	1.70
Dec		14.00	5.85	6.60	5.10	3.33	4.15	2.50
Jan	1996	18.00	6.59	10.60	5.20	4.03	8.15	2.60
Feb		22.00	6.21	14.60	5.60	3.62	12.15	3.00
Nov		15.00	5.80	7.60	4.30	3.27	5.15	1.70
Dec		13.30	4.88	5.90	4.30	2.33	3.45	1.70
Jan	1997	14.30	4.38	6.90	4.00	1.80	4.45	1.40
Feb		12.50	4.05	5.10	4.00	1.46	2.65	1.40
Oct		15.50	3.45	8.00	2.00	0.89	5.60	-0.60
Nov		15.00	4.68	7.50	2.00	2.17	5.10	-0.60
Dec		12.80	3.98	5.30	2.90	1.47	2.90	0.30
Jan	1998	14.90	3.84	7.40	3.25	1.26	5.00	0.65
Feb		18.00	4.23	10.50	3.80	1.65	8.10	1.20

FL				Temples			
Jan	1996	15.50	7.01	8.50	5.70	4.93	6.45
3.60							
Feb		13.20	5.98	6.20	5.90	3.90	4.15
3.80							
Mar		15.50	6.87	8.50	6.60	4.78	6.45
4.50							
Jan	1997	1730	7.05	10.30	4.25	5.13	8.60
2.15							
Feb		13.60	4.54	6.60	4.10	2.51	4.90
2.00							
Mar		14.00	4.48	7.00	4.25	2.41	5.30
2.15							
Jan	1998	14.50	5.06	7.40	3.50	3.04	5.50
1.40							
Feb		12.00	4.57	4.90	4.50	2.51	3.00
2.40							
Mar		13.50	5.39	6.40	5.20	3.32	4.50
3.10							

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Asparagus					
CA						
1996	84.50	84.50	87.90	85.30	85.70	81.10
1997	161.00	140.00	116.00	104.00	92.40	154.00
1998	179.00	158.00	144.00	134.00	123.00	164.00
WA						
1996				110.00	108.00	118.00
1997				105.00	102.00	112.00

	1998 :				94.00	83.50	115.00
US	:						
	1993 :	121.00	113.00	80.70	107.00	78.70	106.00
	1994 :	135.00	141.00	97.60	88.50	92.90	97.00
	1995 :	150.00	118.00	93.60	160.00	93.20	103.00
	1996 :	84.50	84.50	87.90	87.30	95.40	108.00
	1997 :	161.00	140.00	116.00	105.00	97.40	109.00
	1998 :	179.00	158.00	144.00	130.00	106.00	114.00
	:						
	:			Broccoli			
	:						
CA	:						
	1996 :	34.60	22.00	30.90	25.20	28.20	30.60
	1997 :	36.80	27.80	25.90	24.20	23.10	30.30
	1998 :	33.80	26.80	30.70	40.70	27.10	29.60
US	:						
	1993 :	32.60	28.10	28.60	23.70	22.30	26.80
	1994 :	23.50	2140	19.50	21.80	27.10	21.10
	1995 :	24.70	34.30	54.40	34.00	26.50	27.30
	1996 :	34.60	22.00	30.90	25.20	28.20	30.60
	1997 :	36.80	27.80	25.90	24.20	23.10	30.30
	1998 :	34.70	27.00	31.40	40.50	27.10	29.60
	:						
	:			Carrots			
	:						
CA	:						
	1996 :	12.50	13.70	15.90	15.70	11.60	11.00
	1997 :	14.90	14.60	13.30	12.50	12.50	12.60
	1998 :	12.50	12.70	12.70	12.00	11.40	11.50
MI	:						
	1996 :						
	1997 :						
	1998 :						
TX	:						
	1996 :	13.40	14.80	15.90	15.80	15.80	

	1997	17.30	17.30	17.30	17.30	17.30
	1998	18.00	19.40	20.70	20.30	22.70
US						
	1993	18.00	13.20	11.20	12.70	11.20
10.20						
	1994	10.70	10.40	11.50	10.30	12.10
12.10						
	1995	19.20	16.90	18.70	19.40	19.20
15.20						
	1996	12.60	13.80	15.90	15.70	12.00
11.00						
	1997	15.00	14.80	13.50	12.60	12.60
12.60						
	1998	13.60	12.90	12.90	12.40	11.80
11.80						

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continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Asparagus			
CA						
1996	80.00					
1997						
1998	234.00	211.00	199.00	152.00	148.00	
WA						
1996	118.00					
1997	112.00					
1998	115.00					
US						
1993	122.00	171.00	176.00	146.00		
1994	143.00	144.00	196.00	151.00		
1995	105.00					
1996	108.00					
1997	101.00					
1998	127.00	211.00	199.00	152.00	148.00	
			Broccoli			

CA	:					
	1996 :	24.10	24.10	23.90	24.30	31.10
28.60						
	1997 :	27.50	23.30	31.20	40.70	27.00
30.20						
	1998 :	23.30	27.60	29.20	32.80	29.70
35.00						
US	:					
	1993 :	24.50	20.00	36.60	22.40	24.20
30.00						
	1994 :	21.60	18.50	38.60	37.00	57.70
46.00						
	1995 :	19.50	31.30	27.70	23.60	20.80
26.90						
	1996 :	24.10	24.10	23.90	24.30	31.10
28.60						
	1997 :	27.50	23.30	31.20	40.70	27.00
30.20						
	1998 :	23.30	27.60	29.20	32.80	29.70
35.00						
	:					
	:			Carrots		
	:					
CA	:					
	1996 :	10.40	14.10	12.50	12.50	17.00
17.20						
	1997 :	12.50	12.50	12.50	12.50	12.30
16.90						
	1998 :	10.60	10.40	10.20	10.60	11.50
11.70						
MI	:					
	1996 :		16.00	11.90	9.90	11.60
12.00						
	1997 :		16.50	13.00	9.50	13.00
13.00						
	1998 :		13.50	12.40	12.90	14.10
14.10						
TX	:					
	1996 :					
	1997 :					
	1998 :					
US	:					
	1993 :	9.04	10.10	9.98	10.30	11.00
10.90						
	1994 :	13.50	16.10	15.30	15.30	15.10
15.70						
	1995 :	15.00	16.10	16.10	15.30	15.50
13.00						
	1996 :	10.50	14.50	12.60	12.00	16.00
17.20						
	1997 :	12.60	13.20	12.70	12.00	12.50
16.80						
	1998 :	10.60	10.80	10.60	11.00	11.80
11.70						

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Cauliflower					
CA						
1996	35.20	36.10	52.80	37.00	37.70	35.70
1997	29.60	33.80	32.60	27.70	20.70	31.20
1998	35.10	44.00	49.50	43.80	35.50	26.40
NY						
1996						
1997						
1998						
US						
1993	34.30	29.10	24.70	44.90	26.90	37.00
1994	24.80	2490	23.10	20.80	32.20	29.10
1995	31.40	31.50	53.90	68.40	47.70	37.60
1996	35.20	36.10	52.80	37.00	37.70	35.70
1997	29.60	33.80	32.60	27.70	20.70	31.20
1998	35.10	44.00	49.50	43.80	35.50	26.40
	Celery					
CA						
1996	7.90	8.50	12.20	11.60	8.90	11.50
1997	16.20	16.20	12.30	10.50	15.40	9.89
1998	11.20	11.40	16.40	13.80	15.40	12.40
MI						

1996 :						
1997 :						
1998 :						
US :						
1993 :	24.00	35.60	27.40	16.50	14.40	9.45
1994 :	11.40	8.85	7.78	8.34	13.50	8.92
1995 :	24.30	26.00	20.60	33.30	24.50	14.40
1996 :	7.90	8.50	12.20	11.60	8.90	11.50
1997 :	16.20	16.20	12.30	10.50	15.40	9.89
1998 :	11.20	11.40	16.40	13.80	15.40	12.40

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continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
	Cauliflower					
CA :						
1996 :	24.30	26.80	22.60	28.70	30.00	31.10
1997 :	38.90	22.90	34.50	49.30	27.60	28.90
1998 :	23.20	25.30	31.30	23.60	42.30	50.00
NY :						
1996 :		33.30	33.30	33.30		
1997 :		34.80	34.80	34.80		
1998 :		37.00	37.30	33.40		
US :						
1993 :	28.30	29.30	38.70	27.40	21.60	30.90
1994 :	31.40	24.30	34.00	31.30	42.50	29.80

1995	26.70	34.20	25.40	21.10	22.60	33.20
1996	24.30	27.20	23.80	29.20	30.00	31.10
1997	38.90	23.40	34.60	46.90	27.60	28.90
1998	23.20	26.00	32.30	25.90	42.30	50.00
			Celery			
CA						
1996	11.10	9.20	10.80	9.30	12.40	13.40
1997	19.00	16.40	14.00	13.40	18.40	19.10
1998	9.99	9.39	9.80	9.91	11.90	14.00
MI						
1996	16.50	13.00	13.50	12.90		
1997	23.60	19.40	15.40	13.50		
1998	15.80	14.00	14.10	14.40		
US						
1993	9.41	11.80	14.20	13.30	11.50	11.10
1994	12.40	14.90	12.60	12.00	13.90	25.50
1995	11.60	10.50	16.50	13.20	12.90	11.40
1996	11.50	10.30	11.60	9.79	12.40	13.40
1997	19.30	17.00	14.30	13.40	18.40	19.10
1998	10.60	10.40	10.60	10.40	11.90	14.00

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
			Sweet Corn			

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CA          :
       1996 :                                          21.50      17.10
16.20
       1997 :                                          20.30      18.80
14.90
       1998 :                                          33.60      20.00
14.80
FL          :
       1996 :    29.90      30.20      28.90      22.00      17.60
13.10
       1997 :    29.00      25.80      33.90      26.40      22.00
18.60
       1998 :    18.70      31.60      24.20      19.60      16.30
12.70
MI          :
       1996 :
       1997 :
       1998 :
NJ          :
       1996 :
       1997 :
       1998 :
NY          :
       1996 :
       1997 :
       1998 :
OH          :
       1996 :
       1997 :
       1998 :
PA          :
       1996 :
       1997 :
       1998 :
US          :
       1993 :    23.30      39.20      25.20      23.50      20.60
17.70
       1994 :    24.50      15.50      22.80      18.50      20.40
20.20
       1995 :    25.00      44.70      27.80      16.60      24.50
18.80
       1996 :    29.90      30.20      28.90      21.90      17.50
14.00
       1997 :    29.00      25.80      33.90      26.00      21.20
17.00
       1998 :    18.70      31.60      24.20      19.60      16.90
13.80
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Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Sweet Corn			
CA						
1996	16.70	16.10	19.50	19.20	20.00	21.00
1997	15.80	14.90	16.50	18.20	19.80	19.70
1998	12.60	11.00	15.20	26.20	25.60	24.50
FL						
1996	12.00			16.60	18.90	16.80
1997	12.60			13.70	18.10	20.00
1998					22.40	18.00
MI						
1996	30.00	17.00	15.00			
1997		18.90	16.40			
1998	17.80	16.30	18.20			
NJ						
1996	26.70	19.10	16.00	20.30		
1997	24.60	20.40	15.80	17.60		
1998	16.40	18.30	21.50	23.00		
NY						
1996	10.00	16.10	14.90	14.50		
1997	22.00	15.90	13.50	14.00		
1998	19.00	17.20	18.70			
OH						
1996	20.80	15.70	16.20			
1997	21.50	15.90	15.80			
1998	19.70	18.50	16.60			
PA						
1996	21.90	20.70	19.60			
1997	28.40	29.30	27.10			
1998	23.70	23.60	22.90			
US						
1993	18.50	16.80	14.70	22.10	16.60	24.30
1994	19.10	11.90	15.30	19.70	19.90	26.00

1995	18.60	17.10	18.50	20.70	24.00	23.30
1996	18.90	17.40	16.70	17.90	19.40	17.70
1997	18.40	18.10	16.90	15.30	18.90	19.90
1998	16.80	16.60	18.20	25.40	23.50	19.40

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Lettuce					
AZ-Yuma						
1996	9.03	17.20	12.80			
1997	14.80	9.40	13.40	13.70		
1998	18.80	10.70	11.60	24.40	13.10	
AZ-Other						
1996			15.90	11.10	12.00	20.50
1997			14.70	8.70	8.89	
1998				27.90	15.00	
CA						
1996	17.80	9.26	17.20	13.30	13.20	15.10
1997	15.20	10.00	13.80	15.80	10.50	14.70
1998	19.40	11.30	16.60	28.10	14.70	11.40
NJ						
1996					38.60	19.80
1997						25.30
1998						29.70
NM						
1996				6.80	8.74	
1997				13.70	8.90	
1998				8.70	8.95	

NY						
	1996					
	1997					15.00
	1998					
US						
	1993	10.80	18.70	14.30	37.80	12.60	11.50
	1994	7.91	11.80	9.71	11.70	11.40	13.80
	1995	13.40	9.32	27.00	48.20	47.00	15.60
	1996	11.30	14.90	16.50	13.20	13.30	15.20
	1997	14.90	9.58	13.50	15.60	10.40	14.90
	1998	19.00	10.90	12.50	24.60	14.10	11.80

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continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Lettuce			
AZ-Yuma						
1996					12.40	8.65
1997						23.20
1998						
AZ-Other						
1996			13.50	12.60	18.20	23.00
1997				34.10	39.70	
1998				23.50	8.80	
CA						
1996	12.70	23.60	13.60	15.60	20.50	9.52

1997	17.00	22.80	22.30	35.10	29.40	14.00
1998	15.40	16.20	14.00	21.30	10.80	9.00
NJ						
1996	13.50	15.00	26.30	16.40	34.70	
1997	26.40	26.00	34.40	28.80	31.90	
1998	50.00	50.00	45.60	28.00	25.90	
NM						
1996				13.20	20.30	
1997				38.70	39.10	
1998				9.90	11.60	
NY						
1996	13.00	13.00	13.00			
1997	15.00	15.00	15.00	15.00		
1998				20.00		
US						
1993	18.80	14.90	16.80	12.20	10.50	8.28
1994	10.60	10.90	17.30	22.10	22.40	37.20
1995	12.60	15.20	25.60	13.30	11.50	16.10
1996	12.70	23.50	13.70	15.40	17.70	8.87
1997	17.10	22.80	22.30	34.80	29.90	21.30
1998	15.50	16.30	14.00	21.10	10.90	9.00

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Spring Onions					
AZ						
1996				8.00	8.50	9.00
1997				17.40	13.60	15.40

	1998 :				17.00
13.10					
CA	:				
	1996 :			10.70	9.60
9.90					
	1997 :			16.60	12.60
15.50					
	1998 :			15.90	14.40
13.40					
TX	:				
	1996 :		8.74	9.45	10.10
	1997 :			17.90	14.00
18.30					
	1998 :			22.80	20.30
20.80					
US	:				
	1993 :		25.40	33.10	23.80
10.40					
	1994 :		14.20	10.10	8.64
8.69					
	1995 :		18.60	22.20	14.60
9.35					
	1996 :		8.74	9.53	9.75
9.75					
	1997 :			17.60	13.20
16.20					
	1998 :			22.40	18.20
16.50					
	:				
	:		Summer Onions		
	:		Non-Storage		
	:				
NM	:				
	1996 :				
12.40					
	1997 :				
16.50					
	1998 :				
12.40					
TX	:				
	1996 :				
	1997 :				
	1998 :				
WA	:				
	1996 :				
25.20					
	1997 :				
19.40					
	1998 :				
26.50					
US	:				
	1993 :				14.60
10.30					

1994							8.27
1995							11.80
1996							12.80
1997							16.90
1998							12.70
			Summer Onions				
			Storage				
CA							
1996	15.90	15.80	16.00				
1997	19.60	14.60					
1998	17.00	21.00	23.00				
CO							
1996	12.90	9.70	8.90				
1997	11.20	9.20	7.90				
1998	14.00	17.30					
ID, E-OR							
1996	9.60	7.10	5.20				
1997	9.70	7.50	8.13	10.40			
1998	13.60	16.30	23.00	14.60			
MI							
1996	9.50	9.50	9.00				
1997	10.00	0 20.70	24.00	23.30			
1996	18.90	17.40	16.70	17.90	19.40		17.70
1997	18.40	18.10	16.90	15.30	18.90		19.90
1998	16.80	16.60	18.20	25.40	23.50		19.40

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
			Lettuce			

AZ-Yuma	:					
1996	:	9.03	17.20	12.80		
1997	:	14.80	9.40	13.40	13.70	
1998	:	18.80	10.70	11.60	24.40	13.10
AZ-Other	:					
1996	:			15.90	11.10	12.00
20.50						
1997	:			14.70	8.70	8.89
1998	:				27.90	15.00
CA	:					
1996	:	17.80	9.26	17.20	13.30	13.20
15.10						
1997	:	15.20	10.00	13.80	15.80	10.50
14.70						
1998	:	19.40	11.30	16.60	28.10	14.70
11.40						
NJ	:					
1996	:					38.60
19.80						
1997	:					
25.30						
1998	:					
29.70						
NM	:					
1996	:				6.80	8.74
1997	:				13.70	8.90
1998	:				8.70	8.95
NY	:					
1996	:					
1997	:					
15.00						
1998	:					
US	:					
1993	:	10.80	18.70	14.30	37.80	12.60
11.50						
1994	:	7.91	11.80	9.71	11.70	11.40
13.80						
1995	:	13.40	9.32	27.00	48.20	47.00
15.60						
1996	:	11.30	14.90	16.50	13.20	13.30
15.20						
1997	:	14.90	9.58	13.50	15.60	10.40
14.90						
1998	:	19.00	10.90	12.50	24.60	14.10
11.80						

continued

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Lettuce			
AZ-Yuma						
1996					12.40	8.65
1997						23.20
1998						
AZ-Other						
1996			13.50	12.60	18.20	23.00
1997				34.10	39.70	
1998				23.50	8.80	
CA						
1996	12.70	23.60	13.60	15.60	20.50	9.52
1997	17.00	22.80	22.30	35.10	29.40	14.00
1998	15.40	16.20	14.00	21.30	10.80	9.00
NJ						
1996	13.50	15.00	26.30	16.40	34.70	
1997	26.40	26.00	34.40	28.80	31.90	
1998	50.00	50.00	45.60	28.00	25.90	
NM						
1996				13.20	20.30	
1997				38.70	39.10	
1998				9.90	11.60	
NY						
1996	13.00	13.00	13.00			
1997	15.00	15.00	15.00	15.00		
1998				20.00		
US						
1993	18.80	14.90	16.80	12.20	10.50	8.28
1994	10.60	10.90	17.30	22.10	22.40	37.20
1995	12.60	15.20	25.60	13.30	11.50	16.10
1996	12.70	23.50	13.70	15.40	17.70	8.87
1997	17.10	22.80	22.30	34.80	29.90	21.30

1998	15.50	16.30	14.00	21.10	10.90	9.00

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Spring Onions					
AZ						
1996				8.00	8.50	9.00
1997				17.40	13.60	15.40
1998					17.00	13.10
CA						
1996				10.70	9.60	9.90
1997				16.60	12.60	15.50
1998				15.90	14.40	13.40
TX						
1996			8.74	9.45	10.10	
1997				17.90	14.00	18.30
1998				22.80	20.30	20.80
US						
1993			25.40	33.10	23.80	10.40
1994			14.20	10.10	8.64	8.69
1995			18.60	22.20	14.60	9.35
1996			8.74	9.53	9.75	9.75
1997				17.60	13.20	16.20
1998				22.40	18.20	16.50

			Summer Onions			
			Non-Storage			
NM						
	1996					
12.40						
	1997					
16.50						
	1998					
12.40						
TX						
	1996					
	1997					
	1998					
WA						
	1996					
25.20						
	1997					
19.40						
	1998					
26.50						
US						
	1993					14.60
10.30						
	1994					
8.27						
	1995					
11.80						
	1996					
12.80						
	1997					
16.90						
	1998					
12.70						
			Summer Onions			
			Storage			
CA						
	1996	15.90	15.80	16.00		
	1997	19.60	14.60			
	1998	17.00	21.00	23.00		
CO						
	1996	12.90	9.70	8.90		
	1997	11.20	9.20	7.90		
	1998	14.00	17.30			
ID, E-OR						
	1996	9.60	7.10	5.20		
	1997	9.70	7.50	8.13	10.40	
	1998	13.60	16.30	23.00	14.60	
MI						
	1996	9.50	9.50	9.00		
	1997	10.00	10.50	11.00		

1998	7.20	9.40	11.60			

Summer storage onions continued on page 58. -- continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Spring Onions			
AZ						
1996	9.50					
1997						
1998						
CA						
1996	9.50					
1997	14.10					
1998	21.10					
TX						
1996						
1997						
1998						
US						
1993	10.90					
1994	10.20					
1995	11.20					
1996	9.50					
1997	14.10					
1998	25.20					
			Summer Onions			
			Non-Storage			
NM						
1996	14.40	14.00				
1997	14.30	12.10				
1998	14.00	12.10				
TX						
1996	13.20	12.20				
1997	14.00	14.00				
1998	24.70	20.40				
WA						

	1996	20.60	20.60			
	1997	15.90	15.90			
	1998	26.00	26.00			
US						
	1993	13.80	14.40	13.10		
	1994	13.90	10.10			
	1995	14.90	11.40			
	1996	14.60	13.90			
	1997	14.30	12.80			
	1998	18.30	15.90			
				Summer Onions		
				Storage		
CA						
	1996	9.50	10.00	13.10	15.60	12.10
16.40						
	1997	14.10	14.20	11.20	9.90	12.40
16.20						
	1998	20.20	13.50	13.40	12.20	13.00
16.50						
CO						
	1996	13.50	14.50	14.40	14.40	14.50
13.50						
	1997		14.60	11.60	11.00	11.40
12.30						
	1998		14.70	14.40	15.10	16.80
17.00						
ID, E-OR						
	1996		14.10	13.00	11.10	10.30
10.10						
	1997		12.20	9.10	8.30	10.20
10.90						
	1998		10.90	11.90	12.40	14.20
15.90						
MI						
	1996			12.40	11.40	10.50
10.00						
	1997			10.60	8.80	8.00
8.00						
	1998			10.60	8.80	8.00
8.00						

Summer storage onions continued on page 59.

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State					

and Year	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
			Summer Onions Storage			
NY						
1996	14.90	22.40	11.40	9.35		
1997	9.10	8.10	7.65	8.40		
1998	9.10	8.10	7.65	8.40		
OH						
1996						
1997	8.00	8.00	8.00			
1998	9.00	9.00	9.00			
OR-West						
1996	10.70	11.00	11.00	11.00		
1997	9.40	8.00	10.10	11.20		
1998	9.50	10.00	11.00	12.00		
WA						
1996	9.75	7.50	6.95	4.80	4.80	
1997	7.80	6.00	7.95	14.00	14.00	
1998	13.30	15.90	21.20	15.00	15.00	
			Summer Onions Storage			
US						
1993	16.60	14.00	16.30	19.40		
1994	31.40	33.90	18.90	13.90		
1995	13.50	17.60	17.80	15.70	16.60	
1996	10.70	10.10	7.98	7.39	4.80	
1997	9.75	7.87	8.09	11.60	14.00	
1998	11.40	13.50	17.10	14.00	15.00	
			All Summer Onions			
US						
1993	16.60	14.00	16.30	19.40	14.60	10.30
1994	31.40	33.90	18.90	13.90		8.27
1995	13.50	17.60	17.80	15.70	16.60	11.80
1996	10.70	10.10	7.98	7.39	4.80	12.80
1997	9.75	7.87	8.09	11.60	14.00	16.90
1998	11.40	13.50	17.10	14.00	15.00	11.80

		All Onions				
US						
1993	16.60	14.00	17.30	31.00	23.60	10.40
1994	31.40	33.90	18.80	10.80	8.64	8.49
1995	13.50	17.60	17.90	20.00	14.70	10.40
1996	10.70	10.10	8.11	8.86	9.54	11.10
1997	9.75	7.87	8.09	14.90	13.30	16.50
1998	11.40	13.50	17.10	17.80	17.70	14.90

continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
	Summer Onions Storage					
NY						
1996		13.50	13.50	12.50	10.20	9.70
1997		26.80	15.00	12.00	11.60	11.50
1998		31.40	17.40	15.00	14.30	17.10
OH						
1996		8.00	8.00	8.00	8.00	8.00
1997		9.00	9.00	9.00	9.00	
1998		6.00	5.40	10.00	10.00	9.00
OR-West						
1996				9.60	9.00	8.50

1997 :				10.10	9.70	10.80
1998 :			11.30	10.90	12.80	14.20
WA :						
1996 :		11.70	10.90	9.30	8.30	8.10
1997 :		12.00	8.90	7.70	8.65	9.60
1998 :		11.00	10.00	11.20	12.40	13.80
:						
:			Summer Onions			
:			Storage			
:						
US :						
1993 :	10.90	15.00	13.30	12.10	18.70	24.50
1994 :	10.30	9.31	9.32	10.60	12.20	12.70
1995 :	11.40	8.24	10.00	9.83	9.48	10.10
1996 :	9.59	12.00	12.70	11.50	10.40	10.20
1997 :	14.10	14.00	10.20	9.21	9.87	10.90
1998 :	20.20	13.60	12.80	12.70	14.00	15.90
:						
:			All Summer Onions			
:						
US :						
1993 :	13.00	14.80	13.30	12.10	18.70	24.50
1994 :	12.70	9.54	9.32	10.60	12.20	12.70
1995 :	14.00	9.56	10.00	9.83	9.48	10.10
1996 :	12.50	12.60	12.70	11.50	10.40	10.20
1997 :	14.20	13.60	10.20	9.19	9.86	10.90
1998 :	19.00	14.30	12.80	12.70	14.00	15.90
:						
:			All Onions			
:						
US :						
1993 :	12.70	14.80	13.30	12.10	18.70	24.50
1994 :	12.30	9.54	9.32	10.60	12.20	12.70
1995 :	13.60	9.56	10.00	9.83	9.48	10.10

1996	12.10	12.60	12.70	11.50	10.40	10.20
1997	14.20	13.60	10.20	9.19	9.86	10.90
1998	19.10	14.30	12.80	12.70	14.00	15.90

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
	Winter Strawberries					
FL						
1993	88.00	91.00	59.00	52.00		
1994	80.90	59.00	47.40	40.30		
1995	131.00	92.00	56.00	42.00		
1996	93.00	78.00	51.00	51.00		
1997	97.00	71.00	69.00			
1998	103.00	108.00	72.00	85.00		
	Spring Strawberries					
CA						
1996		80.30	76.70	38.50	45.60	65.00
1997	116.00	98.30	85.80	42.70	54.30	74.80
1998	120.00	147.00	86.50	67.50	67.40	54.60
MI						
1996						78.00
1997						80.00
1998						79.00
US						
1993	102.00	80.20	57.70	42.40	38.30	46.10
1994	77.90	99.00	94.40	57.50	56.40	52.30

1995	65.50	67.00	65.60	57.60	66.90	54.00
1996		80.30	76.70	38.50	45.60	65.40
1997	116.00	98.30	85.80	42.70	54.30	75.10
1998	120.00	147.00	86.50	67.50	67.40	55.50
			All Strawberries			
US						
1993	90.70	88.50	58.40	43.80	38.30	46.10
1994	79.50	71.90	67.90	56.70	56.40	52.30
1995	87.60	80.20	59.20	54.30	66.90	54.00
1996	93.00	79.40	65.90	39.30	45.60	65.40
1997	102.00	78.40	80.40	42.70	54.30	75.10
1998	103.00	119.00	78.00	70.00	67.00	55.00

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continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
			Winter Strawberries			
FL						
1993					150.00	141.00
1994						129.00
1995						144.00
1996						160.00

	1997 :					
184.00						
	1998 :					
108.00						
	:					
	:		Spring Strawberries			
	:					
CA	:					
	1996 :	44.10	54.80	61.50	40.70	
	1997 :	56.20	53.10	67.50	69.80	
	1998 :	56.30	65.00	59.00	80.20	116.00
MI	:					
	1996 :	78.00				
	1997 :	80.00				
	1998 :	79.00				
US	:					
	1993 :	32.80	46.90	48.90	64.20	93.70
	1994 :	49.50	49.00	46.60	82.40	89.90
	1995 :	50.70	63.30	41.50	49.70	115.00
	1996 :	44.70	54.80	61.50	40.70	
	1997 :	56.60	53.10	67.50	69.80	
	1998 :	56.50	65.00	59.00	80.20	116.00
	:					
	:		All Strawberries			
	:					
US	:					
	1993 :	32.80	46.90	48.90	64.20	95.70
141.00						
	1994 :	49.50	49.00	46.60	82.40	89.90
129.00						
	1995 :	50.70	63.30	41.50	49.70	115.00
144.00						
	1996 :	44.70	54.80	61.50	40.70	
160.00						
	1997 :	56.60	53.10	67.50	69.80	
184.00						
	1998 :	56.00	65.00	59.00	80.00	116.00
108.00						

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	: Jan	: Feb	: Mar	: Apr	: May	: Jun
	:	:	:	:	:	:
	: Dollars per Cwt					

			Tomatoes			
AR						
	1996					37.00
	1997					40.00
	1998					33.30
CA						
	1996					35.90
	1997					36.90
	1998					29.20
FL						
	1996	18.40	40.00	81.70	50.50	23.60
	1997	33.50	47.30	58.80	26.30	32.40
	1998	26.40	44.00	34.00	37.20	37.10
MI						
	1996					
	1997					
	1998					
NJ						
	1996					
	1997					
	1998					
NY						
	1996					
	1997					
	1998					
SC						
	1996					29.30
	1997					59.90
	1998					24.90
VA						
	1996					
	1997					
	1998					
US						
	1993	38.30	21.90	21.20	45.20	58.10
	1994	41.50	19.30	24.50	16.50	20.60
	1995	41.10	29.80	37.10	20.50	14.70

1996	18.40	40.00	81.70	50.50	24.40	24.20
1997	33.50	47.30	58.80	26.30	3340	32.60
1998	26.40	44.00	34.00	37.20	36.50	17.80

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continued

Vegetables for Fresh Market: Prices Received Monthly, by State, 1996-98, and United States, 1993-98

State and Year	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
	Tomatoes					
AR						
1996	40.00	40.00				
1997	32.00	32.00				
1998	44.30					
CA						
1996	23.50	20.60	22.40	27.60	29.40	25.30
1997	25.40	25.40	23.20	23.30	41.10	
1998	43.10	20.40	26.60	43.10	35.80	
FL						
1996				29.30	29.70	30.70
1997				31.00	48.10	48.80
1998				55.90	46.30	47.70
MI						
1996		24.20	24.20	24.20		
1997		24.20	24.20	24.20		
1998		38.50	38.50	38.50		
NJ						
1996	46.00	28.00	28.70	44.00	43.20	
1997	58.40	31.50	27.40	30.90		
1998	50.00	36.60	32.60	50.00		
NY						
1996	100.00	40.00	17.50	20.00		
1997	30.00	30.00	28.30	29.10		
1998	80.00	31.40	22.80			

SC	:					
	1996 :	30.20	28.30	28.90	37.60	32.80
	1997 :	27.50	27.90	33.00		
	1998 :	28.70	24.40			
VA	:					
	1996 :	23.00	24.00	26.00	25.50	
	1997 :	36.00	35.00	34.00	30.00	30.00
	1998 :	41.00	34.50	32.50	31.00	
US	:					
	1993 :	23.30	32.70	29.80	19.40	31.60
57.60						
	1994 :	26.90	30.60	22.70	28.50	31.20
37.40						
	1995 :	24.40	19.60	19.50	22.50	33.10
25.00						
	1996 :	26.00	22.10	23.40	28.30	29.70
30.40						
	1997 :	28.60	27.30	25.20	27.40	45.40
48.80						
	1998 :	40.60	25.50	28.60	44.90	43.60
47.70						

Cows 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
AZ	43.00	37.60	42.10	39.40	38.40	34.50
AR	33.90	34.80	34.80	35.30	34.40	34.70
CA	32.50	33.50	34.50	35.50	35.50	34.50
CO	35.60	36.90	36.80	37.00	36.60	36.50
FL	35.00	37.40	36.10	37.30	37.10	35.60
GA	34.70	36.10	35.50	36.20	36.10	35.40
ID	31.80	34.00	33.20	34.60	34.60	34.30
IL	34.70	35.10	34.90	35.60	37.50	36.20

IA	:	36.80	38.30	38.20	37.80	38.90
37.70						
KS	:	36.10	37.20	36.90	36.50	36.10
35.60						
KY	:	35.00	37.00	37.00	38.00	38.00
37.00						
LA	:	35.30	37.30	37.30	36.40	34.90
34.80						
MI	:	34.70	34.40	37.30	37.20	36.50
37.50						
MN	:	33.00	36.70	35.60	35.60	38.80
37.10						
MO	:	34.50	36.00	35.80	36.30	37.50
37.20						
MT	:	35.30	37.30	38.10	39.90	37.20
37.10						
NE	:	37.30	37.70	38.30	3590	35.60
36.50						
NM	:	38.50	40.10	40.60	40.80	39.40
39.00						
ND	:	36.60	38.50	38.30	38.90	39.30
39.00						
OH	:	32.60	34.90	33.80	35.30	35.70
35.70						
OK	:	37.10	36.80	36.50	36.50	35.40
34.90						
OR	:	38.10	37.80	38.30	38.90	39.90
37.80						
PA	:	34.20	36.00	35.30	36.70	37.70
37.50						
SD	:	32.40	34.00	34.50	37.40	36.90
38.80						
TN	:	34.80	35.90	35.10	36.80	36.80
37.40						
TX	:	33.70	35.30	36.40	35.30	33.20
34.20						
VA	:	32.10	32.40	32.00	33.70	34.90
35.00						
WI	:	35.40	36.80	36.00	36.60	37.20
36.30						
WY	:	35.80	37.00	38.60	38.50	38.20
38.40						

Year	:	United States
1998	:	34.50 36.00 36.00 36.20 36.40 36.10
1997	:	30.00 33.30 36.90 38.20 38.20 37.50
1996	:	32.00 32.10 31.40 29.40 30.40 30.60

1995	38.70	41.50	39.90	38.00	36.80
38.20					
1994	45.50	47.00	47.40	47.20	45.90
43.60					
1993	47.80	49.20	48.30	48.50	49.80
50.20					

continued

Cows 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998 (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
AZ	34.50	36.50	34.20	29.50	26.90	30.50
AR	34.60	32.20	28.60	26.70	26.20	25.90
CA	33.00	34.50	33.50	30.00	29.50	30.30
CO	35.50	35.10	33.10	30.30	30.40	30.60
FL	34.00	33.70	30.70	28.30	30.00	30.30
GA	33.80	32.70	30.40	29.10	29.00	30.20
ID	32.90	33.30	30.70	28.10	27.70	29.60
IL	35.50	34.70	33.00	31.10	28.70	28.70
IA	36.80	35.10	33.10	30.60	29.80	32.40
KS	34.50	33.30	31.50	28.30	27.30	28.70
KY	36.00	35.00	33.00	30.00	30.00	30.00
LA	33.40	33.00	31.10	28.70	29.60	30.10
MI	34.10	36.70	31.80	31.00	29.80	31.00
MN	36.20	35.50	33.20	32.30	31.00	32.40

MO	:	35.30	34.70	32.40	29.80	29.00
29.80						
MT	:	37.60	37.20	32.90	31.40	30.10
30.60						
NE	:	34.50	32.90	32.50	31.90	29.50
29.60						
NM	:	36.60	36.20	34.20	31.80	31.60
32.40						
ND	:	36.50	35.60	32.20	29.60	28.30
32.10						
OH	:	34.90	32.80	32.10	27.90	28.70
31.90						
OK	:	32.90	32.70	30.10	28.70	29.00
29.60						
OR	:	35.30	36.10	34.60	30.90	30.50
30.90						
PA	:	36.20	35.70	33.90	31.30	31.30
32.20						
SD	:	37.10	37.60	35.50	31.20	29.50
30.30						
TN	:	34.40	33.80	29.20	27.80	27.80
28.30						
TX	:	32.50	31.80	30.50	29.30	28.40
29.10						
VA	:	32.60	32.30	29.20	27.80	26.30
27.90						
WI	:	35.70	35.20	33.70	31.10	30.40
31.80						
WY	:	36.70	35.50	32.50	31.40	31.90
33.10						
Year	:		United States			
1998	:	34.70	3420	32.60	30.50	29.70
30.80						
1997	:	38.20	36.40	34.40	33.10	31.90
33.00						
1996	:	31.00	31.80	30.80	30.30	28.00
28.30						
1995	:	35.90	35.80	33.90	32.20	29.60
30.40						
1994	:	43.80	43.10	41.50	38.40	37.00
37.40						
1993	:	49.90	48.90	47.10	45.10	44.10
44.00						

1/ Beef Cows and cull Dairy Cows sold for slaughter.

Steers & Heifers: Monthly Prices Received by States, 1998,

and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
AZ	64.30	60.80	62.00	64.30	65.80	66.00
AR	69.70	71.90	72.50	72.60	70.40	65.20
CA	65.00	63.50	64.00	64.00	64.00	62.00
CO	66.90	62.20	64.40	66.60	66.10	64.80
FL	71.80	73.80	72.00	74.10	68.70	64.20
GA	68.50	69.60	71.60	71.50	67.90	64.40
ID	67.30	64.90	66.70	69.10	66.70	64.10
IL	63.20	61.70	62.10	64.20	64.90	63.30
IA	66.40	64.10	61.90	63.70	66.00	63.60
KS	65.40	62.70	64.70	68.10	66.80	65.20
KY	70.00	71.00	72.00	73.00	73.00	70.00
LA	72.50	76.10	75.80	74.70	69.50	63.60
MI	57.80	60.80	59.00	54.90	53.60	55.30
MN	63.60	62.20	61.80	63.30	64.00	64.50
MO	74.00	75.00	75.80	78.00	77.60	73.60
MT	81.50	79.80	78.20	79.00	75.90	71.50
NE	65.90	62.50	63.90	65.60	66.60	64.60
NM	79.80	78.00	76.50	76.90	72.40	72.50
ND	75.10	73.00	73.40	74.30	69.60	64.00
OH	62.30	62.90	60.40	63.50	67.60	6200
OK	76.70	76.40	75.10	75.10	72.50	70.30

OR	74.20	74.90	77.20	76.30	77.20
70.50					
PA	62.90	61.30	60.10	60.70	61.70
60.90					
SD	76.10	71.90	71.80	71.10	66.90
65.70					
TN	73.10	74.10	74.20	76.50	73.30
69.90					
TX	67.80	65.70	66.10	67.20	67.00
65.00					
VA	67.00	67.80	66.30	70.60	71.90
67.50					
WI	62.20	59.40	59.60	61.20	62.00
60.20					
WY	77.80	77.80	73.90	76.00	76.10
73.30					
Year	United States				
1998	66.10	63.30	64.30	66.30	66.30
64.50					
1997	65.20	65.20	67.90	67.90	68.30
64.90					
1996	62.60	61.10	60.20	58.10	57.60
59.60					
1995	71.40	72.10	70.30	66.60	63.60
63.30					
1994	73.00	73.10	75.40	75.40	69.70
64.70					
1993	78.70	79.50	81.40	81.70	80.80
77.60					

continued

Steers & Heifers: Monthly Prices Received by States, 1998, and United States, 1993-1998 (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
AZ	59.30	58.60	57.90	59.90	61.70	59.50

AR	:	65.10	59.70	57.40	59.00	59.90
61.20						
CA	:	60.00	59.00	58.00	60.00	61.00
60.00						
CO	:	60.10	58.80	58.90	62.90	65.50
60.80						
FL	:	59.50	58.60	56.30	55.30	57.20
60.60						
GA	:	59.20	56.90	54.30	55.60	54.50
57.00						
ID	:	60.40	58.10	57.20	60.00	61.30
60.90						
IL	:	59.30	57.80	56.80	58.30	58.80
58.00						
IA	:	59.30	59.70	58.70	59.00	60.70
60.60						
KS	:	61.20	60.20	59.10	63.20	62.80
60.10						
KY	:	64.00	63.00	60.00	61.00	61.00
61.00						
LA	:	59.00	58.90	56.00	58.20	58.80
62.30						
MI	:	52.90	54.30	53.70	55.00	53.50
54.00						
MN	:	63.60	59.80	58.90	58.90	59.20
57.90						
MO	:	68.20	67.70	65.30	65.50	64.80
64.10						
MT	:	69.40	65.60	64.70	69.30	71.00
71.40						
NE	:	61.10	60.10	59.40	61.00	62.20
60.60						
NM	:	67.00	63.90	63.40	65.50	68.10
66.90						
ND	:	57.10	62.70	63.20	65.70	67.10
65.60						
OH	:	60.70	59.90	58.30	58.60	59.30
61.50						
OK	:	67.60	66.10	65.40	67.70	68.20
69.30						
OR	:	63.90	61.40	61.90	62.70	62.10
61.70						
PA	:	59.30	58.40	57.50	57.40	58.40
58.10						
SD	:	57.80	59.30	61.00	67.90	68.20
69.90						
TN	:	63.90	63.40	60.20	60.80	59.70
60.50						
TX	:	62.20	60.30	59.20	61.30	63.10
61.70						
VA	:	58.40	61.10	57.10	58.60	57.30
57.90						
WI	:	55.50	56.30	56.00	57.00	56.60
54.50						

WY	67.90	65.00	65.40	69.50	71.70
71.00					
Year	United States				
1998	61.00	59.70	58.90	61.40	62.30
60.30					
1997	65.40	66.60	67.00	67.30	68.00
66.80					
1996	62.10	64.30	67.90	68.10	68.70
65.50					
1995	61.90	61.70	62.00	62.30	65.20
64.70					
1994	65.00	68.30	66.10	66.10	68.40
68.00					
1993	75.10	75.20	74.50	72.40	72.90
72.00					

Beef Cattle 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
AZ	62.80	59.20	60.40	62.60	65.00	65.10
AR	56.70	59.30	59.70	59.90	55.70	53.30
CA	48.40	48.50	49.80	50.30	51.20	49.90
CO	64.40	60.40	63.10	64.80	64.00	63.40
FL	37.90	41.80	40.40	40.60	39.30	39.00
GA	46.50	49.50	49.90	48.60	47.00	45.30
ID	57.70	58.10	58.70	60.80	59.00	57.60
IL	62.60	61.20	61.60	63.70	64.40	62.80
IA	62.30	60.70	60.00	61.90	63.80	63.00

KS	:	64.20	61.90	63.90	66.80	65.60
64.90						
KY	:	61.60	63.10	63.60	64.60	64.50
62.10						
LA	:	46.50	48.20	48.10	47.50	45.60
43.70						
MI	:	48.60	50.20	50.30	47.80	48.50
50.00						
MN	:	60.70	59.60	57.70	59.00	59.50
59.50						
MO	:	65.70	66.40	66.20	67.60	66.40
64.50						
MT	:	66.30	66.60	69.80	72.00	54.60
47.40						
NE	:	64.90	61.60	63.00	64.70	65.60
63.70						
NM	:	61.20	61.70	63.60	64.60	61.50
60.80						
ND	:	68.60	67.80	67.80	66.80	56.90
49.70						
OH	:	59.30	60.10	57.70	60.70	64.40
59.40						
OK	:	70.80	74.20	74.00	72.50	70.20
66.70						
OR	:	63.40	63.80	65.50	65.10	66.00
60.70						
PA	:	55.40	54.70	53.70	54.50	55.50
54.80						
SD	:	68.70	65.10	68.10	66.70	61.50
59.50						
TN	:	57.80	58.80	58.60	60.60	58.70
56.90						
TX	:	65.40	63.30	63.70	64.30	64.00
62.80						
VA	:	52.00	54.70	57.00	62.10	57.80
55.20						
WI	:	46.70	46.30	45.90	46.90	47.60
46.30						
WY	:	68.60	69.20	69.70	71.90	68.10
63.90						

Year	:	United States				
1998	:	62.50	60.40	61.30	63.00	63.00
61.80						
1997	:	61.40	61.90	64.80	64.80	65.10
62.30						
1996	:	59.00	57.90	56.80	54.90	54.70
56.40						
1995	:	67.60	68.80	66.90	63.30	60.80
60.90						

1994	69.90	70.10	72.30	72.00	67.20	62.70
1993	75.10	75.80	77.20	77.30	77.10	74.50

continued

Beef Cattle 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998 (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
AZ	58.80	58.20	57.40	59.30	61.00	58.90
AR	53.30	49.00	45.30	46.40	46.80	49.90
CA	47.00	47.20	45.80	46.00	46.00	44.50
CO	58.90	57.90	57.90	61.30	61.60	58.40
FL	43.20	39.40	38.90	34.00	37.60	37.60
GA	42.20	41.20	38.30	38.10	36.70	38.80
ID	54.10	53.60	51.40	51.10	50.20	52.10
IL	58.80	57.40	56.30	57.70	58.20	57.40
IA	57.70	58.00	56.70	57.30	59.20	57.80
KS	60.90	59.90	58.50	62.20	61.70	59.20
KY	57.30	56.30	53.30	53.60	53.60	53.60
LA	42.10	4260	40.30	39.60	40.10	40.40
MI	47.30	49.00	44.90	45.40	44.00	44.80
MN	58.90	56.70	55.20	54.30	54.20	54.60
MO	61.00	60.40	58.10	58.40	57.30	53.80

MT	:	48.40	58.50	59.90	61.30	60.40
57.50						
NE	:	60.50	59.40	58.60	60.20	61.10
59.50						
NM	:	55.80	53.10	52.00	51.00	52.40
51.40						
ND	:	43.30	53.20	57.00	59.20	57.00
53.90						
OH	:	58.10	57.20	55.70	55.70	56.20
58.50						
OK	:	62.20	60.70	57.70	58.10	58.90
58.90						
OR	:	55.30	53.80	53.70	53.20	52.60
52.50						
PA	:	53.30	52.50	51.40	50.60	51.30
51.40						
SD	:	52.60	55.80	57.90	63.90	61.20
59.60						
TN	:	52.10	51.60	47.80	47.60	46.90
47.60						
TX	:	60.10	58.30	56.00	58.10	59.60
58.80						
VA	:	49.40	52.20	51.00	52.10	49.20
45.00						
WI	:	44.00	44.10	43.10	42.00	41.40
41.30						
WY	:	54.50	62.90	63.40	66.50	60.20
55.80						
Year	:	United States				
1998	:	58.40	57.40	56.10	58.00	58.10
56.80						
1997	:	62.80	63.90	63.60	63.30	63.30
62.90						
1996	:	59.10	61.30	63.80	63.30	63.40
61.00						
1995	:	59.50	59.40	59.10	58.80	60.70
60.60						
1994	:	62.90	65.90	63.50	62.90	64.40
64.40						
1993	:	72.50	72.70	71.40	69.10	69.30
68.50						

1/ "Cows" and "Steers and Heifers" combined.

Calves: Monthly Prices Received by States, 1998,
and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
AZ	91.20	93.20	95.30	92.50	88.50	75.50
AR	82.00	81.80	86.10	85.70	80.20	73.90
CA	72.00	74.00	73.00	75.00	73.50	70.00
CO	91.80	91.10	94.50	95.00	93.00	81.80
FL	87.20	89.50	90.80	94.20	87.00	76.50
GA	80.90	84.40	86.70	87.10	79.50	73.30
ID	81.00	82.00	84.00	83.00	83.00	79.00
IL	102.00	103.00	104.00	105.00	104.00	100.00
IA	80.90	80.10	79.40	80.50	84.50	75.70
KS	90.00	93.00	96.00	98.00	96.00	86.00
KY	77.00	80.00	84.00	87.00	83.00	77.00
LA	83.60	86.40	87.60	87.20	80.70	75.10
MI	52.00	55.00	55.00	55.00	55.00	52.50
MN	71.00	7400	70.40	72.50	78.20	72.60
MO	82.50	86.80	88.00	90.80	89.00	82.00
MT	91.10	89.60	89.00	88.90	87.00	79.70
NE	88.80	89.30	90.60	92.60	92.00	86.10
NM	90.10	93.20	92.60	94.30	90.00	85.00
ND	87.60	84.90	83.50	87.70	80.60	76.30
OH	72.00	69.80	71.50	78.00	76.80	68.30
OK	89.20	90.40	92.60	92.40	88.20	77.50
OR	78.90	81.60	87.50	84.60	85.50	77.50

PA	78.00	80.00	75.00	80.00	85.00
76.10					
SD	93.50	90.10	90.30	90.00	83.30
83.10					
TN	81.50	83.80	85.10	88.10	81.70
74.80					
TX	89.10	94.00	95.10	94.30	88.00
81.90					
VA	74.10	79.40	82.30	82.90	84.70
75.40					
WI	100.20	99.20	102.00	99.80	103.00
96.00					
WY	93.40	92.20	93.90	94.30	91.00
85.20					
Year	United States				
1998	86.60	88.70	89.80	90.80	88.90
81.70					
1997	68.10	74.90	80.00	82.20	84.30
85.40					
1996	60.50	60.20	59.40	55.10	54.40
55.10					
1995	85.00	86.90	84.40	81.80	77.00
76.90					
1994	93.90	94.90	97.60	95.80	89.40
84.80					
1993	94.70	96.00	98.60	99.60	99.20
99.10					

continued

Calves: Monthly Prices Received by States, 1998, and United States, 1993-1998 (continued)

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
AZ	75.50	78.10	72.60	72.30	74.40	72.50
AR	73.90	73.50	71.20	68.90	70.30	72.80

CA	:	68.00	68.00	63.50	70.00	72.50
73.30						
CO	:	71.90	75.20	74.40	77.10	79.50
82.70						
FL	:	71.00	71.90	66.60	66.00	69.70
75.00						
GA	:	67.20	66.70	63.50	65.90	68.40
72.30						
ID	:	75.00	73.00	70.00	72.00	74.00
75.00						
IL	:	97.00	97.00	94.00	95.00	95.00
95.00						
IA	:	65.00	67.70	71.30	69.00	68.80
70.50						
KS	:	83.00	79.00	74.00	78.00	81.00
81.00						
KY	:	69.00	70.00	65.00	66.00	66.00
68.00						
LA	:	68.00	68.20	65.60	68.20	70.90
75.20						
MI	:	54.00	54.00	48.60	47.00	45.00
50.00						
MN	:	63.80	66.80	62.60	65.20	60.60
68.70						
MO	:	75.50	75.50	72.20	71.60	71.50
74.50						
MT	:	74.80	76.60	76.80	75.80	76.40
77.70						
NE	:	75.00	74.70	74.60	79.50	76.60
84.40						
NM	:	75.30	75.10	70.60	71.00	76.90
76.80						
ND	:	72.60	71.30	70.90	73.70	74.30
73.40						
OH	:	62.60	61.40	58.40	57.80	55.20
61.40						
OK	:	72.30	73.50	71.10	74.40	79.80
82.20						
OR	:	70.00	67.30	68.10	70.60	70.20
70.00						
PA	:	78.00	83.00	75.50	80.40	82.10
83.00						
SD	:	83.10	83.10	79.50	81.90	80.80
80.10						
TN	:	67.70	68.10	63.80	64.60	65.70
69.30						
TX	:	76.50	76.50	75.10	75.00	79.40
81.10						
VA	:	64.20	64.60	62.80	64.50	63.20
66.20						
WI	:	92.70	96.10	94.80	95.50	96.60
99.50						
WY	:	85.20	83.30	78.00	78.40	78.90
79.70						

Year	United States					
1998	76.60	76.90	74.10	75.70	77.50	80.20
1997	86.90	88.00	86.90	84.30	82.90	83.30
1996	56.80	59.30	61.00	60.10	61.20	61.80
1995	72.00	70.90	68.50	66.20	64.10	63.30
1994	83.80	84.40	80.00	78.20	81.00	81.90
1993	96.90	95.10	93.50	93.90	91.60	92.80

Milk Cows 1/: Quarterly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Apr	Jul	Oct
	Dollars per Head			
AL	1090	1080	1100	1150
AZ	1170	1260	1240	1280
AR	980	1020	1020	1030
CA	1220	1260	1290	1310
CO	1130	1200	1200	1300
FL	1200	1150	1160	1270
GA	1090	1150	1150	1200
ID	1100	1170	1180	1180
IL	1060	1140	1150	1170
IN	1000	1060	1080	1120
IA	1020	1090	1100	1200
KS	1070	1120	1100	1120
KY	1000	1000	1040	1090
LA	990	1050	1060	1100
MD	1080	1150	1110	1200
MI	1080	1110	1120	1190
MN	990	1050	1030	1110
MS	1020	1020	1040	1080
MO	920	930	1000	1075
NE	1150	1130	1130	1160
NM	1130	1190	1200	1240

NY	980	1000	1020	1050
NC	1110	1140	1140	1170
ND	940	1020	1020	1080
OH	1030	1000	1070	1200
OK	1020	1050	1060	1080
OR	1120	1150	1150	1230
PA	1030	1080	1160	1180
TN	1020	1060	1060	1100
TX	1070	1110	1120	1200
UT	1050	1100	1140	1160
VT	1050	1060	1070	1120
VA	1160	1180	1140	1170
WA	1150	1170	1200	1250
WI	1030	1060	1060	1140
Year	United States			
1998	1070	1110	1120	1180
1997	1090	1110	1100	1090
1996	1060	1070	1090	1130
1995	1150	1140	1130	1090
1994	1170	1190	1160	1160
1993	1140	1160	1170	1170

1/ Cows sold for dairy herd replacement.

Hogs 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Dec 2/	Jan	Feb	Mar	Apr	May
	Dollars per Cwt					
GA	37.70	32.50	33.60	34.50	34.90	39.00
IL	39.70	34.30	33.90	33.50	34.20	41.30
IN	39.10	34.10	34.20	33.70	34.50	41.60
IA	43.60	37.70	37.40	36.50	37.10	44.10
KS	39.00	34.80	33.10	33.00	33.50	39.30
KY	40.80	33.70	36.60	35.60	35.60	44.30

MI	41.90	36.40	36.30	36.50	36.50	42.20
MN	43.10	36.30	37.30	35.40	35.40	42.40
MO	38.20	33.60	33.30	33.00	33.60	39.60
NE	44.50	39.00	38.70	37.40	37.70	43.70
NC	41.50	36.30	35.00	33.50	35.30	42.20
OH	40.70	35.10	37.00	36.10	36.50	43.40
PA	40.10	33.80	34.10	32.60	32.70	38.80
SC	37.10	32.70	33.70	34.30	34.30	40.80
SD	42.00	36.60	36.60	35.80	36.40	42.50
TN	39.90	34.00	33.70	33.20	33.70	40.80
TX	38.90	32.60	31.70	30.10	31.20	36.10
VA	41.30	35.30	34.30	34.40	36.40	44.40
WI	38.30	34.70	32.80	32.40	32.60	39.40
US						
1998	41.60	36.00	35.90	34.90	35.60	42.30
1997	55.60	53.80	52.80	49.40	53.80	58.20
1996	43.50	42.60	46.50	48.70	49.70	56.80
1995	30.90	36.80	39.10	37.80	35.60	37.10
1994	40.40	43.50	47.90	44.40	42.70	42.70
1993	41.70	41.20	44.00	46.50	45.40	46.90

	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Cwt					
GA	41.40	34.90	33.10	26.40	23.70	17.80
IL	41.10	35.00	33.60	27.70	25.30	16.20
IN	41.10	35.50	32.70	27.20	25.60	16.30

IA	:	43.80	38.20	37.20	31.70	29.80
20.80						
KS	:	39.50	34.50	33.00	27.90	25.10
16.70						
KY	:	44.30	38.50	35.40	30.50	27.70
19.80						
MI	:	40.80	35.30	33.40	27.20	26.20
17.00						
MN	:	43.50	38.20	36.70	30.30	29.00
19.30						
MO	:	39.20	33.80	31.60	26.20	24.10
14.10						
NE	:	44.30	39.60	37.90	32.10	31.40
22.30						
NC	:	42.00	36.50	35.10	29.40	26.50
18.20						
OH	:	43.10	0	75.80	76.40	77.70
NE	:	75.00	74.70	74.60	79.50	76.60
84.40						
NM	:	75.30	75.10	70.60	71.00	76.90
76.80						
ND	:	72.60	71.30	70.90	73.70	74.30
73.40						
OH	:	62.60	61.40	58.40	57.80	55.20
61.40						
OK	:	72.30	73.50	71.10	74.40	79.80
82.20						
OR	:	70.00	67.30	68.10	70.60	70.20
70.00						
PA	:	78.00	83.00	75.50	80.40	82.10
83.00						
SD	:	83.10	83.10	79.50	81.90	80.80
80.10						
TN	:	67.70	68.10	63.80	64.60	65.70
69.30						
TX	:	76.50	76.50	75.10	75.00	79.40
81.10						
VA	:	64.20	64.60	62.80	64.50	63.20
66.20						
WI	:	92.70	96.10	94.80	95.50	96.60
99.50						
WY	:	85.20	83.30	78.00	78.40	78.90
79.70						

Year	:	United States
1998	:	76.60 76.90 74.10 75.70 77.50
80.20		
1997	:	86.90 88.00 86.90 84.30 82.90
83.30		
1996	:	56.80 59.30 61.00 60.10 61.20
61.80		

1995	72.00	70.90	68.50	66.20	64.10
63.30					
1994	83.80	84.40	80.00	78.20	81.00
81.90					
1993	96.90	95.10	93.50	93.90	91.60
92.80					

Milk Cows 1/: Quarterly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Apr	Jul	Oct
	Dollars per Head			
AL	1090	1080	1100	1150
AZ	1170	1260	1240	1280
AR	980	1020	1020	1030
CA	1220	1260	1290	1310
CO	1130	1200	1200	1300
FL	1200	1150	1160	1270
GA	1090	1150	1150	1200
ID	1100	1170	1180	1180
IL	1060	1140	1150	1170
IN	1000	1060	1080	1120
IA	1020	1090	1100	1200
KS	1070	1120	1100	1120
KY	1000	1000	1040	1090
LA	990	1050	1060	1100
MD	1080	1150	1110	1200
MI	1080	1110	1120	1190
MN	990	1050	1030	1110
MS	1020	1020	1040	1080
MO	920	930	1000	1075
NE	1150	1130	1130	1160
NM	1130	1190	1200	1240
NY	980	1000	1020	1050
NC	1110	1140	1140	1170
ND	940	1020	1020	1080
OH	1030	1000	1070	1200
OK	1020	1050	1060	1080
OR	1120	1150	1150	1230
PA	1030	1080	1160	1180
TN	1020	1060	1060	1100
TX	1070	1110	1120	1200
UT	1050	1100	1140	1160
VT	1050	1060	1070	1120

VA	1160	1180	1140	1170
WA	1150	1170	1200	1250
WI	1030	1060	1060	1140
Year	United States			
1998	1070	1110	1120	1180
1997	1090	1110	1100	1090
1996	1060	1070	1090	1130
1995	1150	1140	1130	1090
1994	1170	1190	1160	1160
1993	1140	1160	1170	1170

1/ Cows sold for dairy herd replacement.

Hogs 1/: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Dec 2/	Jan	Feb	Mar	Apr	May
	Dollars per Cwt					
GA	37.70	32.50	33.60	34.50	34.90	39.00
IL	39.70	34.30	33.90	33.50	34.20	41.30
IN	39.10	34.10	34.20	33.70	34.50	41.60
IA	43.60	37.70	37.40	36.50	37.10	44.10
KS	39.00	34.80	33.10	33.00	33.50	39.30
KY	40.80	33.70	36.60	35.60	35.60	44.30
MI	41.90	36.40	36.30	36.50	36.50	42.20
MN	43.10	36.30	37.30	35.40	35.40	42.40
MO	38.20	33.60	33.30	33.00	33.60	39.60
NE	44.50	39.00	38.70	37.40	37.70	43.70
NC	41.50	36.30	35.00	33.50	35.30	42.20
OH	40.70	35.10	37.00	36.10	36.50	43.40

PA	40.10	33.80	34.10	32.60	32.70	38.80
SC	37.10	32.70	33.70	34.30	34.30	40.80
SD	42.00	36.60	36.60	35.80	36.40	42.50
TN	39.90	34.00	33.70	33.20	33.70	40.80
TX	38.90	32.60	31.70	30.10	31.20	36.10
VA	41.30	35.30	34.30	34.40	36.40	44.40
WI	38.30	34.70	32.80	32.40	32.60	39.40
US						
1998	41.60	36.00	35.90	34.90	35.60	42.30
1997	55.60	53.80	52.80	49.40	53.80	58.20
1996	43.50	42.60	46.50	48.70	49.70	56.80
1995	30.90	36.80	39.10	37.80	35.60	37.10
1994	40.40	43.50	47.90	44.40	42.70	42.70
1993	41.70	41.20	44.00	46.50	45.40	46.90

	Jun	Jul	Aug	Sep	Oct	Nov
			Dollars per Cwt			
GA	41.40	34.90	33.10	26.40	23.70	17.80
IL	41.10	35.00	33.60	27.70	25.30	16.20
IN	41.10	35.50	32.70	27.20	25.60	16.30
IA	43.80	38.20	37.20	31.70	29.80	20.80
KS	39.50	34.50	33.00	27.90	25.10	16.70
KY	44.30	38.50	35.40	30.50	27.70	19.80
MI	40.80	35.30	33.40	27.20	26.20	17.00
MN	43.50	38.20	36.70	30.30	29.00	19.30
MO	39.20	33.80	31.60	26.20	24.10	14.10

NE	44.30	39.60	37.90	32.10	31.40
22.30					
NC	42.00	36.50	35.10	29.40	26.50
18.20					
OH	43.10	38.30	35.60	29.40	28.60
20.10					
PA	39.60	35.10	32.60	25.00	24.40
17.00					
SC	41.20	36.10	33.70	26.40	24.00
16.40					
SD	42.40	37.70	35.00	30.90	30.00
21.50					
TN	40.50	35.10	33.00	26.70	25.70
17.70					
TX	36.90	30.70	29.80	27.50	23.60
25.60					
VA	41.60	35.90	34.60	29.20	28.00
18.30					
WI	39.30	34.10	32.00	26.50	25.20
15.70					
US					
1998	42.40	36.90	35.20	29.50	27.80
18.80					
1997	57.80	58.90	55.30	50.40	47.30
45.10					
1996	56.40	58.60	59.70	54.70	55.60
54.40					
1995	42.20	46.30	48.60	48.40	45.70
39.90					
1994	42.70	42.20	41.80	35.40	31.80
28.00					
1993	48.10	45.70	47.30	47.80	46.90
42.50					

1/ "Sows" and "Barrows and Gilts" combined. 2/ Preceding year.

Barrows and Gilts: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Dec 1/	Jan	Feb	Mar	Apr	May
	Dollars per Cwt					
GA	38.10	33.30	34.50	35.40	35.80	43.30
IL	40.30	35.10	34.70	34.10	34.80	42.40

IN	39.70	35.00	35.10	34.50	35.30	43.10
IA	43.80	37.90	37.50	36.70	37.30	44.40
KS	39.80	36.00	33.90	33.70	34.40	40.90
KY	41.00	34.00	37.00	36.00	36.00	45.00
MI	42.70	37.20	37.00	37.40	37.50	45.00
MN	43.40	36.60	37.60	35.70	35.70	42.90
MO	38.60	34.20	33.90	33.50	34.40	40.50
NE	44.60	39.10	38.80	37.50	37.80	43.90
NC	41.60	36.40	35.10	33.60	35.40	42.30
OH	41.20	35.60	37.30	36.40	37.00	44.40
PA	41.40	35.00	35.40	33.90	34.30	41.10
SC	37.30	32.80	34.10	34.80	34.80	41.60
SD	43.30	38.10	38.00	36.80	37.50	44.10
TN	40.60	34.90	34.50	34.00	34.60	42.20
TX	40.60	34.00	32.80	30.90	32.50	38.10
VA	41.50	35.40	34.50	34.60	36.60	44.70
WI	39.50	36.50	34.10	33.50	33.80	41.50
US						
1998	42.00	36.50	36.30	35.30	36.00	43.10
1997	56.10	54.10	53.00	49.60	54.40	58.80
1996	44.30	43.20	47.30	49.50	50.60	57.70
1995	31.70	37.60	39.80	38.20	35.90	37.50
1994	41.00	44.10	48.40	44.80	43.00	43.10
1993	42.50	41.90	44.70	47.00	45.80	47.50

	Jun	Jul	Aug	Sep	Oct	Nov

	:	Dollars per Cwt				
	:					
GA	:	42.40	35.80	34.50	27.20	24.40
18.10						
IL	:	42.20	35.90	34.60	28.60	26.00
16.40						
IN	:	42.60	36.60	34.00	28.20	26.40
16.40						
IA	:	44.30	38.50	37.50	31.90	30.00
21.00						
KS	:	41.00	35.60	34.40	29.10	25.70
16.90						
KY	:	45.00	39.00	36.00	31.00	28.00
20.00						
MI	:	45.10	38.80	35.80	29.20	27.90
17.50						
MN	:	44.10	38.70	37.10	30.80	29.30
19.40						
MO	:	40.50	34.70	32.70	26.90	24.50
14.10						
NE	:	44.50	39.80	38.10	32.30	31.50
22.40						
NC	:	42.10	36.60	35.20	29.50	26.60
18.20						
OH	:	44.10	39.00	36.10	29.70	28.90
20.20						
PA	:	42.00	36.90	34.60	26.60	26.50
17.30						
SC	:	42.00	36.70	34.40	26.90	24.30
16.10						
SD	:	44.00	39.40	37.00	32.50	31.30
22.60						
TN	:	41.80	36.00	34.20	27.70	26.50
18.00						
TX	:	39.90	31.70	31.10	28.50	24.20
26.80						
VA	:	41.90	36.20	34.90	29.50	28.20
18.40						
WI	:	41.40	35.60	33.90	28.20	26.50
16.20						
	:					
US	:					
1998	:	43.20	37.60	35.90	30.10	28.20
19.00						
1997	:	58.40	59.70	55.90	50.90	47.80
45.60						
1996	:	57.10	59.40	60.30	55.10	56.00
54.60						
1995	:	43.20	47.40	49.60	49.20	46.10
40.40						
1994	:	43.40	43.20	42.80	36.00	32.30
28.60						
1993	:	48.90	46.60	48.30	48.50	47.50
43.20						

1/ Preceding year.

Sows: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Dec 1/	Jan	Feb	Mar	Apr	May
			Dollars per Cwt			
GA	34.00	25.40	25.30	26.00	27.10	28.80
IL	32.70	25.10	25.40	26.00	26.20	28.40
IN	33.40	25.80	25.70	26.40	27.10	28.10
IA	34.00	29.10	28.80	28.70	28.20	31.80
KS	32.90	27.10	27.80	27.10	27.90	29.90
KY	35.00	26.00	27.00	27.00	27.00	28.00
MI	32.30	26.00	26.00	25.10	25.50	26.50
MN	34.10	27.70	28.30	27.90	27.90	30.20
MO	33.20	26.50	27.00	26.40	26.70	27.30
NE	33.80	27.70	28.40	28.10	28.10	29.80
NC	34.80	28.00	28.00	27.70	28.70	29.40
OH	33.70	26.80	26.00	26.00	26.60	28.40
PA	32.90	26.90	26.50	25.20	23.80	25.60
SC	35.00	30.90	28.60	27.30	26.80	28.00
SD	31.60	26.90	27.50	26.90	26.60	29.60
TN	33.20	25.40	26.00	26.20	26.00	28.50
TX	31.00	24.90	24.30	24.50	23.40	25.80
VA	31.30	27.90	24.50	26.40	26.20	27.20
WI	30.30	22.80	23.90	24.80	24.30	25.60

US						
1998	33.20	26.50	26.60	26.70	26.70	28.60
1997	48.40	46.60	47.20	45.20	44.80	48.40
1996	31.60	31.60	33.00	35.20	36.10	41.40
1995	19.40	24.80	29.10	31.10	29.40	28.50
1994	31.20	34.30	37.70	38.70	38.00	35.60
1993	31.00	31.70	34.60	39.00	39.40	38.00

	Jun	Jul	Aug	Sep	Oct	Nov
			Dollars per Cwt			
GA	29.30	27.20	20.30	18.20	17.80	15.40
IL	28.00	25.20	21.50	17.10	18.20	13.70
IN	27.10	26.00	20.60	18.40	18.50	15.50
IA	32.40	27.00	23.80	20.20	20.70	16.50
KS	29.80	26.80	22.80	19.50	20.70	15.20
KY	28.00	26.00	22.00	18.00	20.00	16.00
MI	26.40	23.40	18.50	14.70	15.70	11.50
MN	30.40	27.00	25.40	20.00	20.20	16.50
MO	27.60	26.50	20.30	16.20	17.60	14.00
NE	27.80	26.50	23.20	19.70	21.00	16.10
NC	29.40	27.60	23.30	20.30	20.90	18.50
OH	27.70	25.90	21.70	17.80	18.50	16.80
PA	25.90	24.90	21.20	16.60	17.20	15.80
SC	28.90	26.80	22.10	19.30	19.50	18.50
SD	30.40	27.90	22.80	19.10	20.10	14.40
TN	28.30	26.90	22.40	18.00	18.50	15.20

TX	24.70	23.60	22.40	21.50	18.40
19.00					
VA	26.20	23.20	18.50	15.50	16.50
11.90					
WI	25.60	23.80	19.00	14.80	16.20
12.00					
US					
1998	28.80	26.00	21.80	18.20	18.80
15.50					
1997	46.20	45.90	44.40	40.30	38.20
35.10					
1996	44.90	46.70	48.90	47.00	49.10
50.00					
1995	28.60	28.90	34.00	35.30	38.20
32.10					
1994	32.70	29.60	29.80	26.80	24.20
19.30					
1993	36.90	34.70	35.30	37.20	36.80
35.00					

1/ Preceding year.

Lambs: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
			Dollars per Cwt			
CA	81.50	78.00	71.00	69.00	63.00	90.00
CO	81.60	76.10	69.90	62.80	59.60	89.60
ID	74.20	63.00	61.00	57.00	61.00	82.00
IA	75.00	68.00	66.20	61.30	65.40	88.00
KS	73.00	69.00	69.00	63.00	60.00	90.00
MN	76.40	71.00	69.10	65.00	71.40	92.60
MT	87.80	77.10	70.90	70.30	71.00	89.70
NE	73.00	67.00	70.30	78.00	88.40	91.50
OH	78.40	74.10	76.40	77.90	76.00	86.20

OR	77.00	71.00	65.30	64.90	67.40
73.60					
SD	79.00	71.30	68.00	66.90	63.40
92.00					
TX	74.30	75.30	71.70	67.30	63.80
89.30					
UT	77.00	76.00	71.00	70.00	70.00
82.00					
WY	76.00	73.50	70.30	65.60	6130
92.00					
US					
1998	78.80	75.00	70.10	66.00	63.00
88.90					
1997	94.50	99.80	99.70	96.40	90.80
86.50					
1996	76.20	84.30	86.60	85.90	90.30
100.70					
1995	68.20	70.50	74.80	74.60	80.40
85.70					
1994	60.60	59.40	58.60	54.50	54.50
63.00					
1993	67.30	72.70	76.00	68.10	61.50
55.70					

	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
CA	84.00	79.00	78.00	71.00	64.00	66.00
CO	84.70	85.50	77.90	71.70	62.60	63.50
ID	76.00	71.30	60.00	65.00	59.30	60.80
IA	81.40	81.80	70.10	60.10	56.90	58.40
KS	85.00	86.00	79.00	72.00	63.00	64.00
MN	78.70	78.50	71.20	64.50	58.30	61.80
MT	80.80	79.40	69.00	67.00	68.60	71.60
NE	81.00	79.20	67.30	64.40	54.70	61.30
OH	74.30	73.80	71.60	66.50	63.20	65.30
OR	66.50	64.00	62.20	62.00	61.30	62.50
SD	81.60	78.30	72.10	68.90	67.60	68.90

TX	83.00	84.00	74.30	69.70	63.70
67.00					
UT	78.00	78.00	68.00	62.00	59.00
65.00					
WY	84.00	80.10	71.50	69.30	63.00
66.10					
US					
1998	81.30	80.10	71.80	67.60	62.60
64.70					
1997	81.10	92.70	90.20	87.20	83.10
83.90					
1996	98.30	89.10	88.50	87.00	84.60
88.20					
1995	85.70	85.60	82.70	77.60	77.10
76.50					
1994	72.80	75.50	71.20	68.00	70.60
69.10					
1993	53.90	59.20	64.50	64.50	65.80
66.00					

Sheep: Monthly Prices Received by States, 1998, and United States, 1993-1998

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
CA	35.50	33.00	36.50	35.50	30.00	32.00
CO	41.50	40.60	39.90	33.90	30.00	31.20
ID	31.70	34.00	37.00	39.30	35.00	32.00
IA	38.60	36.90	38.50	30.40	31.40	24.70
KS	36.00	38.00	39.00	30.00	26.00	22.00
MN	38.20	38.70	37.50	30.20	26.90	22.80
MT	39.00	39.90	41.90	35.10	26.70	26.60
NE	42.00	37.70	35.60	29.90	27.70	28.30
OH	40.50	36.60	39.60	32.20	28.40	25.60

OR	32.00	33.50	32.00	34.40	30.40	28.00
SD	44.50	40.70	41.40	33.40	26.80	24.50
TX	46.00	45.50	47.90	41.80	32.20	33.30
UT	40.00	37.00	37.00	37.00	35.00	29.00
WY	45.10	42.90	43.90	33.20	27.70	31.00
US						
1998	40.70	39.60	41.00	34.40	30.30	30.20
1997	41.50	41.30	42.50	37.50	34.00	36.60
1996	34.20	33.80	34.00	27.30	25.30	26.60
1995	32.50	37.10	31.70	29.50	27.90	28.30
1994	35.10	37.00	34.30	29.60	29.30	33.60
1993	33.10	35.20	36.10	27.30	29.10	28.90

	Jul	Aug	Sep	Oct	Nov	Dec
			Dollars per Cwt			
CA	29.00	29.00	27.50	26.50	25.50	28.50
CO	31.70	29.30	25.70	24.60	26.70	31.40
ID	29.00	29.80	27.00	27.00	24.30	29.40
IA	26.40	23.80	27.40	25.20	29.80	37.10
KS	24.00	22.00	23.00	22.00	24.00	29.00
MN	23.70	23.00	23.90	21.60	20.50	27.10
MT	29.90	28.50	25.40	24.80	25.50	32.70
NE	29.40	29.60	29.40	25.90	27.80	27.50
OH	29.80	33.10	28.50	28.20	31.60	31.90
OR	27.00	30.70	30.00	29.00	29.00	29.00
SD	31.30	26.60	29.40	25.70	28.50	25.70

TX	34.00	30.90	32.20	28.80	32.50
41.80					
UT	26.00	26.00	20.00	20.00	21.00
25.00					
WY	30.00	25.90	25.70	28.00	26.40
29.70					
US					
1998	29.40	28.30	26.80	26.10	26.40
30.10					
1997	39.40	38.40	33.90	35.80	38.90
37.70					
1996	30.50	29.10	30.20	28.80	29.80
34.20					
1995	28.60	27.00	26.00	24.50	23.80
26.00					
1994	30.10	29.40	27.90	27.30	30.50
34.70					
1993	29.00	28.50	25.80	24.60	25.70
30.30					

Broilers: Prices Received by Month, States, 1998; and United States, 1993-98 1/

State	Dec 2/	Jan	Feb	Mar	Apr	May
	Dollars Per Pound					
AL	.330	.345	.355	.365	.370	.390
AR	.320	.310	.310	.330	.350	.350
CA	355	.355	.355	.360	.365	.375
DE	.300	.320	.330	.345	.365	.395
GA	.330	.345	.360	.375	.375	.390
MD	.300	.320	.330	.345	.365	.395
MS	.315	.335	.355	.360	.365	.385
NC	.340	.350	.370	.370	.375	.370
PA	.300	.340	.330	.340	.360	.370

TX	: .330	.320	.320	.330	.340	.350
VA	: .310	.330	.340	.350	.360	.370

Year	: United States					
1998	: .324	.336	.343	.354	.364	.375
1997	: .407	.390	.377	.369	.367	.368
1996	: .362	.372	.353	.341	.349	.378
1995	: .325	.324	.325	.327	.323	.319
1994	: .339	.337	.344	.353	.356	.376
1993	: .315	.318	.322	.330	.338	.352

State	: Jun	: Jul	: Aug	: Sep	: Oct	: Nov
AL	: .420	.455	.470	.460	.435	.410
AR	: .390	.420	.460	.470	.430	.420
CA	: .400	.435	.465	.460	.450	.430
DE	: .440	.450	.485	.450	.410	.390
GA	: .420	.455	.475	.465	.445	.415
MD	: .440	.450	.485	.450	.410	.390
MS	: .415	.445	.465	.450	.425	.405
NC	: .380	.440	.465	.455	.430	.410
PA	: .430	.435	.475	.435	.420	.390
TX	: .380	.420	.460	.470	.460	.440
VA	: .400	.430	.470	.440	.430	.400

Year	: United States

1998	.406	.440	.468	.459	.434	.413
1997	.374	.400	.399	.382	.347	.337
1996	.406	.405	.403	.402	.395	.404
1995	.332	.347	.374	.381	.368	.376
1994	.375	.364	.351	.351	.339	.323
1993	.350	.355	.364	.365	.350	.348

1/ Equivalent liveweight returns to producers. Derived from ready-to-cook (RTC) prices using the following formula: (RTC price minus processing cost) * (dressing percentage) = equivalent liveweight price.
2/ December preceding year.

Turkeys: Prices Received, Monthly by State, 1998; United States, 1993-98 1/

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Pound					
AR	.36	.33	.34	.37	.36	.37
CA	.40	.40	.37	.37	.37	.37
IN	.36	.36	.36	.37	.37	.38
IA	.39	.39	.39	.39	.39	.39
MN	.36	.36	.37	.36	.35	.34
MO	.34	.33	.34	.36	.36	.37
NC	.34	.31	.32	.34	.34	.35
PA	.34	.33	.35	.35	.35	.35
VA	.34	.31	.33	.34	.34	.35
Year	United States					

1998	: .355	.341	.347	.357	.355	.359
1997	: .388	.369	.381	.397	.413	.416
1996	: .409	.420	.418	.422	.432	.444
1995	: .396	.374	.383	.383	.384	.393
1994	: .370	.373	.384	.392	.399	.403
1993	: .356	.357	.376	.376	.377	.376

State	: Jul	Aug	Sep	Oct	Nov	Dec
	: Dollars per Pound					
AR	: .41	.41	.43	.47	.49	.43
CA	: .37	.40	.42	.45	.46	.45
IN	: .39	.40	.40	.42	.44	.40
IA	: .37	.37	.38	.38	.38	.37
MN	: .34	.34	.35	.34	.33	.33
MO	: .41	.41	.44	.48	.50	.45
NC	: .37	.40	.41	.46	.47	.42
PA	: .38	.40	.41	.43	.43	.42
VA	: .38	.40	.42	.46	.48	.41

Year	: United States					
1998	: .375	.386	.402	.427	.438	.403
1997	: .411	.410	.411	.410	.419	.387
1996	: .450	.443	.442	.451	.455	.432
1995	: .396	.419	.436	.452	.473	.440

1994	.406	.421	.431	.445	.443	.422
1993	.387	.396	.411	.432	.427	.408

1/ IN, IA, MN and PA are actual liveweight prices. All other State prices are equivalent liveweight returns to producers. Derived from ready-to-cook (RTC) prices using the following formula: (RTC price minus processing cost) * (dressing percentage) = equivalent liveweight price.

Market Eggs: Prices Received by Month by State 1998, and United States, 1993-1998 1/

State	Dec 2/	Jan	Feb	Mar	Apr	May
	Dollars per Dozen					
AL	.620	.590	.460	.580	.460	.380
AR	.630	.590	.400	.550	.390	.340
CA	.720	.692	.550	.550	.545	.370
CT	.690	.640	.520	.610	.520	.370
FL	.690	.560	.520	.540	.470	.340
GA	.687	.607	.514	.574	.466	.388
IN	.700	.650	.570	.620	.560	.460
IA	.584	.534	.362	.515	.361	.263
ME	.750	.700	.580	.660	.560	.440
MI	.660	.570	.440	.570	.440	.320
MN	.600	.500	.430	.510	.430	.330
MS	.780	.650	.590	.660	.540	.450
MO	.581	.539	.370	.508	.330	.260
NY	.723	.703	.573	.653	.564	.460

NC	.664	.561	.427	.572	.397	.310
OH	.717	.680	.585	.598	.564	.458
PA	.720	.700	.580	.600	.570	.460
SC	.630	.558	.524	.519	.509	.440
TX	.680	.575	.490	.590	.460	.350
WA	.695	.698	.515	.515	.505	.440
Year	United States					
1998	.680	.626	.511	.572	.495	.387
1997	.798	.661	.654	.608	.530	.507
1996	.692	.681	.647	.692	.649	.569
1995	.508	.491	.486	.486	.486	.419
1994	.523	.505	.522	.547	.487	.454
1993	.544	.530	.513	.603	.559	.483

See footnotes at end of table.
(continued)

Market Eggs: Prices Received by Month by State 1998, and United States, 1993-1998 1/ (continued)

State	Jun	Jul	Aug	Sep	Oct	Nov
	Dollars per Dozen					
AL	.410	.420	.430	.450	.500	.550
AR	.390	.370	.390	.410	.500	.570
CA	.492	.425	.550	.520	.540	.610
CT	.460	.480	.560	.590	.620	.670

FL	:	.390	.370	.500	.440	.470
.550						
GA	:	.449	.425	.508	.503	.541
.613						
IN	:	.490	.470	.590	.540	.580
.660						
IA	:	.372	.336	.398	.387	.425
.501						
ME	:	.510	.520	.600	.640	.680
.730						
MI	:	.410	.450	.500	.480	.520
.560						
MN	:	.390	.400	.440	.430	.470
.510						
MS	:	.540	.490	.560	.620	.610
.690						
MO	:	.330	.370	.380	.370	.450
.500						
NY	:	.520	.530	.600	.652	.616
.692						
NC	:	.416	.387	.431	.424	.464
.518						
OH	:	.466	.446	.517	.508	.540
.663						
PA	:	.460	.480	.590	.540	.560
.660						
SC	:	.403	.440	.480	.480	.536
.575						
TX	:	.467	.460	.549	.496	.574
.643						
WA	:	.557	.580	.580	.615	.645
.710						
Year	:	United States				
1998	:	.448	.434	.516	.496	.532
.610						
1997	:	.449	.525	.498	.575	.531
.711						
1996	:	.583	.577	.626	.651	.627
.726						
1995	:	.436	.479	.505	.545	.544
.658						
1994	:	.439	.445	.470	.477	.444
.503						
1993	:	.517	.468	.510	.447	.491
.521						

1/ 1994-1997 revised.
2/ December preceding year.

All Eggs: Prices Received by Month, United States, 1993-98 1/

Year	Dec 2/	Jan	Feb	Mar	Apr	May
	Dollars per Dozen					
1998	.787	.743	.649	.699	.637	.549
1997 3/	.879	.765	.761	.723	.660	.642
1996 3/	.790	.782	.757	.791	.758	.693
1995 3/	.620	.611	.607	.604	.608	.555
1994 3/	.636	.623	.640	.657	.613	.587
1993	.641	.635	.620	.696	.692	.633

	Jun	Jul	Aug	Sep	Oct	Nov
1998	.596	.582	.650	.633	.663	.728
1997 3/	.594	.656	.631	.696	.659	.808
1996 3/	.707	.698	.737	.758	.735	.820
1995 3/	.573	.609	.629	.664	.663	.757
1994 3/	.577	.584	.603	.608	.577	.617
1993	.663	.577	.611	.555	.600	.630

1/ Includes hatching and market eggs.
2/ December preceding year.
3/ Revised.

Milk, Sold to Plants, Eligible for Fluid Market 1/: Prices Received, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun

		Dollars per Cwt			
AL	16.10	16.20	16.00	15.90	15.40
15.10					
AZ	14.30	14.50	14.10	13.60	12.50
13.50					
AR	15.00	15.30	15.00	14.70	14.00
14.20					
CA	13.56	14.03	13.39	13.15	12.96
13.94					
CO	14.30	14.50	14.40	13.90	13.00
13.60					
FL	17.40	17.70	17.30	17.00	16.70
16.80					
GA	16.00	16.40	16.30	16.40	15.90
15.10					
ID	13.40	13.70	13.00	12.30	11.30
13.40					
IL	14.90	15.10	14.80	14.30	13.10
14.00					
IN	14.50	14.70	14.50	14.30	13.70
13.50					
IA	15.70	14.80	14.60	13.60	12.70
14.40					
KS	14.40	14.50	14.30	13.50	12.60
13.40					
KY	15.00	15.40	15.20	14.80	14.40
14.10					
LA	15.40	15.70	15.70	15.70	15.30
15.00					
MD	14.90	15.30	15.00	14.90	14.40
14.50					
MI	14.70	15.10	14.80	14.50	13.80
13.80					
MN	14.93	14.94	14.39	13.52	12.59
14.32					
MS	15.40	15.70	15.70	15.70	15.30
15.00					
MO	15.20	15.40	15.10	15.20	13.70
14.10					
NE	14.50	14.80	14.60	13.70	12.80
13.60					
NM	14.10	14.10	13.70	13.10	12.70
13.40					
NY	14.70	14.90	14.70	14.20	13.40
14.00					
NC	16.30	16.70	16.50	16.40	15.70
15.40					
ND	14.50	14.30	13.90	14.10	12.30
13.60					

OH	: 14.90	15.00	15.00	14.60	13.80	13.50
OK	: 15.10	15.30	14.80	14.50	13.50	14.00
OR	: 14.20	14.60	14.50	14.00	13.50	14.70
PA	: 15.40	15.50	15.40	15.20	14.20	14.50
TN	: 15.40	15.80	15.60	14.90	14.80	14.50
TX	: 15.40	15.40	14.70	14.60	14.00	14.10
UT	: 13.80	14.00	13.10	13.00	12.70	13.10
VT	: 15.20	15.20	15.20	14.90	14.60	15.10
VA	: 15.90	16.60	15.80	15.90	15.40	15.20
WA	: 14.30	14.20	14.60	14.00	13.50	14.40
WI	: 14.81	14.81	14.38	13.54	12.45	14.30
Year	: United States					
1998	: 14.70	14.80	14.50	14.00	13.30	14.10
1997	: 13.50	13.50	13.60	13.20	12.80	12.30
1996	: 14.20	14.00	13.90	13.90	14.30	14.90
1995	: 12.60	12.60	12.60	12.30	12.30	12.20
1994	: 13.60	13.50	13.50	13.50	12.90	12.70
1993	: 12.60	12.30	12.20	12.70	13.00	13.10

continued

Milk, Sold to Plants, Eligible for Fluid Market 1/: Prices Received, Monthly,
by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec

	Dollars per Cwt				
AL	14.50	16.50	18.00	18.20	18.40
19.00					
AZ	13.80	15.10	16.00	16.80	16.30
15.60					
AR	13.60	15.60	17.00	17.40	17.60
18.40					
CA	14.39	15.62	16.68	18.08	17.22
17.17					
CO	13.10	15.00	16.30	17.20	17.50
18.00					
FL	15.90	18.30	20.00	20.20	20.70
21.30					
GA	13.80	16.20	17.90	18.10	18.20
19.10					
ID	14.10	14.40	15.60	16.70	17.70
17.80					
IL	13.70	14.90	15.70	16.80	17.10
18.10					
IN	12.50	14.60	16.20	16.70	16.80
17.70					
IA	14.40	15.50	16.30	17.90	17.80
17.80					
KS	12.60	14.50	16.00	16.80	17.00
17.30					
KY	12.90	15.10	16.80	17.40	17.50
18.20					
LA	14.30	16.20	17.60	17.90	18.10
18.80					
MD	13.80	15.60	17.20	17.50	17.80
17.90					
MI	13.40	14.80	16.40	17.40	17.60
17.70					
MN	15.19	15.69	16.86	18.15	18.74
18.95					
MS	14.30	16.20	17.60	17.90	18.10
18.80					
MO	13.40	15.30	16.90	17.60	17.90
18.50					
NE	14.10	15.20	16.30	17.20	17.60
18.00					
NM	13.50	15.00	16.00	16.90	17.10
17.50					
NY	14.00	15.30	16.60	17.50	17.70
18.20					
NC	14.20	16.70	18.50	18.90	19.90
19.70					
ND	14.20	14.70	16.00	17.10	17.70
18.10					

OH	13.10	15.10	16.70	17.40	17.80	18.00
OK	13.80	15.20	16.70	17.30	17.80	18.60
OR	15.20	15.60	17.50	17.80	17.30	17.30
PA	13.80	15.60	17.20	18.00	18.00	18.30
TN	13.30	15.60	17.50	17.90	17.90	18.70
TX	13.50	15.60	17.20	17.60	17.90	18.20
UT	13.30	14.70	16.00	16.70	17.10	17.70
VT	14.80	15.90	17.30	17.90	17.70	18.00
VA	14.30	16.20	16.90	18.60	18.70	18.90
WA	14.60	15.60	17.50	17.80	17.30	17.30
WI	15.08	15.87	16.66	18.07	18.49	18.68
Year	United States					
1998	14.20	15.50	16.80	17.80	17.80	18.10
1997	12.20	12.80	13.10	14.10	14.70	14.80
1996	15.50	16.00	16.60	16.40	15.30	14.40
1995	12.10	12.50	12.80	13.40	14.00	14.00
1994	12.20	12.50	12.80	13.10	13.10	12.90
1993	12.80	12.50	12.80	13.10	13.60	13.60

1/ Includes surplus fluid grade milk diverted to manufacturing.

Milk, Sold to Plants, Eligible for Fluid Market 1/: Fat Test, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun

	:			Percent			
	:						
AL	:	3.75	3.70	3.62	3.59	3.57	3.63
AZ	:	3.66	3.63	3.59	3.57	3.51	3.50
AR	:	3.75	3.75	3.70	3.55	3.50	3.49
CA	:	3.82	3.83	3.72	3.68	3.62	3.57
CO	:	3.68	3.64	3.62	3.55	3.52	3.51
FL	:	3.62	3.64	3.58	3.49	3.50	3.51
GA	:	3.72	3.66	3.62	3.53	3.54	3.51
ID	:	3.62	3.58	3.56	3.54	3.47	3.36
IL	:	3.83	3.77	3.78	3.72	3.60	3.59
IN	:	3.79	3.76	3.74	3.64	3.54	3.55
IA	:	3.84	3.78	3.81	3.73	3.61	3.60
KS	:	3.82	3.72	3.76	3.62	3.49	3.49
KY	:	3.75	3.71	3.68	3.55	3.53	3.51
LA	:	3.51	3.46	3.43	3.38	3.40	3.44
MD	:	3.80	3.74	3.77	3.67	3.62	3.61
MI	:	3.74	3.70	3.70	3.64	3.55	352
MN	:	3.78	3.73	3.74	3.69	3.60	3.60
MS	:	3.63	3.62	3.57	3.51	3.53	3.56
MO	:	3.78	3.70	3.72	3.61	3.51	3.50
NE	:	3.81	3.74	3.79	3.71	3.57	3.57
NM	:	3.75	3.63	3.60	3.52	3.41	3.37
NY	:	3.73	3.73	3.74	3.69	3.62	3.57
NC	:	3.77	3.75	3.71	3.65	3.60	3.57
ND	:	3.79	3.71	3.73	3.68	3.55	3.52
OH	:	3.80	3.77	3.70	3.68	3.59	3.57
OK	:	3.75	3.61	3.62	3.54	3.42	3.40

OR	3.78	3.67	3.65	3.64	3.57	3.57
PA	3.73	3.71	3.71	3.65	3.59	3.56
TN	3.77	3.75	3.70	3.57	3.50	3.50
TX	3.74	3.66	3.64	3.52	3.46	3.43
UT	3.72	3.66	3.64	3.58	3.54	3.49
VT	3.79	3.77	3.77	3.72	3.66	3.61
VA	3.73	3.74	3.71	3.61	3.57	3.52
WA	3.77	3.78	3.67	3.64	3.57	3.57
WI	3.82	3.79	3.80	3.75	3.65	3.61
Year	United States					
1998	3.77	3.74	3.71	3.65	3.58	3.55
1997	3.77	3.73	3.68	3.65	3.59	3.53
1996	3.80	3.78	3.74	3.69	3.62	3.56
1995	3.76	3.72	3.69	3.65	3.60	3.53
1994	3.79	3.75	3.70	3.64	3.59	3.53
1993	3.78	3.73	3.71	3.65	3.57	3.53

continued

Milk, Sold to Plants, Eligible for Fluid Market 1/: Fat Test, Monthly, by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec
	Percent					

AL	:	3.61	3.64	3.65	3.67	3.76
3.71						
AZ	:	3.49	3.46	3.45	3.58	3.67
3.70						
AR	:	3.45	3.53	3.55	3.58	3.72
3.73						
CA	:	3.52	3.47	3.52	3.68	3.70
3.79						
CO	:	3.47	3.53	3.57	3.71	3.77
3.83						
FL	:	3.57	3.61	3.59	3.62	3.62
3.60						
GA	:	3.49	3.51	3.56	3.63	3.77
3.70						
ID	:	3.46	3.42	3.58	3.67	3.73
3.75						
IL	:	3.51	3.54	3.56	3.74	3.84
3.82						
IN	:	3.46	3.51	3.57	3.74	3.84
3.83						
IA	:	3.53	3.56	3.65	3.83	3.89
3.86						
KS	:	3.46	3.49	3.57	3.70	3.82
3.77						
KY	:	3.47	3.49	3.54	3.64	3.75
3.75						
LA	:	3.45	3.45	3.50	3.51	3.54
3.53						
MD	:	3.54	3.56	3.60	3.72	3.85
3.80						
MI	:	3.43	3.45	3.53	3.73	3.83
3.82						
MN	:	3.55	3.57	3.64	3.80	3.84
3.80						
MS	:	3.58	3.59	3.64	3.66	3.69
3.67						
MO	:	3.47	3.51	3.57	3.68	3.76
3.77						
NE	:	3.54	3.54	3.57	3.76	3.85
3.81						
NM	:	3.33	3.37	3.40	3.50	3.65
3.67						
NY	:	3.52	3.53	3.59	3.72	3.80
3.75						
NC	:	3.52	3.55	3.61	3.70	3.80
3.79						
ND	:	3.46	3.48	3.60	3.79	3.83
3.80						
OH	:	3.53	3.55	3.62	3.73	3.86
3.87						
OK	:	3.35	3.42	3.48	3.62	3.73
3.68						
OR	:	3.56	3.50	3.60	3.73	3.76
3.77						

PA	3.55	3.53	3.54	3.72	3.81
3.78					
TN	3.52	3.54	3.59	3.68	3.77
3.77					
TX	3.41	3.44	3.51	3.58	3.71
3.71					
UT	3.46	3.52	3.57	3.69	3.76
3.80					
VT	3.58	3.56	3.62	3.72	3.80
3.77					
VA	3.50	3.46	3.57	3.69	3.70
3.78					
WA	3.56	3.50	3.60	3.73	3.76
3.77					
WI	3.54	3.56	3.63	3.82	3.87
3.84					
Year	United States				
1998	3.51	3.51	3.57	3.71	3.78
3.78					
1997	3.51	3.52	3.58	3.70	3.79
3.80					
1996	3.55	3.56	3.64	3.73	3.78
3.77					
1995	3.49	3.49	3.59	3.72	3.80
3.81					
1994	3.50	3.53	3.60	3.69	3.76
3.78					
1993	3.51	3.52	3.60	3.72	3.79
3.79					

1/ Includes surplus fluid grade milk diverted to manufacturing.

Milk, Sold to Plants, Manufacturing Grade: Prices Received, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
CA	14.71	13.85	13.20	12.39	12.13	13.91
ID	13.38	13.59	12.85	11.82	11.07	13.23

IL	:	14.00	14.10	13.60	12.70	11.80
13.50						
IN	:	12.60	12.60	12.20	11.30	11.20
11.50						
IA	:	13.70	13.60	13.00	12.10	11.00
13.20						
KS	:	13.40	13.40	12.90	12.00	10.80
12.30						
KY	:	12.70	12.70	12.10	11.50	10.50
12.40						
MI	:	12.50	12.60	12.20	11.30	10.00
11.80						
MN	:	13.50	13.48	12.92	11.99	11.05
13.04						
MO	:	13.70	13.60	12.70	12.00	10.70
13.00						
NE	:	13.70	13.80	13.30	12.40	11.00
13.20						
NC	:	13.00	13.00	12.30	11.30	10.70
12.30						
ND	:	12.80	12.70	12.40	11.70	11.10
12.00						
OH	:	12.20	12.40	12.00	11.60	11.40
12.30						
OR	:	14.40	14.50	13.80	12.70	11.90
14.80						
PA	:	13.50	13.50	13.10	12.00	11.20
13.30						
TN	:	12.70	12.80	12.20	11.30	10.40
12.40						
UT	:	13.00	13.20	12.40	11.80	10.90
12.40						
VA	:	14.50	14.90	14.70	14.70	14.20
13.40						
WI	:	13.87	13.79	13.32	12.38	11.65
13.67						

Year	:	United States				
1998	:	13.50	13.50	12.90	12.10	11.30
13.10						
1997	:	12.10	12.50	12.40	11.60	10.90
10.80						
1996	:	12.80	12.60	12.60	12.90	13.40
13.60						
1995	:	11.40	11.70	11.70	11.20	11.00
11.10						
1994	:	12.30	12.20	12.40	12.50	11.40
11.00						
1993	:	11.10	10.90	11.20	12.00	12.30
11.90						

continued

Milk, Sold to Plants, Manufacturing Grade: Prices Received, Monthly, by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
CA	15.07	15.77	16.90	18.32	18.65	19.01
ID	14.08	14.38	15.57	17.52	18.22	18.54
IL	14.80	15.30	15.90	17.60	18.00	18.30
IN	12.00	14.20	13.70	14.40	15.20	15.40
IA	14.10	14.90	15.00	15.90	16.60	16.40
KS	13.90	14.20	14.60	16.50	16.70	17.00
KY	12.90	14.20	14.80	15.60	15.40	16.00
MI	14.00	14.70	14.80	16.40	17.20	17.30
MN	14.08	14.54	15.45	16.95	17.53	17.70
MO	14.40	15.10	15.60	16.20	17.00	16.70
NE	14.70	14.90	15.30	17.00	17.60	17.80
NC	13.10	14.60	15.10	16.40	17.40	17.30
ND	12.50	13.00	13.80	15.00	15.60	16.00
OH	13.00	13.20	14.00	14.60	15.20	15.50
OR	14.70	14.60	15.20	18.20	19.30	19.60
PA	14.60	14.90	15.60	16.70	17.40	17.60
TN	12.80	14.30	14.80	15.80	16.00	16.10

UT	13.80	14.60	15.20	16.50	17.10
17.30					
VA	12.20	14.40	16.10	16.00	15.80
15.00					
WI	14.56	15.03	15.89	17.60	18.02
17.96					
Year	United States				
1998	14.10	14.60	15.40	16.80	17.30
17.40					
1997	10.80	11.90	12.70	13.20	13.60
13.60					
1996	14.00	14.60	15.30	14.60	12.40
11.80					
1995	11.00	11.30	12.10	12.80	13.10
12.90					
1994	11.10	11.40	11.90	12.20	12.00
11.50					
1993	11.20	11.00	11.90	12.40	12.70
12.50					

Milk, Sold to Plants, Manufacturing Grade: Fat Test, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun
	Percent					
CA	4.22	4.16	3.99	4.00	3.94	3.87
ID	3.86	3.75	3.70	3.64	3.58	3.53
IL	3.88	3.83	3.85	3.76	3.62	3.60
IN	3.86	3.83	3.81	3.69	3.53	3.52
IA	3.93	3.83	3.86	3.77	3.66	3.59
KS	3.95	3.80	3.86	3.68	3.58	3.46
KY	3.88	3.82	3.74	3.63	3.58	3.58

MI	: 3.82	3.76	3.79	3.73	3.55	3.46
MN	: 3.83	3.78	3.78	3.72	3.59	3.56
MO	: 3.98	3.84	3.84	3.62	3.57	3.63
NE	: 3.94	3.84	3.90	3.76	3.51	3.54
NC	: 4.05	4.04	3.90	3.84	3.78	3.83
ND	: 3.82	3.75	3.76	3.68	3.53	3.53
OH	: 3.85	3.84	3.83	3.75	3.69	3.58
OR	: 4.50	4.35	4.28	4.26	4.08	4.12
PA	: 3.88	3.83	3.93	3.93	3.86	3.65
TN	: 3.90	3.86	3.74	3.64	3.59	3.59
UT	: 3.85	3.77	3.73	3.69	3.60	3.56
VA	: 4.05	4.16	4.21	4.04	3.90	3.92
WI	: 3.91	3.87	3.89	3.84	3.72	3.67
Year	:		United States			
1998	: 391	3.86	3.85	3.78	3.67	3.63
1997	: 3.93	3.87	3.84	3.79	3.72	3.60
1996	: 3.93	3.88	3.85	3.78	3.74	3.63
1995	: 3.88	3.83	3.80	3.76	3.71	3.60
1994	: 3.93	3.87	3.81	3.75	3.66	3.57
1993	: 3.89	3.83	3.82	3.76	3.68	3.63

continued

Milk, Sold to Plants, Manufacturing Grade: Fat Test, Monthly, by States, 1998; United States, 1993-98, continued

:	:	:	:	:	:

State	Jul	Aug	Sep	Oct	Nov	Dec
			Percent			
CA	3.84	3.84	3.94	4.05	4.13	4.28
ID	3.47	3.50	3.73	3.88	3.89	3.93
IL	3.48	3.50	3.57	3.73	3.77	3.76
IN	3.44	3.54	3.61	3.79	3.95	3.98
IA	3.51	3.54	3.67	3.89	4.02	3.95
KS	3.42	3.49	3.54	3.77	3.89	3.90
KY	3.55	3.60	3.78	3.93	3.87	3.95
MI	3.45	3.48	3.52	3.75	3.90	3.85
MN	3.51	3.53	3.63	3.86	3.91	3.80
MO	3.59	3.63	3.73	3.83	3.94	3.94
NE	3.45	3.48	3.56	3.82	3.94	3.89
NC	3.64	3.92	3.92	4.16	4.18	4.00
ND	3.49	3.51	3.62	3.83	3.90	3.88
OH	3.60	3.62	3.69	3.81	3.87	3.94
OR	3.89	3.80	4.01	4.34	4.16	4.40
PA	3.57	3.53	3.61	3.66	3.84	3.86
TN	3.57	3.59	3.77	3.93	3.96	3.95
UT	3.47	3.52	3.67	3.81	3.84	3.84
VA	3.79	3.80	3.97	3.95	3.97	4.24
WI	3.58	3.62	3.71	3.95	4.01	3.96
Year			United States			
1998	3.56	3.59	3.69	3.89	3.96	3.93

1997	3.58	3.62	3.73	3.86	3.98
3.96					
1996	3.57	3.59	3.71	3.85	3.95
3.94					
1995	3.56	3.57	3.70	3.87	3.94
3.94					
1994	3.57	3.61	3.73	3.86	3.93
3.95					
1993	3.60	3.60	3.74	3.88	3.96
3.94					

Milk, Sold to Plants, All: Prices Received, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun
	Dollars per Cwt					
AL	16.10	16.20	16.00	15.90	15.40	15.10
AZ	14.30	14.50	14.10	13.60	12.50	13.50
AR	15.00	15.30	15.00	14.70	14.00	14.20
CA	13.58	14.03	13.39	13.14	12.95	13.94
CO	14.30	14.50	14.40	13.90	13.00	13.60
FL	17.40	17.70	17.30	17.00	16.70	16.80
GA	16.00	16.40	16.30	16.40	15.90	15.10
ID	13.40	13.70	13.00	12.30	11.30	13.40
IL	14.90	15.10	14.70	14.20	13.10	13.90
IN	14.40	14.60	14.40	14.10	13.50	13.40
IA	15.60	14.70	14.50	13.50	12.60	14.30
KS	14.40	14.50	14.30	13.50	12.50	13.40
KY	15.00	15.30	15.10	14.70	14.30	14.10

LA	:	15.40	15.70	15.70	15.70	15.30
15.00						
MD	:	14.90	15.30	15.00	14.90	14.40
14.50						
MI	:	14.70	15.10	14.80	14.50	13.80
13.80						
MN	:	14.83	14.84	14.28	13.41	12.47
14.22						
MS	:	15.40	15.70	15.70	15.70	15.30
15.00						
MO	:	15.10	15.30	15.00	15.00	13.60
14.00						
NE	:	14.40	14.70	14.50	13.60	12.70
13.60						
NM	:	14.10	14.10	13.70	13.10	12.70
13.40						
NY	:	14.70	14.90	14.70	14.20	13.40
14.00						
NC	:	16.30	16.70	16.50	16.30	15.70
15.40						
ND	:	13.90	13.80	13.40	13.10	11.90
13.00						
OH	:	14.70	14.80	14.80	14.40	13.60
13.40						
OK	:	15.10	15.30	14.80	14.50	13.50
14.00						
OR	:	14.20	14.60	14.50	14.00	13.50
14.70						
PA	:	15.30	15.50	15.40	15.20	14.10
14.40						
TN	:	15.40	15.80	15.60	14.90	14.70
14.50						
TX	:	15.40	15.40	14.70	14.60	14.00
14.10						
UT	:	13.80	14.00	13.10	12.90	12.50
13.10						
VT	:	15.20	15.20	15.20	14.90	14.60
15.10						
VA	:	15.90	16.60	15.80	15.90	15.40
15.20						
WA	:	14.30	14.20	14.60	14.00	13.50
14.40						
WI	:	14.75	14.75	14.31	13.47	12.40
14.26						

Year	:	United States				
1998	:	14.60	14.80	14.40	14.00	13.30
14.10						
1997	:	13.50	13.40	13.60	13.20	12.70
12.20						

1996	14.10	13.90	13.80	13.90	14.30
14.80					
1995	12.60	12.50	12.60	12.30	12.30
12.10					
1994	13.60	13.40	13.50	13.40	12.80
12.60					
1993	12.50	12.20	12.20	12.60	12.90
13.00					

continued

Milk, Sold to Plants, All: Prices Received, Monthly, by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
AL	14.50	16.50	18.00	18.20	18.40	19.00
AZ	13.80	15.10	16.00	16.80	16.30	15.60
AR	13.60	15.60	17.00	17.40	17.60	18.40
CA	14.40	15.62	16.68	18.08	17.24	17.19
CO	13.10	15.00	16.30	17.20	17.50	18.00
FL	15.90	18.30	20.00	20.20	20.70	21.30
GA	13.80	16.20	17.90	18.10	18.20	19.10
ID	14.10	14.40	15.60	16.70	17.70	17.80
IL	13.70	14.90	15.70	16.80	17.10	18.10
IN	12.40	14.60	16.10	16.60	16.70	17.60
IA	14.40	15.40	16.20	17.80	17.70	17.70
KS	12.60	14.50	16.00	16.80	17.00	17.30
KY	12.90	15.10	16.80	17.40	17.50	18.20

LA	:	14.30	16.20	17.60	17.90	18.10
18.80						
MD	:	13.80	15.60	17.20	17.50	17.80
17.90						
MI	:	13.40	14.80	16.40	17.40	17.60
17.70						
MN	:	15.11	15.61	16.76	18.07	18.66
18.86						
MS	:	14.30	16.20	17.60	17.90	18.10
18.80						
MO	:	13.50	15.30	16.80	17.50	17.90
18.40						
NE	:	14.10	15.20	16.20	17.20	17.60
18.00						
NM	:	13.50	15.00	16.00	16.90	17.10
17.50						
NY	:	14.00	15.30	16.60	17.50	17.70
18.20						
NC	:	14.20	16.70	18.50	18.90	19.90
19.70						
ND	:	13.60	14.10	15.20	16.40	17.00
17.40						
OH	:	13.10	14.90	16.50	17.20	17.60
17.80						
OK	:	13.80	15.20	16.70	17.30	17.80
18.60						
OR	:	15.20	15.60	17.50	17.80	17.30
17.30						
PA	:	13.80	15.60	17.10	18.00	18.00
18.30						
TN	:	13.30	15.60	17.50	17.90	17.90
18.70						
TX	:	13.50	15.60	17.20	17.60	17.90
18.20						
UT	:	13.30	14.60	15.90	16.70	17.10
17.60						
VT	:	14.80	15.90	17.30	17.90	17.70
18.00						
VA	:	14.30	16.20	16.90	18.60	18.70
15.80						
WA	:	14.60	15.60	17.50	17.80	17.30
17.30						
WI	:	15.05	15.81	16.61	18.04	18.46
18.64						

Year	:	United States				
1998	:	14.20	15.50	16.70	17.70	17.80
18.00						
1997	:	12.10	12.70	13.10	14.10	14.70
14.80						

1996	15.40	15.90	16.50	16.40	15.20	14.30
1995	12.00	12.40	12.80	13.40	14.00	13.90
1994	12.20	12.40	12.80	13.00	13.10	12.80
1993	12.80	12.40	12.80	13.10	13.60	13.50

Milk, Sold to Plants, All: Fat Test, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun
			Percent			
AL	3.75	3.70	3.62	3.59	3.57	3.63
AZ	3.66	3.63	3.59	3.57	3.51	3.50
AR	3.75	3.75	3.70	3.55	3.50	3.49
CA	3.83	3.84	3.72	3.69	3.63	3.58
CO	3.68	3.64	3.62	3.55	3.52	3.51
FL	3.62	3.64	3.58	3.49	3.50	3.51
GA	3.72	3.66	3.62	3.53	3.54	3.51
ID	3.63	3.59	3.57	3.54	3.47	3.37
IL	3.83	3.77	3.78	3.72	3.60	3.59
IN	3.79	3.76	374	3.64	3.54	3.54
IA	3.84	3.79	3.81	3.74	3.62	3.60
KS	3.82	3.74	3.76	3.62	3.49	3.49
KY	3.75	3.71	3.68	3.55	3.53	3.51
LA	3.51	3.46	3.43	3.38	3.40	3.44
MD	3.80	3.74	3.77	3.67	3.62	3.61

MI	:	3.74	3.70	3.70	3.64	3.55
3.52						
MN	:	3.78	3.73	3.74	3.69	3.60
3.60						
MS	:	3.63	3.62	3.57	3.51	3.53
3.56						
MO	:	3.79	3.71	3.73	3.61	3.51
3.51						
NE	:	3.82	3.75	3.80	3.71	3.57
3.57						
NM	:	3.75	3.63	3.60	6.80	
GA	:	16.00	16.40	16.30	16.40	15.90
15.10						
ID	:	13.40	13.70	13.00	12.30	11.30
13.40						
IL	:	14.90	15.10	14.70	14.20	13.10
13.90						
IN	:	14.40	14.60	14.40	14.10	13.50
13.40						
IA	:	15.60	14.70	14.50	13.50	12.60
14.30						
KS	:	14.40	14.50	14.30	13.50	12.50
13.40						
KY	:	15.00	15.30	15.10	14.70	14.30
14.10						
LA	:	15.40	15.70	15.70	15.70	15.30
15.00						
MD	:	14.90	15.30	15.00	14.90	14.40
14.50						
MI	:	14.70	15.10	14.80	14.50	13.80
13.80						
MN	:	14.83	14.84	14.28	13.41	12.47
14.22						
MS	:	15.40	15.70	15.70	15.70	15.30
15.00						
MO	:	15.10	15.30	15.00	15.00	13.60
14.00						
NE	:	14.40	14.70	14.50	13.60	12.70
13.60						
NM	:	14.10	14.10	13.70	13.10	12.70
13.40						
NY	:	14.70	14.90	14.70	14.20	13.40
14.00						
NC	:	16.30	16.70	16.50	16.30	15.70
15.40						
ND	:	13.90	13.80	13.40	13.10	11.90
13.00						
OH	:	14.70	14.80	14.80	14.40	13.60
13.40						
OK	:	15.10	15.30	14.80	14.50	13.50
14.00						
OR	:	14.20	14.60	14.50	14.00	13.50
14.70						

PA	15.30	15.50	15.40	15.20	14.10
14.40					
TN	15.40	15.80	15.60	14.90	14.70
14.50					
TX	15.40	15.40	14.70	14.60	14.00
14.10					
UT	13.80	14.00	13.10	12.90	12.50
13.10					
VT	15.20	15.20	15.20	14.90	14.60
15.10					
VA	15.90	16.60	15.80	15.90	15.40
15.20					
WA	14.30	14.20	14.60	14.00	13.50
14.40					
WI	14.75	14.75	14.31	13.47	12.40
14.26					
Year	United States				
1998	14.60	14.80	14.40	14.00	13.30
14.10					
1997	13.50	13.40	13.60	13.20	12.70
12.20					
1996	14.10	13.90	13.80	13.90	14.30
14.80					
1995	12.60	12.50	12.60	12.30	12.30
12.10					
1994	13.60	13.40	13.50	13.40	12.80
12.60					
1993	12.50	12.20	12.20	12.60	12.90
13.00					

continued

Milk, Sold to Plants, All: Prices Received, Monthly, by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt					
AL	14.50	16.50	18.00	18.20	18.40	19.00

AZ	:	13.80	15.10	16.00	16.80	16.30
15.60						
AR	:	13.60	15.60	17.00	17.40	17.60
18.40						
CA	:	14.40	15.62	16.68	18.08	17.24
17.19						
CO	:	13.10	15.00	16.30	17.20	17.50
18.00						
FL	:	15.90	18.30	20.00	20.20	20.70
21.30						
GA	:	13.80	16.20	17.90	18.10	18.20
19.10						
ID	:	14.10	14.40	15.60	16.70	17.70
17.80						
IL	:	13.70	14.90	15.70	16.80	17.10
18.10						
IN	:	12.40	14.60	16.10	16.60	16.70
17.60						
IA	:	14.40	15.40	16.20	17.80	17.70
17.70						
KS	:	12.60	14.50	16.00	16.80	17.00
17.30						
KY	:	12.90	15.10	16.80	17.40	17.50
18.20						
LA	:	14.30	16.20	17.60	17.90	18.10
18.80						
MD	:	13.80	15.60	17.20	17.50	17.80
17.90						
MI	:	13.40	14.80	16.40	17.40	17.60
17.70						
MN	:	15.11	15.61	16.76	18.07	18.66
18.86						
MS	:	14.30	16.20	17.60	17.90	18.10
18.80						
MO	:	13.50	15.30	16.80	17.50	17.90
18.40						
NE	:	14.10	15.20	16.20	17.20	17.60
18.00						
NM	:	13.50	15.00	16.00	16.90	17.10
17.50						
NY	:	14.00	15.30	16.60	17.50	17.70
18.20						
NC	:	14.20	16.70	18.50	18.90	19.90
19.70						
ND	:	13.60	14.10	15.20	16.40	17.00
17.40						
OH	:	13.10	14.90	16.50	17.20	17.60
17.80						
OK	:	13.80	15.20	16.70	17.30	17.80
18.60						
OR	:	15.20	15.60	17.50	17.80	17.30
17.30						
PA	:	13.80	15.60	17.10	18.00	18.00
18.30						

TN	13.30	15.60	17.50	17.90	17.90
18.70					
TX	13.50	15.60	17.20	17.60	17.90
18.20					
UT	13.30	14.60	15.90	16.70	17.10
17.60					
VT	14.80	15.90	17.30	17.90	17.70
18.00					
VA	14.30	16.20	16.90	18.60	18.70
15.80					
WA	14.60	15.60	17.50	17.80	17.30
17.30					
WI	15.05	15.81	16.61	18.04	18.46
18.64					
Year	United States				
1998	14.20	15.50	16.70	17.70	17.80
18.00					
1997	12.10	12.70	13.10	14.10	14.70
14.80					
1996	15.40	15.90	16.50	16.40	15.20
14.30					
1995	12.00	12.40	12.80	13.40	14.00
13.90					
1994	12.20	12.40	12.80	13.00	13.10
12.80					
1993	12.80	12.40	12.80	13.10	13.60
13.50					

Milk, Sold to Plants, All: Fat Test, Monthly, by States, 1998; United States, 1993-98

State	Jan	Feb	Mar	Apr	May	Jun
	Percent					
AL	3.75	3.70	3.62	3.59	3.57	3.63
AZ	3.66	3.63	3.59	3.57	3.51	3.50
AR	3.75	3.75	3.70	3.55	3.50	3.49

CA	:	3.83	3.84	3.72	3.69	3.63	3.58
CO	:	3.68	3.64	3.62	3.55	3.52	3.51
FL	:	3.62	3.64	3.58	3.49	3.50	3.51
GA	:	3.72	3.66	3.62	3.53	3.54	3.51
ID	:	3.63	3.59	3.57	3.54	3.47	3.37
IL	:	3.83	3.77	3.78	3.72	3.60	3.59
IN	:	3.79	3.76	374	3.64	3.54	3.54
IA	:	3.84	3.79	3.81	3.74	3.62	3.60
KS	:	3.82	3.74	3.76	3.62	3.49	3.49
KY	:	3.75	3.71	3.68	3.55	3.53	3.51
LA	:	3.51	3.46	3.43	3.38	3.40	3.44
MD	:	3.80	3.74	3.77	3.67	3.62	3.61
MI	:	3.74	3.70	3.70	3.64	3.55	3.52
MN	:	3.78	3.73	3.74	3.69	3.60	3.60
MS	:	3.63	3.62	3.57	3.51	3.53	3.56
MO	:	3.79	3.71	3.73	3.61	3.51	3.51
NE	:	3.82	3.75	3.80	3.71	3.57	3.57
NM	:	3.75	3.63	3.60	3.52	3.41	3.37
NY	:	3.73	3.73	3.74	3.69	3.62	3.57
NC	:	3.77	3.75	3.71	3.65	3.60	3.57
ND	:	3.80	3.73	3.74	3.68	3.54	3.53
OH	:	3.80	3.78	3.71	3.69	3.60	3.57
OK	:	3.75	3.61	3.62	3.54	3.42	3.40
OR	:	3.79	3.68	3.66	3.65	3.56	3.57
PA	:	3.73	3.72	3.71	3.65	3.60	3.56
TN	:	3.77	3.75	3.70	3.57	3.50	3.50
TX	:	3.74	3.66	3.64	3.52	3.46	3.43
UT	:	3.74	3.67	3.65	359	3.55	3.50

VT	3.79	3.77	3.77	3.72	3.66	3.61
VA	3.74	3.75	3.72	3.62	3.57	3.53
WA	3.77	3.78	3.67	3.64	3.57	3.57
WI	3.82	3.79	3.80	3.76	3.66	3.62
Year	United States					
1998	3.77	3.74	3.71	3.66	3.58	3.55
1997	3.79	3.74	3.70	3.66	3.61	3.55
1996	3.80	3.78	3.74	3.69	3.62	3.57
1995	3.77	3.72	3.70	3.65	3.61	3.54
1994	3.80	3.76	3.70	3.64	3.59	3.53
1993	3.79	3.74	3.71	3.65	3.58	3.54

continued

Milk, Sold to Plants, All: Fat Test, Monthly, by States, 1998; United States, 1993-98, continued

State	Jul	Aug	Sep	Oct	Nov	Dec
	Percent					
AL	3.61	3.64	3.65	3.67	3.76	3.71
AZ	3.49	3.46	3.45	3.58	3.67	3.70
AR	3.45	3.53	3.55	3.58	3.72	3.73
CA	3.53	3.48	3.53	3.68	3.70	3.80
CO	3.47	3.53	3.57	3.71	3.77	3.83

FL	:	3.57	3.61	3.59	3.62	3.62
3.60						
GA	:	3.49	3.51	3.56	3.63	3.77
3.70						
ID	:	3.46	3.42	3.58	3.68	3.73
3.76						
IL	:	3.51	3.54	3.56	3.74	3.84
3.82						
IN	:	3.46	3.51	3.57	3.74	3.85
3.84						
IA	:	3.53	3.56	3.65	3.84	3.90
3.87						
KS	:	3.46	3.49	3.57	3.70	3.82
3.77						
KY	:	3.47	3.49	3.54	3.65	3.75
3.75						
LA	:	3.45	3.45	3.50	3.51	3.54
3.53						
MD	:	3.54	3.56	3.60	3.72	3.85
3.80						
MI	:	3.43	3.45	3.53	3.73	3.83
3.82						
MN	:	3.55	3.57	3.64	3.80	3.84
3.80						
MS	:	3.58	3.59	3.64	3.66	3.69
3.67						
MO	:	3.48	3.52	3.58	3.69	3.77
3.77						
NE	:	3.53	3.54	3.57	3.76	3.85
3.81						
NM	:	3.33	3.37	3.40	3.50	3.65
3.67						
NY	:	3.52	3.53	3.59	3.72	3.80
3.75						
NC	:	3.52	3.55	3.61	3.70	3.80
3.79						
ND	:	3.47	3.49	3.60	3.81	3.85
3.83						
OH	:	3.53	3.56	3.62	3.73	3.86
3.87						
OK	:	3.35	3.42	3.48	3.62	3.73
3.68						
OR	:	3.56	3.50	3.60	3.74	3.76
3.78						
PA	:	3.56	3.53	3.54	3.72	3.81
3.78						
TN	:	3.52	3.54	3.59	3.68	3.77
3.77						
TX	:	3.41	3.44	3.51	3.58	3.71
3.71						
UT	:	3.46	3.52	3.58	3.70	3.77
3.80						
VT	:	3.58	3.56	3.62	3.72	3.80
3.77						

VA	3.50	3.47	3.57	3.69	3.70	3.78
WA	3.56	3.50	3.60	3.73	3.76	3.77
WI	3.54	3.57	3.63	3.83	3.88	3.85
Year	United States					
1998	3.51	3.51	3.57	3.72	3.78	3.79
1997	3.52	3.54	3.60	3.71	3.80	3.82
1996	3.55	3.56	3.64	3.74	3.78	3.78
1995	3.49	3.50	3.60	3.72	3.80	3.81
1994	3.50	3.53	3.61	3.70	3.77	3.79
1993	3.51	3.52	3.61	3.72	3.80	3.80

Annual Summary of Prices Paid

Agricultural Inputs: The Index of Prices Paid by Farmers measures changes in the prices paid for goods and services used in crop and livestock production and family living. The index is made up of 5 major components. In terms of total farm expenditures, the production component accounts for over 67 percent of the total and the family living component represented by the Bureau of Labor Statistics' Consumer Price Index (CPI-U) accounts for less than 18 percent of the index. The remaining three components are: (1) interest charges per acre on farm real estate debt and interest on farm non-real estate debt; (2) taxes payable per acre on farm real estate; and (3) wage rates paid to hired farm labor. Prices Paid Indexes are not seasonally adjusted and there are no adjustments for quality changes.

The 1910-14=100 base is required under the Agricultural Adjustment Act of 1938, as amended. The Index of Prices Paid by Farmers for Commodities and Services,

Interest, Taxes, and Farm Wage Rates on the 1910-14=100 base is called the Parity Index. The Parity Index reflects relative price change but does not take into account the technological advancements and increased productivity of American agriculture. Federal regulations require that the National Agricultural Statistics Service publish parity prices, the indexes, and relevant price data monthly in "Agricultural Prices".

In 1995, the National Agricultural Statistics Service reweighted and reconstructed the prices paid and received by farmers indexes. The indexes are now based on 5-year moving average weights. The changes in the construction of the indexes simplifies updating component items and reference periods while maintaining appropriate weights. The overall changes to the weighting and construction of the indexes did not have a significant effect on the index levels, and therefore, had little effect on the level of parity prices. Indexes are newly published on a 1990-92=100 base using a 1990-92 reference period. As mentioned above, the 1910-14=100 base is continued for the parity index.

Beginning 1995, the Prices Paid Survey of items purchased by farm establishments is conducted annually in April. Surveys are conducted for feed, livestock purchases, seed, fertilizer, ag chemicals, fuel, and farm machinery. The Bureau of Labor Statistics, (BLS) indexes measure price changes and replace survey activity for farm supplies and repairs, autos and trucks, building materials, and marketing containers. The BLS indexes are used monthly to measure price change when no survey data are collected. Before 1995, quarterly prices paid surveys were conducted by NASS. About 135 selected items are priced to represent groups of similar items purchased which make up the major production expenditures categories. The number of input items consumed on farms is so extensive that it is not feasible to collect price data for all of the inputs.

Items on the questionnaire are described in the simplest way consistent with

definite identification. Firms are requested to report the prices for the item most commonly sold which meets the general specification criteria. Reported data are summarized to regional estimates and then weighted to U.S. prices. Weights are based on available consumption or expenditure information. Average prices including state and local taxes are used in computing the indexes and are published in Agricultural Prices in the same month as the survey. Regional prices are published for feed, fuel, and fertilizer. U.S. prices are published for the remaining items surveyed.

Revisions: Indexes are recomputed monthly to reflect the most recent price changes and include any updated prices or indexes. Prices Paid Indexes including all components and subcomponents are subject to annual revisions as additional data become available. In April, index revisions published reflect yearly change for items surveyed annually by the Prices Paid Survey and adjusted BLS indexes used for the one month time lag between the reporting and summary date. Annual revisions generally are made in the taxes, interest, and rent, and farm services components of the index.

Parity Ratio: The Parity Ratio is the ratio of the Prices Received Index, 1910-14=100, to the Index of Prices Paid by Farmers for Commodities and Services, Interest, Taxes, and Wage Rates on a 1910-14=100 base. The Parity Ratio is a measure of price relationships; not a measure of farm income, of farmer's total purchasing power, or of farmer's welfare. The well-being of the farm community depends upon a number of factors other than price relationships such as changes in production efficiency and technology, quantities of farm products sold, and supplementary income, including income from off-farm jobs, and federal farm programs.

Ratio: The ratio of the Prices Received Index to the Prices Paid Index on the

1990-92 base provides an indication of the change that has occurred in the prices farmers receive for their commodities relative to the change in the cost of inputs using the average of 1990-92 as the reference period. When this ratio is greater than 100 percent, it implies that farm commodity prices have increased at a faster rate than farm input prices. When the ratio is less than 100 percent, farm input prices are increasing at a more rapid pace than farm commodity prices.

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Commodities and Services, Interest, Taxes, and Wage Rates (PPITW)													
1910-14 = 100													
1991	1346			1339			1320			1331			1334
1992	1345			1346			1349			1350			1348
1993	1369			1384			1381			1391			1381
1994	1416			1427			1413			1409			1416
1995	1444	1443	1446	1447	1447	1451	1453	1454	1457	1462	1467	1479	1454
1996	1507	1508	1515	1528	1539	1538	1540	1543	1545	1538	1535	1537	1531
1997	1559	1564	1571	1577	1583	1578	1572	1574	1582	1579	1582	1581	1575
1998	1582	1579	1569	1565	1563	1557	1550	1541	1529	1540	1542	1538	1555
1990-92 = 100													

1991 : 101 101 99 100
100
1992 : 101 101 101 101
101
1993 : 103 104 104 104
104
1994 : 106 107 106 106
106
1995 : 108 108 109 109 109 109 109 109 109 110 110
111 109
1996 : 113 113 114 115 116 115 116 116 116 115 115
115 115
1997 : 117 117 118 118 119 119 118 118 119 119 119
119 118
1998 : 119 119 118 118 117 117 116 116 115 116 116
116 117

Items Used for Production, Interest, Taxes, and Wage Rates (PITW)

1910-14 = 100

1991 :1366 1353 1329 1339
1347
1992 :1355 1351 1353 1352
1353
1993 :1372 1388 1383 1392
1384
1994 :1423 1434 1414 1407
1419
1995 :1448 1445 1448 1448 1447 1451 1454 1454 1457 1462 1469
1484 1456
1996 :1516 1516 1524 1537 1551 1549 1552 1554 1556 1546 1541
1544 1540
1997 :1570 1575 1583 1589 1597 1591 1583 1584 1593 1589 1593
1592 1586
1998 :1592 1588 1576 1570 1567 1559 1550 1539 1524 1536 1538
1534 1556

1990-92 = 100

1991 : 102 101 99 100
100
1992 : 101 101 101 101
101
1993 : 102 103 103 104
103
1994 : 106 107 105 105
106
1995 : 108 108 108 108 108 108 108 108 108 109 109
110 108
1996 : 113 113 113 114 115 115 115 116 116 115 115
115 115

1997 : 117 117 118 118 119 118 118 118 119 118 119
118 118
1998 : 119 118 117 117 117 116 115 115 113 114 115
114 116

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Items Used for Production													
1910-14 = 100													
1991	987	978	961	964	973								
1992	976	978	983	978	979								
1993	993	1008	1009	1013	1006								
1994	1030	1042	1028	1018	1030								
1995	1042	1040	1042	1047	1046	1050	1047	1047	1050	1057	1063	1077	1051
1996	1094	1095	1102	1116	1128	1127	1132	1135	1136	1120	1116	1118	1118
1997	1135	1140	1146	1155	1162	1156	1152	1153	1161	1150	1154	1152	1151
1998	1144	1140	1129	1126	1123	1116	1113	1103	1090	1094	1096	1093	1114
1990-92 = 100													
1991	101	101	99	99	100								
1992	100	101	101	101	101								
1993	102	104	104	104	104								
1994	106	107	106	105	106								

1995 : 107 107 107 108 108 108 108 108 108 109 110
111 108
1996 : 113 113 114 115 116 116 117 117 117 115 115
115 115
1997 : 117 117 118 119 120 119 119 119 120 119 119
119 119
1998 : 118 117 116 116 116 115 115 114 112 113 113
113 115
:
: Feed
:
: 1910-14 = 100
:
1991 : 481 491 468 480
480
1992 : 488 493 486 471
485
1993 : 487 488 504 508
497
1994 : 547 536 508 481
518
1995 : 472 466 475 488 483 484 493 501 508 528 552
579 502
1996 : 593 599 609 638 673 670 683 678 660 604 583
584 631
1997 : 587 592 617 622 636 621 598 605 625 604 616
621 612
1998 : 599 593 576 554 546 535 542 518 496 489 502
507 538
:
: 1990-92 = 100
:
1991 : 98 101 96 98
98
1992 : 100 101 100 96
99
1993 : 100 100 103 104
102
1994 : 112 110 104 99
106
1995 : 97 95 97 100 99 99 101 103 104 108 113
119 103
1996 : 121 123 125 131 138 137 140 139 135 124 119
120 129
1997 : 120 121 126 127 130 127 122 124 128 124 126
127 125
1998 : 123 122 118 113 112 110 111 106 102 100 103
104 110

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Livestock and Poultry							
						1910-14 = 100							
1991	1320		1374			1305			1232				1308
1992	1201		1211			1232			1249				1223
1993	1316		1360			1321			1313				1327
1994	1276		1274			1167			1111				1207
1995	1169	1124	1073	1050	1025	1054	1029	1021	1016	1016	983	1005	1047
1996	939	929	917	877	889	930	956	990	1019	1009	1044	1047	962
1997	1092	1136	1144	1205	1226	1220	1282	1242	1231	1209	1198	1218	1200
1998	1199	1209	1169	1202	1172	1124	1062	1067	1019	1094	1100	1092	1126
						1990-92 = 100							
1991	103		107			102			96				102
1992	94		95			96			98				96
1993	103		106			103			103				104
1994	100		100			91			87				94
1995	91	88	84	82	80	83	80	80	79	80	77	79	82
1996	73	73	72	69	70	73	75	77	80	79	82	82	75
1997	85	89	89	94	96	95	100	97	96	95	94	95	94
1998	94	95	91	94	92	88	83	83	80	86	86	85	88
						Seeds							

					1910-14 = 100							
1991	996	978	978	978	983							
1992	978	975	975	975	976							
1993	975	1011	1011	1011	1002							
1994	1011	1092	1092	1092	1071							
1995	1092	1092	1092	1087	1087	1087	1087	1087	1087	1087	1087	1088
1996	1087	1087	1087	1161	1161	1161	1161	1161	1161	1161	1161	1142
1997	1161	1161	1161	1186	1186	1186	1186	1186	1186	1186	1186	1179
1998	1186	1186	1186	1216	1216	1216	1216	1216	1216	1216	1216	1208
					1990-92 = 100							
1991	101	99	99	99	99							
1992	99	99	99	99	99							
1993	99	102	102	102	101							
1994	102	110	110	110	108							
1995	110	110	110	110	110	110	110	110	110	110	110	110
1996	110	110	110	117	117	117	117	117	117	117	117	115
1997	117	117	117	120	120	120	120	120	120	120	120	119
1998	120	120	120	123	123	123	123	123	123	123	123	122

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg

					Fertilizer							
					1910-14 = 100							
1991	383		379		369				374			376
1992	371		368		368				356			366
1993	359		355		349				346			352
1994	364		385		393				404			387
1995	420	432	442	462	462	459	448	435	434	436	445	452 444
1996	466	471	478	476	468	457	444	440	441	448	449	455 458
1997	455	457	457	455	453	446	439	438	437	432	429	423 443
1998	426	422	423	416	420	419	416	410	403	401	396	391 412
					1990-92 = 100							
1991	104		103		101				102			103
1992	101		100		100				97			100
1993	98		97		95				94			96
1994	99		105		107				110			105
1995	115	118	121	126	126	125	122	119	118	119	121	123 121
1996	127	128	130	130	128	125	121	120	120	122	123	124 125
1997	124	125	125	124	124	122	120	120	119	118	117	115 121
1998	116	115	115	114	115	114	113	112	110	109	108	107 112
					Agricultural Chemicals							
					1910-14 = 100							
1991	609		631		629				628			624
1992	624		642		644				640			638
1993	660		672		675				682			672
1994	693		693		693				702			695

1995 : 707 713 711 711 712 715 717 719 722 723 725
728 717
1996 : 734 736 738 736 731 731 726 733 743 741 741
742 736
1997 : 744 730 732 740 746 745 743 743 749 754 759
760 745
1998 : 763 760 760 755 755 757 754 760 738 747 745
746 753
: 1990-92 = 100
1991 : 99 102 102 102
101
1992 : 101 104 104 104
103
1993 : 107 109 109 110
109
1994 : 112 112 112 114
112
1995 : 114 115 115 115 115 116 116 116 117 117 117
118 116
1996 : 119 119 119 119 118 118 117 119 120 120 120
120 119
1997 : 120 118 118 120 121 120 120 120 121 122 123
123 121
1998 : 123 123 123 122 122 122 122 123 119 121 120
121 122

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Fuels													
1910-14 = 100													
1991	1014		734			706			753			802	
1992	732		709			759			758			740	

1993 : 678 748 699 743
717
1994 : 602 696 711 745
689
1995 : 714 714 729 709 729 708 662 663 674 662 651
662 690
1996 : 693 670 708 813 821 752 757 766 832 880 884
896 789
1997 : 887 870 808 799 785 775 750 809 825 840 848
790 816
1998 : 733 700 657 686 717 686 675 658 687 698 687
606 682
:
: 1990-92 = 100
:
1991 : 132 95 92 98
104
1992 : 95 92 98 98
96
1993 : 88 97 91 96
93
1994 : 78 90 92 97
89
1995 : 93 92 94 92 94 92 86 86 87 86 84
86 89
1996 : 90 87 92 105 106 97 98 99 108 114 115
116 102
1997 : 115 113 105 104 102 100 97 105 107 109 110
102 106
1998 : 95 91 85 89 93 89 87 85 89 90 89
79 88
:
: Farm Supplies and Repairs
:
: 1910-14 = 100
:
1991 : 700 700 721 729
713
1992 : 723 725 747 749
736
1993 : 745 757 760 765
757
1994 : 762 778 783 782
776
1995 : 787 790 792 795 798 798 800 800 800 805 805
806 798
1996 : 810 811 813 817 814 815 814 817 817 819 820
820 816
1997 : 825 829 831 834 837 836 839 837 838 837 839
838 835
1998 : 838 839 840 845 844 846 848 848 851 855 851
850 846
:
: 1990-92 = 100

1991	99		99		102		103					100
1992	102		102		105		106					104
1993	105		107		107		108					107
1994	107		110		110		110					109
1995	111	111	112	112	112	112	113	113	113	113	113	114 112
1996	114	114	115	115	115	115	115	115	115	115	116	116 115
1997	116	117	117	117	118	118	118	118	118	118	118	118 118
1998	118	118	118	119	119	119	119	120	120	120	120	120 119

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Autos and Trucks							
						1910-14 = 100							
1991	2625		2651			2658			2653			2647	
1992	2695		2720			2750			2729			2724	
1993	2800		2828			2835			2870			2833	
1994	2922		2948			2967			2993			2958	
1995	3025	3031	3035	3045	3050	3051	3045	3041	3055	3077	3085	3100	3053
1996	3114	3118	3111	3120	3119	3120	3115	3109	3117	3135	3166	3166	3126
1997	3176	3188	3186	3180	3164	3154	3148	3135	3134	3152	3158	3160	3161

1998 :3169 3170 3170 3171 3147 3125 3133 3138 3133 3133 3160
3173 3152
     :
     :   1990-92 = 100
     :
1991 : 99   100   100   100
100
1992 : 101   102   103   103
102
1993 : 105   106   107   108
107
1994 : 110   111   112   113
111
1995 : 114   114   114   114 115   115   115 114   115   116   116
117   115
1996 : 117   117   117   117 117   117   117 117   117   118   119
119   118
1997 : 119   120   120   120 119   119   118 118   118   119   119
119   119
1998 : 119   119   119   119 118   118   118 118   118   118   119
119   119
     :
     :   Farm Machinery
     :
     :   1910-14 = 100
     :
1991 :2480   2503   2520   2536
2510
1992 :2573   2607   2600   2614
2599
1993 :2629   2693   2695   2739
2689
1994 :2770   2851   2855   2895
2843
1995 :2977 2978 2980 2986 2991 2995 2998 3002 3012 3039 3072
3073 3009
1996 :3092 3096 3100 3111 3113 3114 3129 3135 3142 3161 3169
3176 3128
1997 :3181 3185 3188 3196 3202 3205 3207 3214 3221 3260 3263
3269 3216
1998 :3274 3279 3288 3300 3309 3321 3328 3339 3350 3389 3391
3399 3331
     :
     :   1990-92 = 100
     :
1991 : 99   100   100   101
100
1992 : 103   104   104   104
104
1993 : 105   107   107   109
107
1994 : 110   114   114   115
113

1995 : 119 119 119 119 119 119 119 120 120 121 122
123 120
1996 : 123 123 124 124 124 124 125 125 125 126 126
127 125
1997 : 127 127 127 127 128 128 128 128 128 130 130
130 128
1998 : 131 131 131 132 132 132 133 133 134 135 135
136 133

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Building Materials													
1910-14 = 100													
1991	1350	1351	1368	1363									1358
1992	1361	1380	1382	1386									1377
1993	1411	1452	1433	1448									1436
1994	1476	1477	1490	1508									1488
1995	1536	1541	1549	1554	1554	1552	1559	1562	1564	1560	1555	1553	1553
1996	1551	1552	1554	1558	1569	1574	1571	1575	1583	1577	1584	1582	1569
1997	1585	1593	1598	1605	1609	1607	1609	1608	1605	1600	1602	1600	1602
1998	1599	1600	1604	1607	1606	1604	1609	1611	1610	1604	1602	1602	1605
1990-92 = 100													
1991	99	99	101	100									100
1992	100	102	102	102									101

1993 : 104 107 105 107
106
1994 : 109 109 110 111
109
1995 : 113 113 114 114 114 114 115 115 115 115 114
114 114
1996 : 114 114 114 115 115 116 116 116 116 116 117
116 115
1997 : 117 117 118 118 118 118 118 118 118 118 118
118 118
1998 : 118 118 118 118 118 118 118 119 119 118 118
118 118

: Farm Services and Rent 1/ :

: 1910-14 = 100 :

1991 :1175 1185 1171 1174
1176
1992 :1237 1236 1235 1239
1237
1993 :1258 1257 1269 1266
1262
1994 :1301 1298 1311 1305
1304
1995 :1369 1372 1377 1377 1382 1392 1393 1395 1394 1389 1385
1383 1384
1996 :1441 1439 1440 1438 1438 1444 1449 1449 1449 1442 1438
1437 1442
1997 :1473 1473 1474 1472 1474 1484 1485 1483 1485 1475 1474
1471 1477
1998 :1473 1470 1470 1470 1471 1480 1480 1478 1476 1470 1466
1465 1472

1/ For the 1990-92=100 period, the Farm Services and Rent Index is separated.

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Farm Services													

```
     :
     :                              1990-92 = 100
     :
1991 :  98                 99                 97                 98
98
1992 : 103                103                103                104
103
1993 : 109                109                111                111
110
1994 : 110                109                111                111
110
1995 : 113   114   114   114  115   116   117  117   117   116   115
115   115
1996 : 116   115   115   115  115   116   117  117   117   116   115
115   116
1997 : 116   116   116   115  116   117   117  117   117   116   116
115   116
1998 : 117   116   116   116  116   118   118  117   117   116   116
116   117
     :
     :                                   Rent
     :
     :                              1990-92 = 100
     :
1991 : 100                100                100                100
100
1992 : 104                104                104                104
104
1993 : 100                100                100                100
100
1994 : 108                108                108                108
108
1995 : 117   117   117   117  117   117   117  117   117   117   117
117   117
1996 : 128   128   128   128  128   128   128  128   128   128   128
128   128
1997 : 136   136   136   136  136   136   136  136   136   136   136
136   136
1998 : 134   134   134   134  134   134   134  134   134   134   134
134   134
     :
     :                                Interest
     :
     :                              1910-14 = 100
     :
1991 :2516                2516                2516                2516
2516
1992 :2321                2321                2321                2321
2321
1993 :2191                2191                2191                2191
2191
1994 :2370                2370                2370                2357
2367
```

1995 :2548 2548 2548 2548 2548 2548 2548 2548 2548 2548 2548
2548 2548
1996 :2652 2652 2652 2652 2652 2652 2652 2652 2652 2652 2652
2652 2652
1997 :2662 2662 2662 2662 2662 2662 2662 2662 2662 2662 2662
2662 2662
1998 :2739 2739 2739 2739 2739 2739 2739 2739 2739 2739 2739
2739 2739
     :
     :   1990-92 = 100
     :
1991 : 100   100   100   100
100
1992 : 93   93   93   93
93
1993 : 87   87   87   87
87
1994 : 95   95   95   94
94
1995 : 102   102   102   102 102   102   102 102   102   102   102
102   102
1996 : 106   106   106   106 106   106   106 106   106   106   106
106   106
1997 : 106   106   106   106 106   106   106 106   106   106   106
106   106
1998 : 109   109   109   109 109   109   109 109   109   109   109
109   109

Prices Paid Indexes: Quarterly or Monthly and Annual Average,
United States, 1991-98

     :   :   :   :   :   :   :   :   :   :   :   :
:
 Year: Jan : Feb : Mar :Apr : May : Jun :Jul : Aug : Sep : Oct : Nov :
Dec :Avg
     :   :   :   :   :   :   :   :   :   :   :   :
:

     :   Taxes
     :
     :   1910-14 = 100
     :
1991 :2707   2707   2707   2707
2707
1992 :2789   2789   2789   2789
2789

1993 :2886 2886 2886 2886
2886
1994 :2828 2828 2828 2828
2828
1995 :2915 2915 2915 2915 2915 2915 2915 2915 2915 2915 2915
2915 2915
1996 :3001 3001 3001 3001 3001 3001 3001 3001 3001 3001 3001
3001 3001
1997 :3093 3093 3093 3093 3093 3093 3093 3093 3093 3093 3093
3093 3093
1998 :3185 3185 3185 3185 3185 3185 3185 3185 3185 3185 3185
3185 3185
:
: 1990-92 = 100
:
1991 : 101 101 101 101
101
1992 : 104 104 104 104
104
1993 : 108 108 108 108
108
1994 : 106 106 106 106
106
1995 : 109 109 109 109 109 109 109 109 109 109 109
109 109
1996 : 112 112 112 112 112 112 112 112 112 112 112
112 112
1997 : 115 115 115 115 115 115 115 115 115 115 115
115 115
1998 : 119 119 119 119 119 119 119 119 119 119 119
119 119
:
: Wage Rates
:
: 1910-14 = 100
:
1991 :3877 3754 3599 3799
3757
1992 :4116 3909 3760 3935
3930
1993 :4135 4116 3922 4045
4055
1994 :4226 4148 4013 4174
4140
1995 :4349 4349 4349 4161 4161 4161 4349 4349 4349 4252 4252
4252 4278
1996 :4452 4452 4452 4368 4368 4368 4232 4232 4232 4504 4504
4504 4389
1997 :4652 4652 4652 4542 4542 4542 4446 4446 4446 4723 4723
4723 4591
1998 :4917 4917 4917 4840 4840 4840 4678 4678 4678 4911 4911
4911 4836
:
: 1990-92 = 100

1991	104			100			96			102		100
1992	110			104			101			105		105
1993	111			110			105			108		108
1994	113			111			107			112		111
1995	116	116	116	111	111	111	116	116	116	114	114	114
1996	119	119	119	117	117	117	113	113	113	120	120	120
1997	124	124	124	121	121	121	119	119	119	126	126	126
1998	131	131	131	129	129	129	125	125	125	131	131	131

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Family Living							
						1910-14 = 100							
1991	1271			1283			1292			1303			1287
1992	1310			1323			1332			1342			1327
1993	1354			1368			1371			1384			1369
1994	1389			1400			1409			1420			1404
1995	1428	1433	1438	1443	1446	1448	1448	1452	1455	1460	1459	1458	1447
1996	1466	1471	1479	1484	1487	1488	1491	1494	1499	1503	1506	1506	1490
1997	1511	1516	1520	1522	1521	1522	1524	1527	1531	1535	1534	1532	1525

1998 :1535 1538 1541 1543 1546 1548 1550 1552 1554 1558 1558
1557 1548
     :
     :   1990-92 = 100
     :
1991 : 99   100   101   102
101
1992 : 102   103   104   105
104
1993 : 106   107   107   108
107
1994 : 108   109   110   111
110
1995 : 111   112   112   113 113   113   113 113   114   114   114
114   113
1996 : 115   115   116   116 116   116   116 117   117   117   118
118   116
1997 : 118   118   119   119 119   119   119 119   120   120   120
120   119
1998 : 120   120   120   121 121   121   121 121   121   122   122
122   121
     :
     :   Production Items With Farm Origin 1/
     :
     :   1990-92 = 100
     :
1991 : 100   103   98   98
100
1992 : 98   98   98   97
98
1993 : 101   103   103   103
102
1994 : 106   106   100   96
102
1995 : 96   94   94   95   93   94   94   95   96   98   99
103   96
1996 : 102   102   103   106 110   111   113 113   112   106   105
105   107
1997 : 107   109   112   115 117   115   114 114   116   113   114
115   113
1998 : 112   112   109   108 106   104   103 100   97   98   100
100   104
     :
     :   Production Items With Non-Farm Origin 2/
     :
     :   1990-92 = 100
     :
1991 : 102   100   99   100
100
1992 : 102   102   103   103
102
1993 : 103   105   104   105
104

1994 : 106 108 109 110
108
1995 : 113 114 114 115 115 115 115 115 115 115 115
115 115
1996 : 118 118 119 120 119 119 119 119 120 120 120
120 119
1997 : 122 122 121 121 121 121 121 121 122 121 121
121 121
1998 : 121 120 120 120 120 120 120 120 120 120 119
119 120

1/ Feed, livestock and poultry purchases, and seed.
2/ Fertilizer, agricultural chemicals, fuels, farm supplies and repairs, autos
and trucks, farm machinery, building materials, and farm services and rent.

Prices Paid Indexes: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Crop Sector (PPITW) 1990-92 = 100													
1991	101		100				99			101			100
1992	102		102				102			102			102
1993	103		104				104			105			104
1994	106		108				108			109			108
1995	112	112	112	112	113	113	113	113	113	113	113	113	113
1996	116	116	117	117	117	117	117	117	117	118	118	118	117
1997	120	120	120	120	120	120	119	120	120	120	120	120	120
1998	121	120	120	120	120	120	120	120	119	120	120	120	120

:
:
: Livestock Sector (PPITW)
:
: 1990-92 = 100
:
:

1991 :	101		101		99		100					
100												
1992 :	100		101		101		101					
101												
1993 :	103		104		104		105					
104												
1994 :	107		107		105		104					
105												
1995 :	106	105	105	106	105	106	106	106	106	107	108	
109	106											
1996 :	111	111	111	112	114	114	115	115	115	113	113	
113	113											
1997 :	114	115	116	117	118	117	117	117	118	117	117	
117	117											
1998 :	117	117	115	115	114	113	113	112	110	111	112	
112	113											

:
:
: Commodities and Services, Interest, Taxes, and Wage Rates
:
: Adjusted for Productivity
:
: 1910-14 = 100
:
:

1991 :	928		918		907		924					
919												
1992 :	927		915		910		922					
919												
1993 :	925		928		917		928					
924												
1994 :	943		942		933		943					
940												
1995 :	980	981	982	971	971	973	985	985	987	982	983	
985	980											
1996 :	1013	1014	1017	1015	1017	1017	1010	1010	1012	1028	1028	
1028	1017											
1997 :	1028	1030	1032	1026	1027	1027	1019	1020	1022	1040	1040	
1040	1029											
1998 :	1055	1054	1053	1048	1048	1047	1035	1034	1032	1049	1050	
1049	1046											

Prices Paid Indexes: Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
					Parity Ratio 1/								
					1910-14 = 100								
1991	47	47	48	48	49	48	47	47	47	47	47	46	47
1992	46	47	47	47	47	47	47	47	47	46	45	45	47
1993	45	46	46	48	47	46	46	47	47	46	47	47	47
1994	47	47	47	46	45	44	44	44	44	43	43	45	45
1995	43	43	43	44	44	44	44	45	45	45	46	46	44
1996	46	45	46	45	46	49	49	48	48	46	46	45	47
1997	44	43	44	43	43	43	43	43	43	43	43	42	43
1998	41	41	41	42	42	42	42	42	41	41	41	41	41
					Adjusted Parity Ratio 2/								
					1910-14 = 100								
1991	49	49	51	51	52	50	49	49	50	49	49	49	50
1992	48	49	50	49	49	50	49	50	49	48	48	48	49
1993	48	49	50	51	51	50	50	50	51	50	50	51	50
1994	49	49	49	48	47	46	46	46	45	45	45	47	47
1995	45	45	45	45	46	46	46	47	47	47	47	48	46
1996	47	46	48	47	48	51	51	50	50	48	47	46	48
1997	45	44	45	44	45	45	45	45	45	45	45	44	45
1998	44	43	44	45	45	44	44	45	44	44	44	43	44

					Ratio 2/							
					1990-92 = 100							
1991	99	99	101	101	103	100	99	99	99	98	98	97
99												
1992	96	98	99	98	98	99	98	99	98	96	95	95
97												
1993	94	95	96	100	99	97	97	98	98	97	98	99
97												
1994	99	98	99	95	94	93	92	92	92	90	90	93
94												
1995	91	91	91	91	92	92	94	94	95	95	96	97
93												
1996	96	94	96	94	97	103	103	101	100	97	96	94
98												
1997	91	90	92	90	91	90	91	92	90	90	90	88
90												
1998	87	85	86	88	88	87	88	88	87	85	86	85
87												

1/ Ratio of prices received by farmers to index of prices paid by farmers for commodities and services, interest, taxes, and wage rates.

2/ Ratio of the index of prices received by farmers after adjustment for govenment payments to the index of prices paid for commodities and services, interest, taxes, and wage rates.

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Feed Sub-Components							
						Feed Grains							
						1990-92 = 100							
1991	96			103			97			98			99

1992 :	103			106			99			87		
99												
1993 :	87			92			95			97		
93												
1994 :	115			112			97			88		
103												
1995 :	93	95	98	100	103	109	114	113	116	121	125	
134	110											
1996 :	135	146	152	167	179	178	185	178	150	122	113	
111	151											
1997 :	114	113	118	118	114	109	104	107	107	108	107	
107	111											
1998 :	109	109	108	102	99	98	94	82	78	81	82	
85	94											

Complete Feeds
1990-92 = 100

1991 :	98			99			98			101		
99												
1992 :	101			100			102			100		
101												
1993 :	101			100			103			105		
102												
1994 :	111			106			105			100		
105												
1995 :	98	97	98	97	96	97	99	101	102	106	111	
116	101											
1996 :	121	121	122	125	132	133	134	134	136	128	122	
122	128											
1997 :	121	122	125	126	129	128	125	125	127	124	125	
126	125											
1998 :	121	119	118	115	113	112	114	112	106	104	107	
109	113											

Hay and Forages
1990-92 = 100

1991 :	104			107			90			89		
98												
1992 :	89			95			92			91		
92												
1993 :	100			108			101			106		
104												
1994 :	112			123			108			111		
114												
1995 :	108	107	108	111	113	105	105	104	103	103	103	
102	106											
1996 :	103	103	105	114	123	120	120	118	117	116	117	
117	114											
1997 :	126	131	135	137	142	134	123	124	125	129	126	
122	130											
1998 :	123	125	123	122	128	117	114	116	112	110	106	
103	116											

					Concentrates							
					1990-92 = 100							
1991	95		98		96		104					
98												
1992	98		100		104		101					
101												
1993	109		102		118		106					
109												
1994	107		109		106		97					
105												
1995	89	85	87	96	90	90	89	95	97	102	110	
114	95											
1996	119	115	115	120	121	117	121	124	132	118	116	
118	120											
1997	117	120	130	135	148	143	142	145	160	133	146	
149	139											
1998	131	131	122	110	109	110	121	108	104	98	104	
104	113											

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Supplements							
						1990-92 = 100							
1991	104		100			89			89				
96													
1992	104		101			93			97				
99													
1993	100		101			99			106				
101													
1994	118		108			106			102				
108													
1995	98	93	99	108	102	97	102	102	104	110	114	129	105
1996	123	124	124	125	133	134	138	137	131	126	127	128	129

1997 : 126 125 131 127 124 123 115 117 124 129 134
139 126
1998 : 139 133 125 122 117 109 110 109 107 108 114
118 117
:
: Livestock and Poultry Sub-Components
:
: Feeder Cattle
: 1990-92 = 100
:
1991 : 104 106 103 97
103
1992 : 96 94 99 99
97
1993 : 105 106 106 104
105
1994 : 102 98 92 88
95
1995 : 93 88 83 79 76 79 79 78 78 77 73
76 80
1996 : 70 68 66 62 64 69 72 73 75 72 75
75 70
1997 : 80 84 84 89 92 92 98 95 95 94 94
96 91
1998 : 95 95 92 95 92 87 81 82 78 85 86
85 88
:
: Feeder Pigs
: 1990-92 = 100
:
1991 : 107 144 98 85
109
1992 : 65 88 62 76
73
1993 : 83 116 83 95
94
1994 : 73 103 65 49
73
1995 : 61 61 61 84 84 84 60 60 60 73 73
73 70
1996 : 67 73 81 78 73 67 64 86 90 105 111
112 84
1997 : 112 118 121 136 128 119 119 109 97 87 81
77 109
1998 : 68 81 68 70 72 70 65 62 55 55 53
55 65
:
: Milk Cow Replacements
: 1990-92 = 100
:
1991 : 98 96 97 98
97
1992 : 97 99 102 102
100

1993 : 101 103 104 104
103
1994 : 104 105 103 103
104
1995 : 102 102 102 101 101 101 100 100 100 97 97
97 100
1996 : 94 94 94 95 95 95 97 97 97 100 100
100 96
1997 : 97 97 97 98 98 98 98 98 98 97 97
97 97
1998 : 95 95 95 98 98 98 99 99 99 105 105
105 99

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
						Poultry							
						1990-92 = 100							
1991	97			98			100				99		98
1992	100			103			102				101		101
1993	103			106			99				100		102
1994	102			103			103				103		103
1995	100	100	100	100	100	100	100	100	100	100	100	100	100
1996	102	102	102	102	102	102	102	102	102	102	102	102	102
1997	106	106	106	106	106	106	106	106	106	106	106	106	106
1998	110	110	110	110	110	110	110	110	110	110	110	110	110
						Seeds Sub-Components							
						Field Crops							
						1990-92 = 100							

:
1991 : 101 99 99 99
99
1992 : 99 99 99 99
99
1993 : 99 101 101 101
101
1994 : 101 110 110 110
108
1995 : 110 110 110 109 109 109 109 109 109 109 109
109 109
1996 : 109 109 109 117 117 117 117 117 117 117 117
117 115
1997 : 117 117 117 119 119 119 119 119 119 119 119
119 118
1998 : 119 119 119 123 123 123 123 123 123 123 123
123 122
:
:
: Grasses and Legumes
: 1990-92 = 100
:
1991 : 102 101 101 101
101
1992 : 101 91 91 91
93
1993 : 91 112 112 112
107
1994 : 112 114 114 114
113
1995 : 114 114 114 119 119 119 119 119 119 119 119
119 118
1996 : 119 119 119 120 120 120 120 120 120 120 120
120 120
1997 : 120 120 120 130 130 130 130 130 130 130 130
130 128
1998 : 130 130 130 123 123 123 123 123 123 123 123
123 124
:
: Fertilizer Sub-Components
:
: Mixed Fertilizer
: 1990-92 = 100
:
1991 : 101 104 102 102
102
1992 : 99 100 100 98
99
1993 : 97 92 91 91
92
1994 : 94 100 102 102
99
1995 : 102 104 106 116 117 117 117 117 117 117 118
118 114

1996 : 121 123 124 126 125 125 123 122 122 121 120
119 123
1997 : 119 119 119 118 118 118 117 117 117 116 116
116 117
1998 : 119 118 118 117 116 116 116 116 116 115 115
114 116

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
					Nitrogen 1990-92 = 100								
1991	108		103			99			103				103
1992	104		101			102			98				101
1993	101		102			100			98				100
1994	104		112			115			121				113
1995	130	135	138	143	143	141	135	126	125	126	130	134	134
1996	139	139	143	140	137	131	125	123	124	130	130	135	133
1997	136	137	136	135	134	130	126	126	125	122	121	117	129
1998	115	114	114	111	113	112	110	106	102	101	98	95	108
					Potash and Phosphate 1990-92 = 100								
1991	104		104			102			102				103
1992	99		99			98			94				98
1993	92		95			96			95				94

1994 : 103 99 102 105
102
1995 : 108 111 115 107 105 102 101 101 102 103 106
107 106
1996 : 109 111 113 111 108 107 103 104 105 105 107
107 107
1997 : 107 108 109 110 110 108 108 109 109 109 110
111 109
1998 : 111 111 112 114 115 115 115 116 115 118 118
117 115
:
: Agricultural Chemicals Sub-Components
:
: Herbicides
: 1990-92 = 100
:
1991 : 99 102 102 102
101
1992 : 101 103 104 102
102
1993 : 106 106 106 107
106
1994 : 108 111 111 112
110
1995 : 113 113 113 113 113 114 114 114 115 115 116
116 114
1996 : 116 117 117 117 116 116 116 117 119 119 119
118 117
1997 : 117 114 114 116 118 117 117 117 117 119 120
120 117
1998 : 120 119 119 118 117 118 118 120 114 115 115
116 117
:
: Insecticides
: 1990-92 = 100
:
1991 : 99 102 100 101
101
1992 : 101 106 104 105
104
1993 : 107 113 115 118
113
1994 : 122 116 113 117
117
1995 : 117 117 117 121 120 121 121 122 121 122 122
123 120
1996 : 126 126 128 126 125 125 121 123 126 125 125
127 125
1997 : 130 129 129 129 129 130 128 128 132 132 133
134 130
1998 : 135 136 136 136 136 135 133 134 134 139 136
135 135

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
						Fungicides and Other 1990-92 = 100							
1991	97			100			102			103			101
1992	103			105			106			106			105
1993	109			112			112			112			111
1994	114			113			115			115			114
1995	116	121	121	116	117	117	117	117	117	117	117	117	117
1996	117	117	117	117	117	117	117	117	118	116	117	117	117
1997	118	118	118	120	119	119	120	120	120	120	120	120	119
1998	121	120	120	119	120	120	121	117	118	118	119	119	119
						Fuels Sub-Components							
						Diesel 1990-92 = 100							
1991	135			93			87			98			103
1992	94			90			98			97			95
1993	87			94			86			99			91
1994	76			88			88			94			86
1995	87	85	88	87	89	84	79	82	85	85	86	86	85
1996	88	84	88	105	104	92	94	95	108	116	112	112	100

1997 : 108 109 100 100 97 94 90 97 97 103 106
96 100
1998 : 89 85 80 84 85 79 78 79 86 86 85
73 82
:
:
: Gasoline
: 1990-92 = 100
:
1991 : 121 99 97 96
103
1992 : 90 95 103 99
97
1993 : 88 102 98 96
96
1994 : 80 92 98 100
93
1995 : 97 97 99 97 103 101 94 92 91 86 81
84 93
1996 : 90 87 95 106 112 106 104 103 105 106 110
110 103
1997 : 111 109 108 107 109 108 106 114 118 112 109
105 110
1998 : 98 93 87 92 101 101 100 94 94 98 95
83 95
:
:
: LP Gas
: 1990-92 = 100
:
1991 : 147 93 96 101
109
1992 : 113 93 89 100
99
1993 : 93 97 92 87
92
1994 : 80 96 92 99
92
1995 : 106 111 109 96 95 98 91 87 87 89 89
90 96
1996 : 97 100 101 105 99 98 100 107 118 128 138
156 112
1997 : 157 142 119 111 104 110 105 111 119 125 129
124 121
1998 : 115 110 104 100 102 96 91 89 86 87 92
92 97

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/
Farm Supplies & Repairs Sub-Components													
Supplies 1990-92 = 100													
1991	100			101			102			102			101
1992	103			103			105			104			103
1993	105			106			105			106			105
1994	106			107			106			107			106
1995	108	109	109	109	110	110	110	110	110	112	112	112	110
1996	112	113	113	113	113	113	113	113	113	113	113	113	113
1997	114	114	114	114	115	115	115	115	115	114	114	114	114
1998	114	114	115	115	115	116	116	116	115	116	115	115	115
Repairs 1990-92 = 100													
1991	98			98			101			103			100
1992	101			102			105			106			104
1993	105			107			108			109			107
1994	108			111			112			112			111
1995	112	112	113	113	114	114	114	114	114	114	114	114	114
1996	115	115	115	116	116	116	116	116	116	117	117	117	116
1997	118	118	118	119	119	119	120	120	120	120	120	120	119
1998	120	120	120	121	121	121	121	121	122	123	122	122	121
Autos and Trucks Sub-Components													
Autos 1990-92 = 100													

1991	99			99			100			99		99
1992	101			101			102			102		101
1993	105			105			105			106		105
1994	108			108			109			109		109
1995	111	111	111	112	112	111	111	110	110	111	112	113 111
1996	113	113	113	113	113	113	113	113	113	113	114	114 113
1997	114	114	114	114	114	113	113	112	112	113	113	113 113
1998	114	113	113	113	113	112	112	112	112	112	113	113 113

Trucks
1990-92 = 100

1991	99			100			100			100		100
1992	101			103			104			103		103
1993	105			107			107			108		107
1994	110			111			112			113		112
1995	114	114	115	115	115	115	115	115	116	116	117	117 115
1996	118	118	118	118	118	118	118	118	118	119	120	120 118
1997	120	121	121	120	120	119	119	119	119	119	120	120 120
1998	120	120	120	120	119	118	119	119	119	119	120	120 119

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

Year:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg 1/

	Farm Machinery Sub-Components										
					Tractors						
					1990-92 = 100						
1991	96	100			99				100		
99											
1992	103	104			105				105		
104											
1993	106	108			108				111		
108											
1994	111	114			114				115		
114											
1995	116	116	116	117	117	117	117	117	117	118	119
119	117										
1996	120	120	119	119	120	120	120	121	122	122	123
124	121										
1997	124	125	125	125	126	126	126	126	126	129	129
129	126										
1998	129	129	130	130	130	130	130	130	130	132	132
132	130										
					Self Propelled						
					1990-92 = 100						
1991	100	99			101				101		
100											
1992	103	103			104				104		
104											
1993	105	107			107				108		
107											
1994	110	115			115				117		
114											
1995	122	122	122	121	122	122	122	122	122	124	126
126	123										
1996	127	127	127	128	127	127	128	128	127	128	128
128	128										
1997	128	127	127	127	127	127	127	127	128	129	129
130	128										
1998	130	130	130	131	131	132	133	133	134	136	136
136	133										
					Other Machinery						
					1990-92 = 100						
1991	99	100			100				101		
100											
1992	101	104			102				104		
103											
1993	104	108			108				109		
107											

1994 : 110 112 112 114
112
1995 : 116 116 117 118 118 118 119 119 119 120 99
1992 : 103 104 105 105
104
1993 : 106 108 108 111
108
1994 : 111 114 114 115
114
1995 : 116 116 116 117 117 117 117 117 117 118 119
119 117
1996 : 120 120 119 119 120 120 120 121 122 122 123
124 121
1997 : 124 125 125 125 126 126 126 126 126 129 129
129 126
1998 : 129 129 130 130 130 130 130 130 130 132 132
132 130
:
: Self Propelled
: 1990-92 = 100
:
1991 : 100 99 101 101
100
1992 : 103 103 104 104
104
1993 : 105 107 107 108
107
1994 : 110 115 115 117
114
1995 : 122 122 122 121 122 122 122 122 122 124 126
126 123
1996 : 127 127 127 128 127 127 128 128 127 128 128
128 128
1997 : 128 127 127 127 127 127 127 127 128 129 129
130 128
1998 : 130 130 130 131 131 132 133 133 134 136 136
136 133
:
: Other Machinery
: 1990-92 = 100
:
1991 : 99 100 100 101
100
1992 : 101 104 102 104
103
1993 : 104 108 108 109
107
1994 : 110 112 112 114
112
1995 : 116 116 117 118 118 118 119 119 119 120 121
121 119
1996 : 121 122 122 123 123 123 124 125 125 126 127
127 124

1997 : 127 128 129 129 129 130 130 130 131 131 131
132 130
1998 : 132 132 133 133 134 134 134 135 136 136 137
137 134
: :
: Farm Services Sub-Components
: :
: Custom Rates
: 1990-92 = 100
: :
1991 : 100 100 100 100
100
1992 : 106 105 105 105
105
1993 : 109 109 109 109
109
1994 : 104 104 104 104
104
1995 : 111 111 111 111 111 111 111 111 111 111 111
111 111
1996 : 113 113 113 113 113 113 113 113 113 113 113
113 113
1997 : 115 115 115 115 115 115 115 115 115 115 115
115 115
1998 : 117 117 117 117 117 117 117 117 117 117 117
117 117

Prices Paid Index Sub-Components: Quarterly or Monthly and Annual Average, United States, 1991-98

: : : : : : : : : : : :
:
Year: Jan : Feb : Mar :Apr : May : Jun :Jul : Aug : Sep : Oct : Nov :
Dec :Avg
: : : : : : : : : : : :
: 1/

: Other Services
: 1990-92 = 100
:
1991 : 98 99 97 98
98
1992 : 103 103 103 104
103
1993 : 109 109 111 111
110
1994 : 111 110 112 112
111

1995 : 113 114 115 115 115 117 117 118 117 117 116
116 116
1996 : 116 116 116 116 115 116 117 117 117 116 115
115 116
1997 : 116 116 116 116 116 117 118 117 118 116 116
115 116
1998 : 117 116 116 116 116 118 118 117 117 116 115
115 117
:
: Rent Sub-Components
:
: Cash
: 1990-92 = 100
:
1991 : 108 108 108 108
108
1992 : 100 100 100 100
100
1993 : 110 110 110 110
110
1994 : 115 115 115 115
115
1995 : 123 123 123 123 123 123 123 123 123 123 123
123 123
1996 : 129 129 129 129 129 129 129 129 129 129 129
129 129
1997 : 135 135 135 135 135 135 135 135 135 135 135
135 135
1998 : 141 141 141 141 141 141 141 141 141 141 141
141 141
:
: Share
: 1990-92 = 100
:
1991 : 94 94 94 94
94
1992 : 108 108 108 108
108
1993 : 92 92 92 92
92
1994 : 103 103 103 102
103
1995 : 113 113 113 113 113 113 113 113 113 113 113
113 113
1996 : 128 128 128 128 128 128 128 128 128 128 128
128 128
1997 : 136 136 136 136 136 136 136 136 136 136 136
136 136
1998 : 129 129 129 129 129 129 129 129 129 129 129
129 129

Feed Price Ratios, Monthly, United States,
January 1988 - December 1998 1/

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average 2/
						Milk-Feed Ratio 3/							
1988	3.34	3.14	2.98	2.80	2.57	2.28	2.11	2.23	2.40	2.50	2.59	2.59	2.63
1989	2.51	2.45	2.30	2.26	2.25	2.38	2.52	2.83	2.97	3.22	3.34	3.39	2.70
1990	3.25	3.02	2.84	2.59	2.54	2.72	2.79	2.92	2.93	2.82	2.83	2.59	2.82
1991	2.57	2.52	2.42	2.34	2.41	2.54	2.73	2.82	2.94	3.14	3.25	3.19	2 74
1992	3.04	2.86	2 77	2.79	2.68	2.81	3.06	3.20	3.22	3.29	3.23	3.13	3.01
1993	2.96	2.87	2.77	2.79	2.81	2.91	2.78	2.70	2.80	2.79	2.77	2.65	2.80
1994	2.61	2.51	2.52	2.51	2.36	2.42	2.61	2.72	2.81	2.92	2.96	2.81	2.65
1995	2.77	2.73	2.71	2.60	2.52	2.48	2.40	2.50	2.56	2.62	2.69	2.56	2.59
1996	2.59	2.42	2.35	2.17	2.10	2.17	2.19	2.28	2.64	2.98	2.85	2.70	2.45
1997	2.44	2.35	2.27	2.14	2.07	2.12	2.24	2.35	2.44	2.63	2.73	2.80	2.38
1998	2.75	2.77	2.73	2.70	2.58	2.89	3.00	3.60	3.98	4.18	4.22	4.27	3.31
						Turkey - Feed Ratio 4/							
1988	6.2	5.5	5.2	5.0	4.9	4.5	5.3	5.6	6.2	6.7	6.7	5.3	5.6
1989	4.8	5.3	5.5	5.9	6.1	6.3	6.1	6.6	6.0	6.4	6.8	6.5	6.0
1990	5.9	5.7	6.1	5.9	6.0	6.2	6.4	6.7	7.0	7.6	7.7	6.7	6.5
1991	6.0	6.3	6.4	6.5	6.7	6.9	7.2	7.1	7.0	6.5	6.4	6.5	6.6
1992	6.0	5.8	6.0	6.0	6.0	6.1	6.5	6.8	6.7	7.1	7.2	7.1	6.4
1993	6.3	6.4	6.6	6.5	6.6	6.7	6.4	6.4	6.9	7.2	6.7	6.0	6.5

1994 :	5.4	5.4	5.5	5.8	5.9	6.1	6.9	7.4	7.4	7.9	7.9	7.3
6.6												
1995 :	6.8	6.4	6.5	6.4	6.3	6.3	6.0	6.3	6.4	6.4	6.5	5.7
6.3												
1996 :	5.3	5.2	5.1	4.8	4.6	4.9	4.9	4.8	5.3	6.2	6.4	6.1
5.3												
1997 :	5.4	5.1	5.0	5.1	5.3	5.6	6.0	5.9	6.1	6.2	6.2	5.8
5.7												
1998 :	5.4	5.2	5.4	5.7	5.8	6.1	6.5	7.6	8.1	8.3	8.2	7.5
6.7												
:												
:												
:	Steer & Heifer-Corn Feed Ratio 5/											
:												
1988 :	39.0	39.0	39.0	39.0	38.0	29.2	24.7	26.4	27.6	28.1	29.1	28.9
32.3												
1989 :	29.2	29.2	29.7	29.4	28.7	28.5	29.0	32.6	31.4	33.1	33.8	33.4
30.7												
1990 :	34.1	33.8	32.9	31.5	29.9	29.4	29.2	31.5	34.0	36.6	37.6	36.6
33.1												
1991 :	36.0	35.0	34.5	33.9	33.4	33.2	32.9	30.6	30.7	32.2	31.6	30.7
32.9												
1992 :	30.3	31.0	30.7	30.8	30.2	29.8	31.7	34.7	35.0	37.3	38.2	38.7
33.2												
1993 :	38.8	39.8	38.8	37.8	37.8	37.1	33.8	33.4	33.7	31.8	29.8	27.0
35.0												
1994 :	27.0	26.2	27.5	28.5	26.8	24.8	28.4	31.6	30.2	32.1	34.4	31.9
29.1												
1995 :	32.6	32.3	30.6	28.2	26.3	25.2	23.5	23.5	23.0	22.3	22.7	21.1
25.9												
1996 :	20.3	18.1	17.2	15.1	13.9	14.2	14.0	15.0	191	23.6	25.8	24.9
18.4												
1997 :	24.2	24.6	24.3	24.3	25.4	25.4	27.0	26.6	26.6	26.5	27.1	26.5
25.7												
1998 :	25.8	24.8	25.2	27.5	28.3	28.3	27.9	31.6	32.2	32.1	32.3	30.0
28.8												

1/ Modifications in the calculation of feed price ratio are a result of Prices
Paid program changes initiated in January 1995, using a different procedure.
NASS uses fixed composition rations common to dairy and poultry production
as established by University Animal Nutritionists'. The methodology utilizes major raw feed component prices from the NASS agricultural commodity prices published monthly. The major feed components of corn and
soybeans account for 83 to 91 percent of the total ingredients in the rations. See footnotes 3/, 4/, 7/, and 8/ for Ration Composition per 100
pounds. The contribution for feed additives and antibiotics are held constant.

2/ Simple average of monthly ratios for calendar year.

Feed Price Ratios, Monthly, United States,
January 1988 - December 1998 1/

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average 2/
					Hog-Corn Feed Ratio 6/								
1988	24.3	25.0	22.7	22.3	23.9	19.5	16.2	16.9	15.7	15.0	14.4	15.7	19.3
1989	15.7	15.6	15.1	14.4	16.1	17.9	18.6	20.1	19.0	21.0	20.1	21.2	17.9
1990	20.5	20.8	21.6	21.4	23.4	22.9	23.2	23.3	23.4	25.9	23.2	21.5	22.5
1991	22.0	22.5	21.5	21.0	22.7	23.7	23.9	22.0	19.9	18.9	16.6	16.6	20.9
1992	15.3	16.3	15.7	16.5	18.1	18.9	19.1	20.5	19.5	20.5	20.8	21.2	18.5
1993	20.3	22.0	22.1	21.0	21.9	23.0	20.6	21.0	21.6	20.6	17.3	15.1	20.5
1994	16.1	17.2	16.2	16.1	16.4	16.4	18.4	19.4	16.2	15.4	14.1	14.5	16.4
1995	16.8	17.5	16.4	15.1	15.3	16.8	17.6	18.5	18.0	16.4	13.9	14.2	16.4
1996	13.8	13.8	13.9	12.9	13.7	13.4	13.2	13.9	15.4	19.3	20.5	21.1	15.4
1997	20.0	19.9	17.7	19.2	21.6	22.6	24.3	22.1	20.0	18.6	18.0	16.5	20.0
1998	14.1	14.1	13.7	14.8	18.1	18.6	16.8	18.6	16.1	14.6	9.7	7.3	14.7
					Market Egg-Feed Ratio 7/								
1988	8.2	7.5	8.0	6.9	6.0	5.5	6.9	7.1	8.3	7.7	8.0	8.2	7.3
1989	8.3	8.2	11.1	9.0	8.4	8.8	9.2	11.6	11.8	12.1	13.6	14.3	10.5
1990	14.3	11.5	13.0	11.0	8.5	9.0	7.9	9.9	10.9	12.1	12.4	12.3	11.1
1991	13.2	11.1	12.6	10.0	8.6	8.8	10.4	9.8	9.4	9.7	9.9	11.2	10.4
1992	8.4	7.8	7.4	7.6	6.7	7.0	7.3	8.1	9.6	9.3	11.2	11.1	8.4

1993	10.5	10.3	11.7	10.6	9.1	9.8	8.2	8.9	8.1	8.8	8.8	8.2
9.4												
1994	7.9	8.0	8.4	7.7	7.2	7.0	8.0	9.0	9.2	8.9	10.3	9.9
8.5												
1995	9.4	9.3	9.0	8.9	7.5	7.6	8.0	8.5	8.9	8.6	10.1	10.0
8.8												
1996	9.8	8.7	9.1	7.9	6.5	6.7	6.3	6.9	8.1	9.3	11.3	12.5
8.6												
1997	10.1	9.9	8.6	7.4	7.1	6.6	8.2	7.8	9.3	8.7	11.4	11.0
8.8												
1998	10.1	8.3	9.4	8.5	6.7	8.0	7.9	10.8	10.7	11.3	12.6	12.8
9.7												
				Broiler-Feed Ratio 8/								
1988	4.6	4.3	4.4	4.4	4.9	4.5	4.7	4.9	4.7	4.5	4.5	4.5
4.6												
1989	4.3	4.4	4.9	5.0	5.8	5.6	5.3	5.4	5.7	4.9	4.7	4.4
5.0												
1990	4.7	5.3	5.6	4.9	5.1	5.0	5.3	4.8	5.2	4.4	4.4	4.6
4.9												
1991	4.8	4.8	4.6	4.7	4.8	5.0	5.3	5.1	5.0	5.0	4.8	4.7
4.9												
1992	4.7	4.6	4.6	4.5	4.9	4.7	5.4	5.7	5.3	5.7	5.7	5.4
5.1												
1993	5.3	5.4	5.4	5.4	5.6	5.6	5.2	5.3	5.5	5.3	5.0	4.6
5.3												
1994	4.5	4.5	4.7	4.8	5.1	5.1	5.6	5.7	5.8	5.8	5.6	5.4
5.2												
1995	5.3	5.3	5.2	5.1	5.0	5.0	5.1	5.5	5.5	5.1	5.0	4.6
5.1												
1996	4.7	4.2	4.0	3.8	3.9	4.3	4.1	4.1	4.4	5.0	5.3	5.4
4.4												
1997	5.0	4.8	4.4	42	4.2	4.5	5.1	5.2	5.2	4.8	4.6	4.4
4.7												
1998	4.6	4.7	5.0	5.3	5.5	6.1	6.7	8.1	8.2	7.7	7.1	6.7
6.3												

3/ Number of pounds of 16 percent protein mixed dairy feed (corn-51 pounds, soybeans-8 pounds, alfalfa hay-41 pounds) equal in value to one pound of all milk.

4/ Number of pounds of turkey grower feed (corn-51 pounds, soybeans-28 pounds, all wheat-21 pounds) equal in value to one pound of turkey, live weight.

5/ Number bushels of corn equal in value to 100 pounds of steer & heifers, live weight.

6/ Number of bushels of corn equal in value to 100 pounds of all hogs, live

weight.
7/ Number of pounds of laying feed (corn-75 pounds, soybeans-25 pounds) equal
in value to one dozen market eggs.
8/ Number of pounds of broiler grower feed (corn-58 pounds, soybeans-42 pounds)
equal in value to one pound of broiler, live weight.

Prices Paid: Fuels, Regions and United States, April 1995-98

Region 1/	Gasoline, Unleaded 2/							
	Pumped at Service Station				Bulk Delivery			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Gallon							
Appalachian	1.11	1.20	1.21	1.03	1.09	1.24	1.24	1.06
Corn Belt	1.10	1.20	1.17	1.03	1.11	1.27	1.25	1.10
Delta States	1.10	1.18	1.21	1.03	1.05	1.20	1.20	1.04
Lake States	1.15	1.27	1.22	1.09	1.16	1.32	1.30	1.16
Mountain	1.19	1.27	1.32	1.16	1.18	1.29	1.34	1.17
Northeast	1.15	1.23	1.26	1.08	1.17	1.30	1.33	1.17
Northern Plains	1.15	1.26	1.26	1.08	1.12	1.31	1.30	1.13
Pacific	1.22	1.36	1.41	1.18	1.19	1.43	1.46	1.23
Southeast	1.10	1.20	1.21	1.03	1.09	1.18	1.19	1.02
Southern Plains	1.10	1.20	1.20	1.03	1.07	1.22	1.22	1.05
United States	1.12	1.22	1.23	1.06	1.11	1.26	1.26	1.09

Prices Paid: Fuels, Regions and United States, April 1995-98

Region 1/	Diesel Fuel, Bulk Delivery, 3/ 4/				L.P. Gas (Propane, Butane, etc.), Bulk Delivery, 3/ 4/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Gallon							
Appalachian	0.770	0.880	0.890	0.760	0.960	0.990	1.01	0.900
Corn Belt	0.780	0.940	0.880	0.750	0.700	0.790	0.800	0.730
Delta States	0.670	0.820	0.760	0.650	0.880	0.930	0.990	0.900
Lake States	0.830	0.980	0.910	0.790	0.720	0.800	0.840	0.740
Mountain	0.770	0.890	0.940	0.770	0.700	0.760	0.810	0.720
Northeast	0.850	1.02	0.960	0.810	1.10	1.17	1.21	1.05
Northern Plains	0.740	0.920	0.840	0.710	0.570	0.660	0.690	0.620
Pacific	0.810	1.00	1.04	0.820	0.980	1.00	1.16	0.920
Southeast	0.780	0.900	0.830	0.720	0.710	0.810	1.02	0.900
Southern Plains	0.700	0.860	0.790	0.680	0.720	0.770	0.810	0.740
United States	0.766	0.920	0.874	0.740	0.734	0.804	0.852	0.764

1/ Description of farm production regions on page B-53.
2/ Includes Federal, State, and local per gallon taxes.
3/ Excludes state road taxes, but includes applicable state and local per gallon taxes.
4/ Excludes federal excise tax.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Alfalfa Meal				Alfalfa Pellets			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Cwt							
Appalachian	12.50	14.20	14.70	15.70	13.50	15.10	15.30	15.70
Corn Belt	11.80	11.80	13.30	13.50	11.60	12.00	13.10	13.40
Delta States	11.40	11.40	13.00	13.70	12.50	12.80	13.00	13.00
Lake States	11.70	12.10	13.40	13.40	12.00	12.30	13.40	13.60
Mountain	10.60	12.30	13.50	14.20	11.00	11.50	12.50	12.60
Northeast	12.80	13.90	15.70	16.10	13.90	14.60	16.30	16.50
Northern Plains	9.80	9.90	11.40	11.40	9.50	9.70	10.80	10.80
Pacific	14.20	15.20	16.70	16.40	13.50	13.40	14.50	14.60
Southeast	12.30	13.50	13.10	13.90	13.20	13.80	14.40	14.80
Southern Plains	12.10	12.00	13.40	13.30	11.70	12.20	12.90	12.90
United States	11.80	12.30	13.60	13.80	12.00	12.40	13.40	13.60

Prices Paid: Feed, Regions and United States, April 1995-98

	Bran				Beef Cattle 32-36% Protein Concentrate,			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Cwt							
Appalachian	12.50	14.20	14.70	15.70	13.50	15.10	15.30	15.70
Corn Belt	11.80	11.80	13.30	13.50	11.60	12.00	13.10	13.40
Delta States	11.40	11.40	13.00	13.70	12.50	12.80	13.00	13.00
Lake States	11.70	12.10	13.40	13.40	12.00	12.30	13.40	13.60
Mountain	10.60	12.30	13.50	14.20	11.00	11.50	12.50	12.60
Northeast	12.80	13.90	15.70	16.10	13.90	14.60	16.30	16.50
Northern Plains	9.80	9.90	11.40	11.40	9.50	9.70	10.80	10.80
Pacific	14.20	15.20	16.70	16.40	13.50	13.40	14.50	14.60
Southeast	12.30	13.50	13.10	13.90	13.20	13.80	14.40	14.80
Southern Plains	12.10	12.00	13.40	13.30	11.70	12.20	12.90	12.90
United States	11.80	12.30	13.60	13.80	12.00	12.40	13.40	13.60

Region 1/	Corn Meal				Cottonseed Meal, 41% Protein			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Cwt				Dollars per Ton			
Appalachian	11.80	13.60	13.90	13.80	273	328	321	276
Corn Belt	10.30	11.90	13.70	13.10	270	331	360	303
Delta States	12.30	13.30	13.80	14.00	246	262	263	258
Lake States	9.70	11.80	12.90	12.80	266	339	364	305
Mountain	12.90	13.40	14.90	14.10	253	326	321	282
Northeast	10.00	12.50	13.20	12.60	255	287	324	293
Northern Plains	10.20	12.30	13.10	13.20	251	304	310	286
Pacific	14.80	15.70	17.20	17.10	242	334	343	340
Southeast	13.00	15.60	16.10	15.40	242	315	293	288
Southern Plains	12.00	15.00	15.40	15.10	225	282	272	262
United States	11.20	13.00	14.20	13.80	251	316	325	292

1/ Description of farm production regions on page B-53.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Corn Meal				Cottonseed Meal, 41% Protein			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Cwt							

Appalachian	7.70	10.30	9.20	8.60	13.60	16.30	17.00
15.90							
Corn Belt	6.80	9.90	8.50	7.20	14.80	16.60	17.10
15.50							
Delta States	8.50	11.50	9.70	9.10	12.00	14.40	14.50
13.90							
Lake States	6.30	8.70	7.30	6.70	17.40	17.10	16.70
17.60							
Mountain	9.90	11.50	10.30	10.90	16.30	18.40	18.50
18.80							
Northeast	8.40	11.30	10.90	10.20	11.00	13.50	13.50
11.50							
Northern Plains	6.40	9.70	7.80	7.60	11.90	13.20	14.50
12.80							
Pacific	12.00	13.40	12.90	12.50	17.90	21.10	22.10
20.30							
Southeast	9.80	11.80	10.60	10.10	13.70	16.30	16.60
15.00							
Southern Plains	8.60	11.80	10.60	9.40	12.00	14.30	14.90
13.70							
United States	7.86	10.60	9.30	8.57	14.20	16.80	17.20
16.00							

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Dairy Feed, 14% Protein 2/				Dairy Feed, 16% Protein 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
Appalachian					174	211	209	185
Corn Belt	173	222	206	180	181	240	229	203

Delta States	157	203	187	173	168	212	203	185
Lake States	161	218	200	182	172	226	212	190
Mountain	181	247	238	209	195	252	251	228
Northeast					175	226	216	199
Northern Plains	148	217	212	192	168	235	221	202
Pacific	155	202	187	182	162	210	187	174
Southeast	144	192	190	179	169	239	246	209
Southern Plains	164	223	221	204	190	227	226	209
United States	162	216	202	186	174	225	215	194

1/ Description of farm production regions on page B-53.
2/ Complete ration feed, fed without mixing or supplementation.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Dairy Feed, 18% Protein 2/				Dairy Feed, 20% Protein 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
Appalachian	177	220	229	192	181	221	217	188
Corn Belt	194	262	247	224	201	262	265	225
Delta States	178	216	213	202	183	209	209	196
Lake States								
Mountain								
Northeast	183	236	229	204	187	243	243	211
Northern Plains								
Pacific								

Southeast	178	238	216	202	173	224	212	192
Southern Plains								
United States	183	238	230	206	186	239	238	207

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Dairy Concentrate 32% Protein				Hog Feed, 14-18% Protein 2/ 3/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
Appalachian	277	312	338	298	228	268	262	255
Corn Belt	295	357	379	321	209	248	250	221
Delta States	241	290	311	262	214	263	244	230
Lake States	284	353	379	309	199	241	243	213
Mountain	264	305	361	318	242	272	284	270
Northeast	255	289	334	278	207	254	256	241
Northern Plains	288	336	362	314	182	262	246	234
Pacific	251	278	293	290	200	254	243	224
Southeast	241	309	306	278	235	290	280	262
Southern Plains	211	261	277	248	222	264	273	255

United States	276	333	362	302	210	252	252	227

1/ Description of farm production regions on page B-53.
2/ Complete ration feed, fed without mixing or supplementation.
3/ Excluding pig starter.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Hog Concentrate 38-42% Protein				Stock Salt			
	1995	1996	1997	1998	1995	1996	1997	1998
	---- Dollars per Ton ----				---- Dollars per 50 LB ----			
Appalachian	320	357	386	349	4.50	4.60	4.60	4.80
Corn Belt	288	352	389	306	3.70	3.80	4.00	3.90
Delta States	290	345	366	321	3.30	3.30	3.30	3.30
Lake States	287	339	393	300	3.80	3.90	3.90	3.90
Mountain	338	384	438	401	3.60	3.70	3.70	3.80
Northeast	298	356	407	366	5.30	5.10	5.40	5.50
Northern Plains	280	340	371	333	2.70	2.80	2.80	2.80
Pacific	296	326	343	333	3.70	3.80	4.00	4.10
Southeast	311	368	403	372	4.10	4.20	4.20	4.10
Southern Plains	300	349	377	351	3.50	3.50	3.50	3.50
United States	292	351	389	317	3.76	3.82	3.92	3.91

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Liquid Molasses 2/				Broiler Grower 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	----- Dollars per Cwt -----				---- Dollars per Ton ----			
Appalachian	11.10	13.20	13.00	12.90	208	264	283	284
Corn Belt	13.40	13.70	14.90	14.20	251	315	297	264
Delta States	9.00	9.40	9.10	9.00	198	261	240	240
Lake States	11.50	11.60	11.50	12.00	242	307	319	276
Mountain	11.80	13.80	13.40	12.80				
Northeast	9.20	9.40	9.40	9.40	199	291	293	273
Northern Plains	9.20	9.70	10.40	9.90				
Pacific	15.40	15.80	14.40	14.20	190	299	286	271
Southeast	9.30	9.60	10.20	10.20	170	238	258	246
Southern Plains	8.10	8.50	8.80	8.70	247	309	351	291
United States	11.30	11.80	12.20	11.90	195	265	270	257

1/ Description of farm production regions on page B-53.
2/ Complete ration feed, fed without mixing or supplementation.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Chick Starter 2/				Laying Feed 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
Appalachian	237	315	272	262	197	243	223	214
Corn Belt	251	322	322	284	207	272	273	225
Delta States	211	285	265	245	169	238	224	184
Lake States	261	326	324	285	204	279	273	237
Mountain					235	273	271	256
Northeast	199	293	297	280	199	243	260	216
Northern Plains					215	266	251	240
Pacific	181	309	304	299	184	282	240	236
Southeast	202	246	283	269	192	234	239	226
Southern Plains	236	286	304	296	204	276	266	245
United States	212	280	284	268	195	258	251	224

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	Turkey Grower 2/				Soybean Meal, 44% Protein			
	1995	1996	1997	1998	1995	1996	1997	1998
	---- Dollars per Ton ----				----- Dollars per Cwt			

	:							
Appalachian	:	223	280	264	241	13.50	16.60	18.50
17.10								
Corn Belt	:	236	313	314	272	10.80	14.50	16.70
12.00								
Delta States	:	248	335	311	310	13.40	15.70	17.70
16.20								
Lake States	:	252	296	297	263	10.10	14.40	16.40
11.50								
Mountain	:	261	317	319	283	18.00	19.80	22.70
21.30								
Northeast	:	238	299	287	269	12.80	15.80	18.00
14.20								
Northern Plains	:	248	329	302	262	11.10	14.50	16.50
13.00								
Pacific	:	238	335	309	283	20.60	22.00	24.00
21.90								
Southeast	:	251	294	305	313	15.20	17.50	19.70
17.40								
Southern Plains	:	254	353	356	363	14.20	16.70	18.40
17.20								
United States	:	242	312	305	278	12.40	15.60	17.70
14.30								

1/ Description of farm production regions on page B-53.
2/ Complete ration feed, fed without mixing or supplementation.

Prices Paid: Feed, Regions and United States, April 1995-98

Region 1/	: Trace Mineral Blocks			
	: 1995	1996	1997	1998
	: Dollars per 50 Lb.			
	:			
Appalachian	: 5.20	5.20	5.30	5.30
Corn Belt	: 4.90	5.00	5.40	5.10
Delta States	: 4.50	4.60	4.50	4.50
Lake States	: 4.80	4.80	4.90	4.90

Mountain	4.50	4.50	4.70	4.90	
Northeast	6.70	6.60	6.70	6.60	
Northern Plains	4.10	4.20	4.20	4.20	
Pacific	4.60	4.70	4.70	4.90	
Southeast	4.70	4.80	4.80	4.70	
Southern Plains	4.60	4.60	4.50	4.60	
United States	4.85	4.90	5.05	4.98	

1/ Description of farm production regions on page B-53.

Prices Paid: Feed, United States, April 1993-98

Item	Unit	1993	1994	1995	1996	1997	1998
				Dollars			
Alfalfa Meal	Cwt	11.10	12.00	11.80	12.30	13.60	13.80
Alfalfa Pellets	Cwt	11.20	12.20	12.00	12.40	13.40	13.60
Bran	Cwt	10.90	11.30	11.20	13.00	14.20	13.80
Beef Cattle Conc.							
32-36% Protein	Ton	261	275	251	316	325	292
Corn Meal	Cwt	7.18	8.03	7.86	10.60	9.30	8.57
Cottonseed Meal, 41%	Cwt	14.60	15.70	14.20	16.80	17.20	16.00
Dairy Feed							
14% Protein 1/	Ton	167	171	162	216	202	186
16% Protein 1/	Ton	179	187	174	225	215	194
18% Protein 1/	Ton	184	197	183	238	230	206
20% Protein 1/	Ton	187	198	186	239	238	207

32% Protein Conc.	Ton	285	304	276	333	362	302
Hog Feed							
14-18% Protein 1/ 2/	Ton	198	219	210	252	252	227
38-42% Protein Conc.	Ton	305	317	292	351	389	317
Molasses, Liquid	Ton	10.30	11.00	11.30	11.80	12.20	11.90
Poultry Feed							
Broiler Grower 1/	Ton	209	224	195	265	270	257
Chick Starter 1/	Ton	224	234	212	280	284	268
Laying Feed 1/	Ton	201	215	195	258	251	224
Turkey Grower 1/	Ton	248	257	242	312	305	278
Soybean Meal, 44%	Cwt	13.20	14.10	12.40	15.60	17.70	14.30
Stock Salt	50 Lb	3.57	3.74	3.76	3.82	3.92	3.91
Trace Mineral Blocks	50 Lb	3/	4.78	4.85	4.90	5.05	4.98

1/ Complete ration feed, fed without mixing or supplementation.
2/ Excluding pig starter.
3/ Not surveyed.

Prices Paid: Chicks and Turkey Poults, By Type,
United States, Annual Average 1993-98

Year	Chicks: Broiler Type Straight-Run	Chicks: Egg-Type Pullets	Turkey Poults
	Dollars Per 100		Dollars Per Poult
1993	18.60	53.80	1.05
1994	19.30	49.70	1.06
1995	18.60	49.80	1.06
1996	18.60	53.80	1.10
1997	19.70	53.10	1.08

1998	20.40	54.50	1.15

Prices Paid : Feeder and Stocker Cattle and Calves,
United States, 1993-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt											
1993	89.00			89.60			89.50			87.70		
1994	86.30			83.30			77.80			74.30		
1995	78.60	74.80	70.40	66.50	64.40	66.90	66.90	66.30	65.80	65.00	62.20	64.00
1996	59.10	57.70	56.00	52.70	54.20	58.20	60.60	61.50	63.70	61.20	63.60	63.80
1997	67.70	70.90	71.30	75.00	77.50	77.80	83.20	80.60	80.70	79.80	79.40	81.50
1998	80.50	80.30	78.00	80.30	77.50	73.70	68.70	69.40	66.00	71.80	72.50	71.70

Prices Paid: Feeder Pigs,
United States, 1993-98

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Dollars per Cwt											
1993	76.50			107			76.00			87.00		
1994	67.50			95.00			59.50			45.50		
1995	56.00			77.50			55.00			67.50		
1996	61.50	67.00	74.00	72.00	67.00	62.00	58.50	79.00	82.50	96.50	102	103
1997	103	108	111	125	118	109	109	100	89.00	80.00	74.50	70.50
1998	62.50	74.00	62.50	64.00	66.50	64.00	1/					

1/Monthly Feeder pig price discontinued.

Prices Paid: Feeder Pigs, Major States 1/, 1996-98 2/

	1996			1997				1998 3/			
	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
	Dollars Per Cwt											
GA	60.00	56.50	61.00	81.50	78.50	83.50	66.00	76.00	65.00	58.00	41.00	35.00
IL	71.00	77.00	85.00	99.00	115.00	121.00	107.00	90.00	82.50	79.50	59.00	42.50
IN	76.50	83.50	88.00	102.00	122.00	122.00	106.00	91.00	82.50	80.00	66.00	48.00
IA	79.00	81.00	92.50	106.00	115.00	128.00	111.00	95.50	91.00	81.00	67.00	52.00
KS	60.50	78.50	89.00	100.00	115.00	134.00	106.00	73.50	70.50	83.00	49.00	33.50
KY	58.00	50.00	72.50	79.00	117.00	110.00	85.50	68.00	59.00	58.00	39.00	22.00
MI	79.50	83.00	74.50	88.00	101.00	102.00	97.50	89.50	85.00	87.00	66.50	53.00
MN	76.50	93.00	97.00	108.00	122.00	131.00	110.00	97.00	94.00	88.50	64.50	63.00
MO	64.00	57.00	73.00	83.50	107.00	114.00	96.00	73.00	86.00	66.00	60.00	36.00
NE	81.00	83.50	93.00	98.00	120.00	122.00	113.00	92.50	81.00	82.50	68.50	46.00
NC	75.50	75.50	73.50	78.50	95.50	103.00	91.00	78.50	85.00	79.00	64.00	35.00
OH	64.50	69.00	82.00	95.50	117.00	119.00	102.00	88.50	86.50	82.00	58.00	50.00
PA	84.50	96.00	97.00	109.00	106.00	115.00	99.00	86.00	76.00	75.00	70.00	37.00
SD	70.00	76.00	87.00	102.00	106.00	110.00	107.00	92.50	80.00	72.00	59.00	48.00
WI	72.50	78.00	78.00	90.00	117.00	118.00	97.00	86.00	75.50	74.00	50.00	32.00

1/ Based on survey data reported by producers, except Kentucky where administrative data are used.
2/ Entire month.
3/ Data series discontinued for 1999.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	0-15-40 2/				0-18-36 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central					177	184	180	190
Mountain								
North Central	179	186	182	189				
Northeast								
Northern Plains								
Northwest								
South Central					177	182	180	192
Southeast								
Southwest								
United States	179	186	182	189	177	183	180	191

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	0-20-20 2/				3-10-30 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	190	198	184	198				
Mountain								
North Central					167	170	164	165
Northeast	193	198	204	205				

Northern Plains	:						
Northwest	:						
South Central	: 180	195	196	187			
Southeast	: 161	176	174	184			
Southwest	:						
United States	: 184	194	185	195	167	170	164 165

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	5-10-10 2/				5-10-15 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	:				164	172	163	167
Mountain	:							
North Central	:							
Northeast	: 165	179	158	158				
Northern Plains	:							
Northwest	:							
South Central	:							
Southeast	: 147	151	152	146	157	171	157	167
Southwest	:							
United States	: 150	155	153	148	159	171	159	167

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

	5-10-30 2/	5-20-20 2/

Region 1/	6-6-6 2/				6-6-18 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central					179	196	185	190
Mountain								
North Central								
Northeast								
Northern Plains								
Northwest								
South Central								
Southeast	170	181	174	177				
Southwest								
United States	170	181	174	177	179	196	185	190

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	6-6-6 2/				6-6-18 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								
Mountain								
North Central								
Northeast								
Northern Plains								
Northwest								
South Central								
Southeast	192	175	178	188	197	193	193	214
Southwest								

United States	192	175	178	188	197	193	193 214

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	6-12-12 2/				6-24-24 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	159	167	159	156	220	221	206	217
Mountain								
North Central					218	232	225	228
Northeast					232	236	234	243
Northern Plains								
Northwest								
South Central								
Southeast								
Southwest								
United States	159	167	159	156	219	232	224	228

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	8-8-8 2/				8-20-5 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								
Mountain								
North Central								
Northeast								
Northern Plains					202	215	218	218
Northwest								
South Central								
Southeast	155	161	160	155				
Southwest					217	217	220	230
United States	155	161	160	155	213	217	219	226

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	8-32-16 2/				9-23-30 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								

Mountain	:							
North Central	:	235	249	240	235	207	220	210 214
Northeast	:							
Northern Plains	:	233	265	236	242			
Northwest	:							
South Central	:							
Southeast	:							
Southwest	:							
United States	:	235	251	239	236	207	220	210 214

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	: 10-3-3 2/				: 10-6-4 2/			
	: 1995	1996	1997	1998	: 1995	1996	1997	: 1998
	: Dollars per Ton							
E South Central	:							
Mountain	: 110	146	146	3/				
North Central	:							
Northeast	:				163	181	180	164
Northern Plains	:							
Northwest	:							
South Central	:							
Southeast	:							
Southwest	:							
United States	: 110	146	146	3/	163	181	180	164

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	10-10-10 2/				10-20-10 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	151	148	148	145				
Mountain								
North Central					196	207	217	206
Northeast	179	178	178	176	220	227	217	217
Northern Plains								
Northwest								
South Central					195	212	203	192
Southeast	177	180	179	179				
Southwest								
United States	172	176	173	172	204	217	209	202

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.
3/ Insufficient data.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

	10-20-20 2/				10-34-0 2/			

Region 1/	11-52-0 2/				13-13-13 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								
Mountain					261	257	263	270
North Central					246	252	251	254
Northeast	223	228	225	225	287	288	260	275
Northern Plains					247	247	247	253
Northwest					304	301	296	314
South Central					239	236	229	238
Southeast	218	223	221	217				
Southwest					268	283	281	291
United States	221	226	224	222	252	255	253	260

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	11-52-0 2/				13-13-13 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							

E South Central					200	207	195
201							
Mountain	272	305	286	278			
North Central	269	307	278	273	214	223	223
210							
Northeast	289	301	286	279			
Northern Plains	261	294	269	263			
Northwest	302	332	318	315			
South Central					193	194	188
183							
Southeast							
Southwest	320	349	342	334			
United States	278	310	289	283	200	205	196
197							

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	15-15-15 2/				16-0-13 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	201	209	201	198				
Mountain								
North Central					165	171	175	160
Northeast	229	233	230	220				
Northern Plains								
Northwest								
South Central								
Southeast								
Southwest	334	348	356	345				
United States	235	242	239	231	165	171	175	160

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	16-4-8 2/				16-6-12 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								
Mountain								
North Central								
Northeast								
Northern Plains								
Northwest								
South Central					186	184	177	170
Southeast	226	231	230	236				
Southwest								
United States	226	231	230	236	186	184	177	170

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

	16-16-16 2/	16-20-0 2/

Region 1/	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central								
Mountain					216	232	216	215
North Central								
Northeast								
Northern Plains					220	241	251	256
Northwest	266	290	272	279	243	259	244	251
South Central					220	216	210	203
Southeast								
Southwest					259	290	278	280
United States	266	290	272	279	242	259	247	250

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	17-17-17 2/				18-46-0 (DAP)			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central					265	286	265	264

Mountain	:					273	303	289
283								
North Central	:					262	297	277
266								
Northeast	:					284	297	283
271								
Northern Plains	:					258	283	257
253								
Northwest	:					320	357	304
308								
South Central	:	217	224	211	202	254	278	250
247								
Southeast	:	224	240	232	221	272	302	278
274								
Southwest	:					321	358	340
334								
United States	:	222	236	226	216	263	294	272
264								

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer Blends, Regions and United States, April 1995-98

Region 1/	19-19-19 2/				24-8-0 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	229	239	223	218				
Mountain								
North Central	234	244	232	218				
Northeast	255	243	255	246				
Northern Plains								
Northwest								
South Central					207	189	180	162
Southeast								
Southwest								

United States	240	242	233	222	207	189	180	162

Prices Paid: Nitrogenous Fertilizer Materials,
Regions and United States, April 1995-98

Region 1/	Ammonium Nitrate, 33.5% Nitrogen				Anhydrous Ammonia, 82% Nitrogen 2/			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	220	235	222	191	335	309	301	249
Mountain	223	229	233	199	335	319	313	261
North Central	218	220	218	179	335	309	314	256
Northeast	259	263	270	217				
Northern Plains	206	225	226	181	323	287	288	237
Northwest	235	253	244	201	446	419	391	381
South Central	214	216	211	180	298	267	266	222
Southeast	236	249	242	222	368	340	307	252
Southwest	254	284	286	259	327	381	359	353
United States	223	233	227	193	330	303	303	253

1/ Description of fertilizer regions on page B-54.

2/ Items left blank were not surveyed.

Prices Paid: Nitrogenous Fertilizer Materials and Soil Conditioner,
Regions and United States, April 1995-98

Region 1/	Aqua Ammonia, 22%-25% Nitrogen				Limestone, Ground, Spread on field			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central					21.20	21.90	20.70	21.00
Mountain								
North Central					13.40	13.00	13.70	13.70
Northeast					22.30	23.30	27.60	29.80
Northern Plains								
Northwest	123	117	110	121				
South Central					24.40	23.90	25.70	26.60
Southeast					28.10	25.70	26.30	27.10
Southwest	101	111	111	116				
United States	109	113	111	118	17.90	17.50	18.20	18.50

Prices Paid: Potash and Nitrogenous Fertilizer Materials
Regions and United States, April 1995-98

Region 1/	Muriate of Potash, (Potassium Chloride) 2/ 60-62% K2O				Nitrate of Soda, 2/ 16% Nitrogen			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	167	159	153	167	251	259	266	276
Mountain	165	163	162	167				
North Central	152	151	150	161				
Northeast								
Northern Plains	157	153	154	160				
Northwest	188	185	181	198				
South Central	151	147	147	159				
Southeast	170	167	166	180	247	255	265	264
Southwest								
United States	155	153	152	163	248	256	265	266

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Nitrogenous Fertilizer Materials,
Regions and United States, April 1995-98

Region 1/	Nitrogen Solution, 2/ 28% Nitrogen				Nitrogen Solution, 2/ 30% Nitrogen			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	158	158	146	125				

Mountain	:							
North Central	:	158	171	153	129			
Northeast	:					202	209	172
144								
Northern Plains	:	161	158	150	122			
Northwest	:							
South Central	:	159	155	151	131			
Southeast	:					164	177	158
133								
Southwest	:	206	254	234	206			
United States	:	162	171	157	133	169	182	160
134								

Prices Paid: Nitrogenous Fertilizer Materials
Regions and United States, April 1995-98

Region 1/	: Nitrogen Solution, 2/ 32% Nitrogen				: Sulfate of Ammonia, 2/ 20.5%-21.0% Nitrogen			
	: 1995	1996	1997	1998	: 1995	1996	1997	: 1998
	: Dollars per Ton							
E South Central	: 161	164	151	129				
Mountain	:				194	192	197	196
North Central	: 181	183	176	145	182	182	181	179
Northeast	:							
Northern Plains	: 188	181	174	144				
Northwest	: 226	233	224	204	187	186	187	202
South Central	: 173	171	162	140	171	158	162	153
Southeast	: 178	181	160	144				

Southwest	:	218	237	223	197	183	200	199
195								
United States	:	183	185	175	148	182	184	185
187								

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Phosphate and Nitrogenous Fertilizer Materials, Regions and United States, April 1995-98

Region 1/	Triple Superphosphate, 44%-46% P205				Urea, 2/ 45%-46% Nitrogen			
	1995	1996	1997	1998	1995	1996	1997	1998
	Dollars per Ton							
E South Central	233	254	244	250	267	271	245	185
Mountain	251	263	274	267	270	285	272	199
North Central	230	256	255	248	260	274	257	194
Northeast	254	265	266	264	316	325	287	221
Northern Plains	228	266	253	241	267	273	247	183
Northwest	268	282	267	287	285	312	312	237
South Central	225	241	238	233	260	265	233	182
Southeast	232	257	268	267				
Southwest	326	323	337	338	315	351	342	280
United States	234	258	257	253	266	278	257	195

1/ Description of fertilizer regions on page B-54.
2/ Items left blank were not surveyed.

Prices Paid: Fertilizer and Agricultural Limestone
United States, April 1993-98

Item 1/	1993	1994	1995	1996	1997	1998
			Dollars per Ton			
0-15-40						
0-18-36		168	177	183	180	191
0-20-20	167	173	184	194	185	195
3-10-30		162	167	170	164	165
5-10-10	142	140	150	155	153	148
5-10-15	146	158	159	171	159	167
5-10-30		159	170	181	174	177
5-20-20	155	167	179	196	185	190
6- 6- 6	155	181	192	175	178	188
6- 6-18		203	197	193	193	214
6-12-12	151	148	159	167	159	156
6-24-24	190	200	219	232	224	228
8- 8- 8		148	155	161	160	155
8-20- 5		241	213	217	219	226
8-32-16	199	212	235	251	239	236
9-23-30		186	207	220	210	214
10- 3- 3		130	110	146	146	2/
10- 6- 4		173	163	181	180	164
10-10-10	154	159	172	176	173	172

10-20-10	174	185	204	217	209	202
10-20-20	186	191	221	226	224	222
10-34- 0	217	230	252	255	253	260
11-52- 0	217	233	278	310	289	283
13-13-13	177	184	200	205	196	197
15-15-15	196	205	235	242	239	231
16- 0-13		160	165	171	175	160
16- 4- 8		214	226	231	230	236
16- 6-12		163	186	184	177	170
16-16-16		241	266	290	272	279
16-20- 0	211	224	242	259	247	250
17-17-17		202	222	236	226	216
18-46- 0 (DAP)	199	224	263	294	272	264
19-19-19		205	240	242	233	222
24- 8- 0		161	207	189	180	162
Ammonium Nitrate	186	196	223	233	227	193
Anhydrous Ammonia	213	243	330	303	303	253
Aqua Ammonia	88.90	88.90	109	113	111	118
Limestone, Spread on field:	17.70	17.60	17.90	17.50	18.20	18.50
Muriate of Potash						
60-62% K2O	146	146	155	153	152	163
Nitrate of Soda	238	241	248	256	265	266
Nitrogen Solutions						
28% N	129	138	162	171	157	133
30% N	137	137	169	182	160	134
32% N	141	155	183	185	175	148

Sulfate of Ammonia	157	170	182	184	185 187
Superphosphate, Triple 44-46% P205	190	212	234	258	257 253
Urea 44-46%	202	207	266	278	257 195

1/ Items with blanks were added in April 1994.
2/ Insufficient Data.

Prices Paid: Agricultural Chemicals, United States, April 1995-98

Item 1/	Unit	1995	1996	1997	1998
		Dollars			
Fungicides					
Basic Copper Sulfate 53% WP	Lb	1.24	1.31	1.29	1.28
Benomyl (Benlate), 50% WP	Lb	18.00	18.30	18.20	18.30
Calcium Polysulfide (Lime Sulfur) Liq.Conc	Gal	5.96	5.94	6.14	6.39
Captain 50% WP	Lb	3.31	3.30	3.25	3.36
Chlorothalonil (Bravo), 6#/Gal EC	Gal	52.50	55.90	57.00	55.80
Copper Hydroxide (KOCIDE 101), 77% WP	Lb	2.51	2.58	2.56	2.53
Dodine (Cyprex), 65% WP	Lb	9.18	9.96	9.74	10.40
Ferbam (Carbamate), 76% WP	Lb	4.08	4.20	4.08	3.88
Fosethyl-al (Aliette), 80% WP	Lb	15.40	16.10	13.30	12.70
Iprodione (Rovral), 50% WP	Lb	23.00	23.30	22.80	23.20
Mancozeb (Dithane 80% WP,Manzate 75% DF)	Lb	3.11	3.23	3.32	3.35
Maneb 80% WP	Lb	2.70	2.98	3.13	3.11
Metalaxyl (Ridomil), 2#/Gal EC	Gal	170	172	177	180
Myclobutanil (Systhane, Nova, Rally),					

40% WP	: Lb	: 69.10	73.90	71.90	70.00
Oxytetraycline (Mycoshield), 17% WP	: Lb	: 14.70	15.90	16.20	18.00
	:	:			
Rubigan (Fenarimol), 1#/Gal EC	: Gal	:293	314	301	314
Sulfur 95% WP	: Lb	: 0.348	0.363	0.335	0.305
Triforine (Funginex), 1.6#/Gal EC	: Gal	: 86.90	89.90	91.00	92.70
Triadimefon (Bayleton), 50% WP	: Lb	: 60.10	61.70	63.60	66.70
Ziram 76% WP	: Lb	: 2.78	2.85	2.98	2.88
	:	:			
Fumigants	:	:			
Methl Bromide (Terr-o-gas 98)	: Lb	: 2.85	2.96	3.24	3.17
	:	:			
Herbicides	:	:			
2,4-D, 4#/Gal EC	: Gal	: 14.20	14.80	14.90	14.90
Acetochlor(Harness, Surpass) 6.4-7#/Gal EC	: Gal	:	2/	69.20	66.40
Alachlor (Lasso), 4#/Gal EC	: Gal	: 28.10	28.70	25.30	25.70
Atrazine (AAtrex), 4#/Gal L	: Gal	: 14.40	14.50	13.80	13.70
Bentazon (Basagran), 4#/Gal EC	: Gal	: 73.10	74.80	76.30	78.60
Butylate (Sutan), 6.7#/Gal EC	: Gal	: 18.00	20.80	19.60	21.10
	:	:			
Chlorimuron-ethyl (Classic), 25% DF	: Oz	: 18.50	18.60	19.00	12.90
Chlorsulfuron (Glean), 75% DF	: Oz	: 17.80	19.10	17.70	18.20
Cyanazine (Bladex), 4#/Gal EC	: Gal	: 28.30	29.40	30.00	31.60
DCPA (Dacthal), 75% WP	: Lb	: 7.40	7.93	8.31	12.10
Dicamba (Banvel), 4#/Gal EC	: Gal	: 87.50	90.20	93.40	94.10
	:	:			
Diuron (Karmex, Diurex), 80% WP	: Lb	: 5.14	5.20	5.25	5.26
EPTC (Eptam, Eradicane), 6.7-7#/Gal EC	: Gal	: 26.60	29.00	30.50	32.30
Glyphosate (Roundup), 4#/Gal EC	: Gal	: 54.10	55.70	56.70	56.30
Imazaquin (Scepter), 1.5#/Gal EC	: Gal	:214	210	225	3/

Linuron (Lorox, Linex), 50% DF	Lb	10.90	11.70	12.00	11.90
MCPA, 4#/Gal EC	Gal	15.90	16.80	16.80	16.90
Metolachlor (Dual), 8#/Gal EC	Gal	67.70	69.40	69.50	72.60
Metribuzin (Lexone or Sencor), 75% DF	Lb	27.50	27.70	27.70	22.00
MSMA (Super Arsonade), 4-6# Gal EC	Gal	23.80	23.60	24.70	24.30

See footnotes at end of table. -- continued

Prices Paid: Agricultural Chemicals, United States, April 1995-98 (Continued)

Item 1/	Unit	1995	1996	1997	1998
		Dollars			
Herbicides (Continued)					
Napropamide (Devrinol), 50% WP	Lb	8.17	8.66	8.93	9.21
Paraquat (Gramoxone Extra), 2.5#/Gal EC	Gal	35.00	36.20	37.80	39.00
Pendimethalin (Prowl), 3.3#/Gal EC	Gal	28.90	29.20	29.40	29.60
Sethoxydim (Poast), 1.5#/Gal EC	Gal	112	112	101	89.60
Simazine (Princep), 4#/Gal EC	Gal	18.20	18.40	18.20	18.50
Terbacil (Sinbar), 80% WP	Lb	26.00	26.70	26.40	27.40
Trifluralin (Treflan), 4#/Gal EC	Gal	32.80	32.60	31.40	29.90
Insecticides					
Acephate (Orthene), 75% SP	Lb	11.60	12.00	12.80	12.50
Aldicarb (Temik), 15% G	Lb	3.65	3.62	3.70	3.70
Azinphos-Methyl (Guthion), 50% WP	Lb	8.57	8.66	8.62	8.97
Bt (Dipel 2X), WP	Lb	13.20	12.50	12.30	12.10

Carbaryl (Sevin), 80% WP		4.59	4.64	4.76	4.96
Carbofuran (Furadan), 15% G	Lb	1.91	1.99	1.99	2.24
Chlorpyrifos (Lorsban), 4#/Gal EC	Gal	49.30	51.10	50.70	51.00
Cyfluthrin (Baythroid) 2#/Gal EC	Gal	450	489	479	486
Cypermethrin (Ammo, Cymbush), 2.5-3#/Gal EC	Gal	260	256	252	264
Diazinon, 4#/Gal EC	Gal	35.00	36.50	36.10	34.90
Dicofol (Kelthane), 35% WP	Lb	9.34	9.98	10.20	10.60
Dicrotophos (Bidrin), 8#/Gal EC	Gal	87.00	87.30	88.60	86.80
Dimethoate (Cygon), 2.67#/Gal EC	Gal	27.00	31.20	32.90	34.70
Disulfoton (Di-Syston), 8#/Gal EC	Gal	72.80	75.40	76.30	79.50
Endosulfan (Thiodan, Phaser),3#/Gal EC	Gal	39.70	40.30	39.10	39.40
Esfenvalerate (Asana XL),.66#/Gal EC	Gal				
Ethion 4#/Gal EC	Gal	36.80	35.70	38.60	41.60
Fonofos (Dyfonate II), 20% G	Lb	1.99	1.95	2.04	2.03
Imidacloprid (Admire, Provado), 1.6-2#/Gal EC	Gal		2/	537	552
Malathion, 5#/Gal EC	Gal	22.60	23.20	24.10	25.00
Methidathion (Supracide), 2#/Gal EC	Gal	48.70	52.20	50.60	55.70
Methomyl (Lannate L), 1.81 #/Gal	Gal	44.10	47.00	48.00	46.70
Methyl Parathion, 4#/Gal EC	Gal	27.30	27.50	27.30	29.40
Oil	Gal	5.09	4.99	5.13	5.32
Oxamyl (Vydate-L), 2#/Gal L	Gal	62.40	61.90	61.80	63.50
Oxydemeton-Methyl (Metasystox-R), 2#/Gal EC	Gal	60.70	64.10	63.10	66.70
Oxthioquinox (Morestan), 25% WP	Lb				
Phorate (Thimet), 20% G	Lb	1.98	2.03	2.14	2.24
Phosmet (Imidan, Prolate), 50% WP	Lb	4.91	5.44	5.79	6.22

Propargite (Comite, Omite), 30% WP	Lb	5.89	6.21	6.49	6.41
Synthetic Pyrethroids,					
(Pounce, Ambush), 2-3.2 #/Gal EC	Gal	154	156	159	162
Terbufos (Counter), 15% G	Lb	1.91	2.20	2.31	2.56
Zeta-Cypermethrin (Fury), 1.5 #/Gal EC	Gal		2/	280	290
Other					
Gibberellic Acid (RyzUp,Pro-Gibb)4.0%	Gal	227	208	202	189
Nad Napthalene Acetamide					
(Amid-Thin W), 8.4% WP	Lb	56.20	55.80	61.50	62.80

1/ Formulation abbreviations: EC - Emulsifiable Concentrate, DF - Dry Flowable, DG - Dry Granular, G - Granular, L - Liquid, S - Solution, SP - Soluble Powder, and WP - Wettable Powder.
2/ Added in 1997.
3/ Discontinued in 1998.

Field Seeds: Prices Paid, United States, April, 1995-1998

Item	Unit	1995	1996	1997	1998
		Dollars			
GRASSES					
Bluegrass, Kentucky					
Proprietary, Including Merion	Lb	2.28	2.43	2.24	2.16
Public and Common	Lb	1.59	1.72	1.53	1.52
Fescue, Tall	Cwt	88.10	109	148	101
Orchardgrass	Cwt	148	141	119	116
Rye Grass, Annual	Cwt	67.60	58.80	57.90	65.30
Sudangrass	Cwt	51.80	51.90	51.40	53.70
Timothy	Cwt	71.00	76.00	73.00	71.20
LEGUMES					

Alfalfa						
Proprietary	Cwt	274	277	282	288	
Public and Common	Cwt	168	185	185	205	
Clover						
Ladino	Lb	3.20	3.18	3.07	3.08	
Red	Cwt	134	172	184	194	
Lespedeza						
Korean	Cwt	66.00	99.00	90.00	89.00	
Striate, Kobe	Cwt	95.60	125	112	108	
Sericea	Cwt	178	291	220	290	
ROW CROPS						
Corn, Hybrid	1/	77.10	77.70	83.50	86.90	
Cottonseed	Cwt	68.20	73.00	74.90	79.30	
Flax	Bu	8.00	8.14	9.31	10.00	
Grain Sorghum, Hybrid	Cwt	78.70	84.00	92.00	96.00	
Peanuts	Cwt	79.50	82.00	81.75	83.60	
Potatoes	Cwt	7.90	10.30	7.60	9.10	
Soybeans	Bu	13.40	14.80	16.10	17.15	
Sunflower	Cwt	297	313	355	380	
SMALL GRAINS						
Barley, Spring	Bu	5.37	6.49	6.13	6.04	
Oats, Spring	Bu	4.51	5.19	5.32	5.02	
Rice	Cwt	15.10	17.50	19.00	19.50	
Wheat, Spring	Bu	7.12	8.10	7.30	6.85	
Wheat, Winter	Bu	7.80	8.50	10.00	8.25	

1/ 80,000 kernels.

United States, April 1993-98

Item and Unit	1993	1994	1995	1996	1997	1998
			Dollars			
Baler, Square, Pick-Up, Square, Automatic Tie, Conventional Size Bales						
Under 200 Lbs	12,200	12,700	13,300	13,800	14,600	15,200
Round, 1200-1500 Lb bale	15,300	15,900	16,600	17,100	16,900	17,300
Round, 1900-2200 Lb bale				1/	21,600	22,300
Chisel Plow, Maxiumum 1 Foot Depth of Tillage, Chisel or Sweep Type, Drawn or Mounted,						
16-20 Foot	9,160	10,300	9,520	10,300	11,300	11,700
Combine, Self Propelled with Grain Head,						
Extra-Large capacity				1/	155,000	162,000
Large capacity		1/	130,000	137,000	135,000	140,000
Corn Head for combine, 6-Row		1/	20,100	20,800	21,700	22,400
Corn Head for combine, 8-Row				1/	28,500	29,000
Cotton Picker, Self Propelled, with spindle, 4-Row		1/	183,000	192,000	195,000	198,000
Cultivator, Row Crop, Front or Rear Mounted,						
6-Row	4,600	4,740	4,880	5,410	5,680	5,900
12-Row, Flexible	9,570	10,200	11,200	11,900	12,500	13,500
Disk Harrow, Tandem, Drawn 2/						
15-17 Foot	9,460	10,300	10,400	10,900	12,100	12,200
18-20 Foot	13,200	13,900	14,600	15,700	16,100	16,600

Elevator, Portable, Without Power Unit, Auger Type, 8 Inch Diameter, 60 Foot		1/	3,590	3,760	3,660	3,660
Feed Grinder-Mixer, Trailer Mounted, P.T.O. Operated		10,600	11,300	11,700	11,800	12,200 12,900
Field Cultivator, Mounted or Drawn,						
17-19 Foot		6,580	6,980	7,580	8,280	9,060 9,670
20-25 Foot, Flexible		9,800	10,900	11,400	12,100	12,500 13,500
Forage Harvester, P.T.O., Shear Bar Type, Class II or III, 99 2.24						
Chlorpyrifos (Lorsban), 4#/Gal EC	Gal	49.30	51.10	50.70	51.00	
Cyfluthrin (Baythroid) 2#/Gal EC	Gal	450	489	479	486	
Cypermethrin (Ammo, Cymbush), 2.5-3#/Gal EC	Gal	260	256	252	264	
Diazinon, 4#/Gal EC	Gal	35.00	36.50	36.10	34.90	
Dicofol (Kelthane), 35% WP	Lb	9.34	9.98	10.20	10.60	
Dicrotophos (Bidrin), 8#/Gal EC	Gal	87.00	87.30	88.60	86.80	
Dimethoate (Cygon), 2.67#/Gal EC	Gal	27.00	31.20	32.90	34.70	
Disulfoton (Di-Syston), 8#/Gal EC	Gal	72.80	75.40	76.30	79.50	
Endosulfan (Thiodan, Phaser),3#/Gal EC	Gal	39.70	40.30	39.10	39.40	
Esfenvalerate (Asana XL),.66#/Gal EC	Gal					
Ethion 4#/Gal EC	Gal	36.80	35.70	38.60	41.60	
Fonofos (Dyfonate II), 20% G	Lb	1.99	1.95	2.04	2.03	
Imidacloprid (Admire, Provado), 1.6-2#/Gal EC	Gal		2/	537	552	
Malathion, 5#/Gal EC	Gal	22.60	23.20	24.10	25.00	
Methidathion (Supracide), 2#/Gal EC	Gal	48.70	52.20	50.60	55.70	
Methomyl (Lannate L), 1.81 #/Gal	Gal	44.10	47.00	48.00	46.70	

Methyl Parathion, 4#/Gal EC	Gal	27.30	27.50	27.30	29.40
Oil	Gal	5.09	4.99	5.13	5.32
Oxamyl (Vydate-L), 2#/Gal L	Gal	62.40	61.90	61.80	63.50
Oxydemeton-Methyl (Metasystox-R), 2#/Gal EC	Gal	60.70	64.10	63.10	66.70
Oxthioquinox (Morestan), 25% WP	Lb				
Phorate (Thimet), 20% G	Lb	1.98	2.03	2.14	2.24
Phosmet (Imidan, Prolate), 50% WP	Lb	4.91	5.44	5.79	6.22
Propargite (Comite, Omite), 30% WP	Lb	5.89	6.21	6.49	6.41
Synthetic Pyrethroids,					
(Pounce, Ambush), 2-3.2 #/Gal EC	Gal	154	156	159	162
Terbufos (Counter), 15% G	Lb	1.91	2.20	2.31	2.56
Zeta-Cypermethrin (Fury), 1.5 #/Gal EC	Gal		2/	280	290
Other					
Gibberellic Acid (RyzUp,Pro-Gibb)4.0%	Gal	227	208	202	189
Nad Napthalene Acetamide (Amid-Thin W), 8.4% WP	Lb	56.20	55.80	61.50	62.80

1/ Formulation abbreviations: EC - Emulsifiable Concentrate, DF - Dry Flowable, DG - Dry Granular, G - Granular, L - Liquid, S - Solution, SP - Soluble Powder, and WP - Wettable Powder.
2/ Added in 1997.
3/ Discontinued in 1998.

Field Seeds: Prices Paid, United States, April, 1995-1998

Item	Unit	1995	1996	1997	1998
			Dollars		
GRASSES					
Bluegrass, Kentucky					

Proprietary, Including Merion	Lb	2.28	2.43	2.24	2.16	
Public and Common	Lb	1.59	1.72	1.53	1.52	
Fescue, Tall	Cwt	88.10	109	148	101	
Orchardgrass	Cwt	148	141	119	116	
Rye Grass, Annual	Cwt	67.60	58.80	57.90	65.30	
Sudangrass	Cwt	51.80	51.90	51.40	53.70	
Timothy	Cwt	71.00	76.00	73.00	71.20	
LEGUMES						
Alfalfa						
Proprietary	Cwt	274	277	282	288	
Public and Common	Cwt	168	185	185	205	
Clover						
Ladino	Lb	3.20	3.18	3.07	3.08	
Red	Cwt	134	172	184	194	
Lespedeza						
Korean	Cwt	66.00	99.00	90.00	89.00	
Striate, Kobe	Cwt	95.60	125	112	108	
Sericea	Cwt	178	291	220	290	
ROW CROPS						
Corn, Hybrid	1/	77.10	77.70	83.50	86.90	
Cottonseed	Cwt	68.20	73.00	74.90	79.30	
Flax	Bu	8.00	8.14	9.31	10.00	
Grain Sorghum, Hybrid	Cwt	78.70	84.00	92.00	96.00	
Peanuts	Cwt	79.50	82.00	81.75	83.60	
Potatoes	Cwt	7.90	10.30	7.60	9.10	
Soybeans	Bu	13.40	14.80	16.10	17.15	
Sunflower	Cwt	297	313	355	380	
SMALL GRAINS						
Barley, Spring	Bu	5.37	6.49	6.13	6.04	
Oats, Spring	Bu	4.51	5.19	5.32	5.02	

Rice	Cwt	15.10	17.50	19.00	19.50	
Wheat, Spring	Bu	7.12	8.10	7.30	6.85	
Wheat, Winter	Bu	7.80	8.50	10.00	8.25	

1/ 80,000 kernels.

Prices Paid: Farm Machinery and Tractors,
United States, April 1993-98

Item and Unit	1993	1994	1995	1996	1997	1998
			Dollars			
Baler, Square, Pick-Up, Square, Automatic Tie, Conventional Size Bales						
Under 200 Lbs	12,200	12,700	13,300	13,800	14,600	15,200
Round, 1200-1500 Lb bale	15,300	15,900	16,600	17,100	16,900	17,300
Round, 1900-2200 Lb bale				1/	21,600	22,300
Chisel Plow, Maxiumum 1 Foot Depth of Tillage, Chisel or Sweep Type, Drawn or Mounted,						
16-20 Foot	9,160	10,300	9,520	10,300	11,300	11,700
Combine, Self Propelled with Grain Head,						
Extra-Large capacity				1/	155,000	162,000
Large capacity		1/	130,000	137,000	135,000	140,000
Corn Head for combine, 6-Row		1/	20,100	20,800	21,700	22,400
Corn Head for combine, 8-Row				1/	28,500	29,000
Cotton Picker, Self Propelled,						

with spindle, 4-Row	1/	183,000	192,000	195,000	198,000	
Cultivator, Row Crop, Front or Rear Mounted,						
6-Row	4,600	4,740	4,880	5,410	5,680	5,900
12-Row, Flexible	9,570	10,200	11,200	11,900	12,500	13,500
Disk Harrow, Tandem, Drawn 2/						
15-17 Foot	9,460	10,300	10,400	10,900	12,100	12,200
18-20 Foot	13,200	13,900	14,600	15,700	16,100	16,600
Elevator, Portable, Without Power Unit, Auger Type,						
8 Inch Diameter, 60 Foot	1/	3,590	3,760	3,660	3,660	
Feed Grinder-Mixer, Trailer Mounted, P.T.O. Operated	10,600	11,300	11,700	11,800	12,200	12,900
Field Cultivator, Mounted or Drawn,						
17-19 Foot	6,580	6,980	7,580	8,280	9,060	9,670
20-25 Foot, Flexible	9,800	10,900	11,400	12,100	12,500	13,500
Forage Harvester, P.T.O., Shear Bar Type, Class II or III,						
With Pick-Up Attachment	21,100	23,000	22,000	22,600	23,500	24,200
With Row Crop Unit, 2-Row	1/	24,700	25,100	26,000	26,200	
Forage Harvester, Self Propelled:						
Shear Bar, 4-6 Row Crop			1/	177,000	191,000	

See footnotes at end of table. -- continued

Prices Paid: Farm Machinery and Tractors,
United States, April 1993-98 (Continued)

Item and Unit	1993	1994	1995	1996	1997	1998
			Dollars			
Front-End Loader, Hydraulic, Tractor Mounted 1800-2500 Lb. Capacity, 60 Inch Bucket	1/	4,680	4,660	4,860	4,910	
Grain Drill, Most Common Spacing:						
Plain, 15-17 Openers	7,300	7,750	8,830	8,640	10,200	10,600
Press, 23-25 Openers	11,300	11,300	11,500	13,300	14,400	16,300
With Fertilizer Attachment, 20-24 Openers	9,350	9,480	9,920	10,500	11,700	12,700
Min/No-Till W/Fert. Attach., 15 Foot	19,300	23,900	23,300	24,600	25,300	26,200
Hayrake, Side-Delivery, or Wheel Rake, Traction Drive, 8-12 Foot Working Width	3,670	3,780	3,980	4,040	4,240	4,410
Hay Tedder, 15-18 Foot	3,630	3,830	3,890	4,000	4,120	4,130
Manure Spreader, Conveyor Type, P.T.O. 2-wheel, with Tires						
141-190 Bushel Capacity	1/	5,590	5,830	6,250	6,330	
225-300 Bushel Capacity	1/	7,600	8,090	8,440	8,610	
Mower-Conditioner, Pull Type, PTO, Sickle(Cutter)Bar or Disc:						
8-10 Foot	10,700	11,600	11,800	12,000	12,200	12,600
14-16 Foot				1/	18,900	19,700
Mower, Mounted or Drawn,						
7-8 Foot Sickle (Cutter) Bar	3,500	3,640	3,990	3,940	4,130	4,220
13-14 Foot Sickle (Cutter) Bar:				1/	11,600	13,000
Planter, Row Crop, with Fertilizer Attachment,						

4-Row	11,900	12,300	12,400	13,700	13,300
14,200					
8-Row	21,000	22,500	22,700	24,400	25,800
25,700					
24-Row				1/	89,000
87,200					
12-Row, Conservation (for No-Till Conditions)	34,600	37,800	38,600	41,100	43,900
44,300					
Rotary Hoe, 20-25 Foot	5,320	5,140	5,230	5,260	5,700
5,940					
Rotary Cutter, 7-8 Foot	2,800	2,680	2,760	2,670	2,860
2,810					
Sprayer, Field Crop, Power, Boom Type, (Exclude Self-Propelled and Orchard)					
Tractor Mounted, with 300 Gallon Spray Tank	3,300	3,490	3,820	3,880	4,290
4,350					
Trailer Type, with 500-700 Gallon Spray Tank	6,000	6,760	7,860	8,560	9,650
9,950					

See footnotes at end of table. -- continued

Prices Paid: Farm Machinery and Tractors, United States, April 1993-98 (Continued)

Item and Unit	1993	1994	1995	1996	1997	1998
	Dollars					
Tractor, 2 Wheel Drive,						
30-39 P.T.O. horsepower	14,200	14,100	14,400	15,000	15,400	15,300
50-59 P.T.O. horsepower	19,200	19,700	20,100	20,600	21,200	21,800
70-89 P.T.O. horsepower	28,500	29,200	30,700	30,900	31,800	32,800
110 - 129 P.T.O. horsepower	51,600	53,600	54,000	55,400	57,400	59,500
140 - 159 P.T.O. horsepower	63,600	68,500	70,000	71,500	74,800	77,100

190 - 220 P.T.O. horsepower	:			1/	102,000	105,000
Tractor, 4-Wheel Drive,	:					
200 - 280 P.T.O. horsepower	:94,100	96,100	98,700	100,000	111,000	116,000
Wagon, Gravity Unload, W/Box and Running Gear, and Tires, Without Side Extensions,	:					
200-400 Bushel Capacity	:	1/	3,640	3,520	3,720	3,870
Wagon, Running Gear, W/O Box,	:					
8-10 Ton Capacity	:	1/	1,610	1,620	1,690	1,680
Windrower, Self-Propelled,	:					
14-16 Foot	:36,400	44,600	45,800	46,900	52,100	54,500

1/ Not surveyed.
2/ With hydraulic lift, transport wheels, and tires.

****
*
* The data presented in the folling tables are calculated and published *
* for use by the Forest Service, USDA and the Bureau of Land Management, *
* USDI in computing Public Land Grazing Fees.
*
****

1998 Prices Paid Index for Beef Cattle Production (1964-68=100) 1/: 514

1/ The Index of Prices Paid by Farmers and Ranchers for Beef Cattle Production input items is for the period of November 1997 through October 1998. The components of this index include the production indexes of Fuels & Energy, Farm & Motor Supplies, Building & Fencing Materials, Interest, Farm Wage Rates, and Farm Services. These components are weighted to the overall index value by their importance in the cost of producing beef cattle, the weights are unchanged from a year earlier.

Cattle: Prices Received, Selected States, 1998 1/

State	Beef Cattle
	Dollars Per Cwt
9 Great Plains States 2/	62.75
11 Western States 3/	60.01
16 Western States 4/	62.15
17 Western States 5/	62.12

1/ Average for November 1997 through October 1998, except NV, UT, and WA which are marketing year averages.
2/ CO, KS, NE, NM, ND, OK, SD, TX, and WY.
3/ AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, AND WY.
4/ Eleven Western States plus KS, NE, ND, OK, and SD.
5/ Sixteen Western States plus TX.

Other Hay, Baled: Prices Received, Selected States, Marketing Year Average, 1996-1998 1/

Region	3-Year Avg
	Dollars Per Ton
Appalachia 2/	64.30
Corn Belt 3/	69.50
Florida	90.70
Lake States 4/	65.90
Northeast 5/	98.20
Southeast/Delta 6/	55.50

1/ Prices provided to the Forest Service, USDA to compute Eastern National Forest grazing fees.
2/ KY, NC, TN, VA, and WV.
3/ IL, IN, MO, and OH.
4/ MI, MN, and WI.
5/ ME, NH, NY, PA and VT.
6/ AL, AR, GA, LA, MS, and SC.

Grazing Fee Rates for Cattle by Selected States and Regions

	Survey Average Rates 1/

State	Animal Unit 2/		Cow-Calf		Per Head	
	1997	1998	1997	1998	1997	1998
	Dollars Per Month					
AZ	6.50	6.70	8.50	9.50	7.90	8.30
CA	10.60	11.50	13.00	14.50	12.00	12.90
CO	11.30	11.80	13.60	13.90	10.60	11.50
ID	10.40	10.80	12.50	12.80	11.20	11.50
KS	10.50	12.90	12.80	14.80	9.80	11.90
MT	12.30	12.60	13.90	14.30	13.20	13.30
NE	18.80	19.00	22.20	23.00	18.50	19.00
NV	9.00	9.10	12.00	12.00	9.50	9.70
NM	8.79	8.80	10.30	9.75	9.00	9.70
ND	9.30	10.20	11.00	11.40	10.00	11.10
OK	8.00	9.00	8.70	9.50	7.50	8.00
OR	10.20	11.10	11.50	12.80	9.85	11.40
SD	14.00	14.20	16.40	16.50	14.40	14.80
TX	9.00	9.00	10.00	9.50	8.00	9.00
UT	9.00	10.00	11.10	11.30	11.00	11.10
WA	9.00	10.00	9.60	10.50	9.30	10.50
WY	12.00	11.90	14.00	13.80	12.20	12.30
17-State 3/	11.00	11.40	12.70	13.00	10.80	11.60
16-State 4/	11.70	12.30	13.70	14.30	11.80	12.50
11-State 5/	10.70	11.10	12.60	13.00	11.30	11.80
9-State 6/	11.00	11.50	12.80	13.00	10.60	11.40

1/ The average rates are estimates (rates over $10.00 are rounded to the nearest dime) based on survey indications of monthly lease rates for private, non-irrigated grazing land from the January Agricultural Survey.
2/ Includes animal unit plus cow-calf rates. Cow-calf rate converted to animal unit (AUM) using (1 aum=cow-calf *0.833).
3/ Seventeen State: All States.
4/ Sixteen State: All States except Texas.
5/ Eleven State: AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY.
6/ Nine State: CO, KS, NE, NM, ND, OK, SD, TX, WY.

Report Features

Listed below are the commodity specialists in the Estimates Division of the National Agricultural Statistics Service to contact for additional information.

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The next "Agricultural Price Summary" report will be released in July 2000.

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Version 3.00

Updated September 1998
Supersedes Ver 2.50

PRUDENT FOOD STORAGE: Questions & Answers

From the House at Cat's Green
Alan T. Hagan

"In this work, when it shall be found that much is omitted,
let it not be forgotten that much likewise is performed."

Samuel Johnson, 1775, upon
completion of his dictionary.
Courtesy of James T. Stevens

********* SPECIAL NOTE ***** SPECIAL NOTE ***** SPECIAL NOTE ********

This Version 3.0 update of the Prudent Food Storage FAQ includes a first time event. An increasing number of people have been asking for a printed and bound copy of the FAQ, apparently as a response to the Year 2000 computer problem and other Millennial concerns. With the aid of my partner, Bob Hollingsworth, we have formatted, printed and bound Version 3.0 to honor these requests. Naturally, since we have spent a good deal of our time and a not inconsiderable amount of our cash in doing this we are not giving it away for free, but are charging $15.00 (US) per copy plus $3.00 shipping and handling (US Postal Service Priority Mail). My postal address may be found below and at the end of this file, or you may e-mail me.

This print edition will be available for only for a limited time. The reason for this is that I am presently at work on "The Prudent Pantry: Your Guide to Building A Food Insurance Program", my first commercial work. When completed it will contain all of the content of this FAQ plus a good deal more that I don't presently cover such as storage program planning, inventory control, storage locations, the best foods to store, grain mills & other equipment, water storage and purification along with expedient sanitation.

At this time I am not ready to give either a firm publication date or cover price for *The Prudent Pantry*, but I am hoping for early spring of 1999. When it is ready to go to press I will stop printing bound FAQ copies. Due to the ever growing size of the work (presently over 300k) I can no longer post the FAQ to the Usenet. I will, of course, continue to make the FAQ updates available online via host sites on the World Wide Web even after the book hits the street.

CARPE DIEM!

********* SPECIAL NOTE ***** SPECIAL NOTE ***** SPECIAL NOTE **********

ACKNOWLEDGEMENTS: Diana Hagan, my wife, and soon to be co-author, for copious amounts of genial tolerance and endless editing; Susan Collingwood for sage advice; BarbaraKE; Gary Chandler; Skipper Clark, author of *Creating the Complete Food Storage Program*; Denis DeFigueiredo; Al Durtschi for resources and encouragement; Craig Ellis; Pyotr Filipivich; Sandon A. Flowers; Amy Gale, editor of the *rec.food.cooking FAQ*; Geri Guidetti, of the *Ark Institute*; Woody Harper; Higgins10; Robert Hollingsworth, for the formatting and publishing of the hard copy edition; Jenny S. Johanssen; Kahless; James T. Stevens, author of *Making The Best of Basics*; Amy Thompson (Saco Foods); Patton Turner; Logan VanLeigh; Mark Westphal; a number of folks who for reasons sufficient unto themselves wish to remain anonymous; and last, but certainly not least, Leslie Basel, editor of the *rec.food.preserving FAQ*, without whom I'd never have attempted this in the first place.

Updated: 9/18/96; 4/16/97; 7/21/97; 10/20/97; 9/15/98

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FOREWORD

This work is a compilation of answers to frequently asked questions (FAQ) concerning long term food storage. Its purpose is to promote an understanding of the methods and techniques used to extend the nutritive and palatability shelf lives of those foods most suitable for use in food storage programs.

There is commonality between food storage and food preservation even though they are not precisely the same thing. Some of the information here may be found in greater or lesser detail in the *rec.food.preserving* (r.f.p) FAQ compiled by Leslie Basel. If you want the how-to's of drying fruit, making jerky, canning beans, fermenting pickles or corning beef, I refer you to her work and the good stuff to be found there.

In this compendium you will be taken through the ins and outs of how to put away your storage foods and have a reasonable expectation of getting something edible back out of the container when you finally use them. Also covered will be food spoilage -- how to recognize it and how to combat it. A resource list detailing where to find supplies and further information is included at the end.

This file is updated as sufficient material becomes available. Be of assistance -- point out mistakes, contribute data or information, write reviews, or provide us with new sources. As a contributor you will be cited in this file, unless you wish otherwise.

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-- I --

SHELF LIVES: TIME, TEMPERATURE, MOISTURE, OXYGEN AND LIGHT

==========

Is your food insurance up to date?

Since the entire idea of a food storage program is that it should be available for "you and yours" in times of need, it is important to understand the conditions that can affect the edibles stored in your pantry.

A storage program is only as good as the quality of the food that goes into it. It cannot get any better than what originally went in, but it can certainly get worse. In the fullness of time, all stored foods will degrade in nutrient content and palatability until they reach the inevitable end where even the dog won't eat them. It's because of this eventuality that every article, book, and teacher concerned with putting food by gives the same advice: *Date all food containers and

rotate, Rotate, ROTATE. The first food in should be the first food out.* This concept is often shortened to the acronym FIFO.

The reason for this emphasis on stock rotation is that when discussing the usefulness of foodstuffs there are really two shelf lives to be considered. The first is the nutrient content of the food. This actually begins to fade at the moment of harvest. Three factors dictate nutritional shelf life: The food's initial nutritional content; the processing and preservation steps it underwent; and its storage conditions. Eventually the nutrition will dwindle away to nothing. At some point you will have to decide whether the remaining nutrition is worth the space the food is taking up and if it should be rotated out of storage.

The second shelf life is a food's palatability life or the point at which undesirable changes occur to its taste, texture, color and cooking qualities. This is the reason for the "use by" and "sell by" dates on many foods and for shelve lives in general. It will almost always be in excess of good nutritive life. If you don't have anything to replace it with, it's not necessary to throw food out just because it's reached the end of its best palatable storage life. Do, however, keep in mind that advancing age will only further decrease the useful nutrition, increase the foods' unattractiveness and enlarge the chances that something may cause the food to spoil.

Within reason, the key to prolonging the shelf life of your edibles lies in lowering the temperature of the area they are stored in. The storage lives of most foods are cut in half by every increase of 18 deg. F (10 deg. Celsius). For example, if you've stored your food in a garage that has a temperature of 90 deg. F, you should expect a shelf life less than half of what could be obtained at room temperature (70 deg. F) this in turn is less than half the storage life that you could get if you kept them in your refrigerator at 40 deg. F. Your storage area should be located where the temperature can be kept above freezing (32 deg. F) and, if possible, below 72 deg. F.

Ideally, your storage location should have a humidity level of 15% or less, but unless you live in the desert it's not terribly likely you'll be able to achieve this. Regardless, moisture is not good for your stored edibles so you want to minimize it as much as possible. This can be done by several methods. The first is to keep the area air-conditioned and/or dehumidified during the humid times of the year. The second is to use packaging impervious to moisture and then to deal with the moisture trapped inside. If you are able, there's no reason not to use both.

All containers should be kept off the floor and out of direct contact from exterior walls to reduce the chances of condensation.

Another major threat to your food is oxygen. Chances are that if you have it sealed in moisture-proof containers then they are probably air-tight as well. This means that the oxygen can also be kept from doing its damage. If no more can get in, your only concern is the O2 that was trapped in the container when it was sealed. Lowering the

percentage of O2 to 2% or less of the atmosphere trapped in the packaging (called head gas) can greatly contribute to extending its contents shelf life. The three main tactics for achieving this are vacuum sealing, flushing with inert gas or chemically absorbing the oxygen. Any one or a combination of the three can be used to good effect.

Once you have temperature, humidity and oxygen under control, it is then necessary to look at light. Light is a form of energy and when it shines on your stored foods long enough it transfers some of that energy to the food. This has the effect of degrading its nutritional content and appearance. Fat soluble vitamins, such as A, D and E are particularly sensitive to light degradation. It certainly is a pretty sight to look at rows and rows of jars full of delicious food, particularly if you were the one that put the food in those jars. However, if you want to keep them at their best, you'll admire them only when you turn the light on in the pantry to retrieve one. If you don't have a room that can be dedicated to this purpose then store the jars in the cardboard box they came in. This will protect them not only from light, but help to cushion them from shocks which might break a jar or cause it to lose its seal. For those of you in earthquake country, it's a particularly good idea. When "terra" is no longer "firma" your jars just might dance right off onto the floor.

Assuming they were properly processed in the first place, canned, dried and frozen (never thawed) foods do not become unsafe when stored longer than the recommended time, but their nutrient quality fades and their flavor goes downhill. Following these rules of good storage will keep your food wholesome and nutritious for as long as possible:

#1 - First In, First Out (FIFO) means rotating your storage
#2 - Cooler is better
#3 - Drier is better
#4 - Less oxygen exposure means more shelf life.
#5 - Don't shed light on your food.

Think of rotating your food storage as paying your food insurance premiums -- slacking off on rotation cuts back on your coverage. Is your food insurance up to date?

==========

-- II --
THE TECHNIQUES OF FOOD STORAGE

==========

In this section will be covered a number of foods that are particularly suited to being included in storage programs along with the various forms they can be found in and specific tips for a number of different food categories.

A. GRAINS AND LEGUMES

A.1 GRAIN VARIETIES

One of the most important decisions in planning a food storage program is what kinds of grains to include, but many people do not give this adequate thought. Some just buy however much wheat or corn or rice they think is necessary to meet their needs and leave it at that. Others rely on pre-packaged decisions made for them by their storage food retailer who put together a "year's supply of food" to buy all at once. Either decision could be a major mistake.

There are a number of food storage plans one may use as a guide. Many are based on the so-called "Mormon Four" of wheat, milk, honey and salt, with as many additional foods as the planner found to be desirable. When it was created in 1937, this plan may have been OK, but we've learned a great deal since then. An unfortunate number of people in our society develop allergies to one kind of food or another. One of the more common food allergens is wheat. Even more unfortunate is the fact that many people who have an allergy to wheat don't even know it. They won't become aware of it until they try to live with wheat as a large part of their diet. For this reason you should store what you eat and eat what you store, so that ugly surprises such as this don't come up when it's too late to easily avoid them.

A second reason to think about storing a selection of different grains is appetite fatigue. There are those who think providing variety in the diet is relatively unimportant and that if and when the time comes they'll eat what they've got and that will be that. For healthy, well-adjusted adults under ordinary circumstances this might be possible without too much difficulty. However, the entire reason for having a food storage program is for when circumstances aren't ordinary. Times of crisis produce stress -- possibly physical, but always mental. If you are suddenly forced to eat a diet both alien and monotonous, it is going to add just that much more stress on top of what you are already dealing with. If your planning includes the elderly, young children and/or infants they might just quit eating or refuse to eat sufficient amounts and become unable to survive. This is not a trivial problem and should be given serious consideration. Consider the positive aspects of adding some comfort foods.

In his book, *Making the Best of Basics*, James Stevens mentions a post-WWII study by Dr. Norman Wright, of the British Food Ministry, which found that people in England and Europe were more likely to reject unfamiliar or distasteful foods during times of stress than under normal conditions. When it's wheat, day in and day out, wheat's going to start becoming distasteful fast. Far better to have a variety of foods on hand to forestall appetite fatigue and, more importantly, to use those storable foods in your everyday diet so that you'll be accustomed to them.

[If anyone knows where I may find an actual copy of the study by Dr. Wright, I'd appreciate it if you'd point me to it. Thanks- ed.]

ABOUT GLUTEN: As you read through the grains descriptions below you will come across frequent mention of "gluten". Gluten is the protein in grains that enables the dough made from them to trap the

gasses produced by yeast fermentation or chemical reaction of baking powder or soda and in turn causes it to rise. The amount of this protein to be found in species of grains and varieties within a species can vary radically. Some grains such as rice have virtually no gluten at all and will not produce a raised loaf by itself while others like hard winter wheat have a great deal and makes excellent raised bread. Whether gluten content is of importance to you will depend upon the end uses you intend for your grain.

Some of the common and relatively uncommon types of grains and their varieties are listed below.

AMARANTH: Amaranth is not a true cereal grain at all, but is a relative of the pigweeds and the ornamental flowers we call "cockscomb". It's grown not only for its seed, but for its leaves that can be cooked and eaten as greens. The seed is high in protein, particularly the amino acid lysine which is limited in the true cereal grains. It can be milled as-is, or toasted to provide more flavor. The flour lacks gluten, so it's not suited for raised breads, but can be made into any of a number of flat breads. Some varieties can be popped much like popcorn, or can be boiled and eaten as a cereal, used in soups, granolas, and the like. Toasted or untoasted, it blends well with other grain flours.

BARLEY: Barley is thought by some to be the first grain ever grown by man. It has short, stubby kernels with a hull that is difficult to remove. Excluding barley intended for malting or animal feed, most of this grain is consumed by humans in two forms. Most common is the white, highly processed "pearl barley" with much of its bran and germ milled off along with its hull. It is the least nutritious form of barley. The second offering is called "pot" or "hulled barley" and it has been subjected to the same milling process as pearled, but with fewer trips through the polisher. Because of this, it retains more of the nutritious germ and bran. Unless you are prepared to try to get the hulls off I don't recommend buying unhulled barley. Although it can be milled into flour, its low gluten content will not make a good loaf of raised bread. It can be combined with other flours that do have sufficient gluten to make leavened bread or used in flat breads. Barley flour and flakes have a light nutty flavor that is enhanced by toasting. Whole barley is commonly used to add thickness to soups and stews.

Recently, a hull-less form has become available on the market through a few suppliers. This is whole grain barley with all of its bran and germ intact and should have the most nutrients of any form of this grain available. I have not yet been able to discover yet how suitable it is for long term storage.

BUCKWHEAT: Buckwheat is another of those seeds commonly considered to be a grain, but which is not a true cereal. It is

a close relative to the docks and sorrels. The "grain" itself is a dark, three cornered seed resembling a tiny beechnut. It has a hard, fibrous hull requiring a special buckwheat huller to remove it. Here in the U.S., it is most often used in pancakes, biscuits and muffins. In Eastern Europe and Russia it is known in its toasted form as "kasha". In the Far East, it's often made into "soba" or noodles. It's also a good bee plant, producing a dark, strongly flavored honey. The flour is light or dark depending on how much of the hull has been removed before grinding. Dark flour is much more strongly flavored than lighter flour, but because of the high fiber and tannin content of its hull it is not necessarily more nutritious. Buckwheat is one of those foods with no middle ground in peoples opinions -- they either love it or they hate it. Like amaranth, it's high in lysine, an amino acid commonly lacking in the true cereal grains.

CORN (maize): Corn is the most common grain crop in the U.S., but it is mostly consumed indirectly as animal feed or even industrial feedstock rather than directly as food. As one of the "Three Sisters" (corn, squash and beans) it was the staple grain of nearly all of the indigenous peoples of the American continents before the advent of European colonization. It comes in an amazing variety of forms with some being better suited for a particular purpose than others. The varieties intended to be eaten as fresh, green corn are very high in sugar content and do not dry or store well. The other varieties are the flint, dent, flour, and popcorns. All of them keep well when they have been properly dried. To a certain extent, they're all interchangeable for purposes of grinding into meal (sometimes known as polenta meal) or flour (very finely ground corn, not cornstarch), but some make better meal than flour and vice versa.

As a general rule of thumb, the flint varieties make better meal as they have a grittier texture than the other corns. If meal, hominy and hominy grits (commonly called just "grits") are what you are most interested in, use the flint type. If you intend to make corn masa for tortillas and tamales, then the flour type is what you want, but it is seldom found on the commercial market so the dent type is next best. Popcorn is what you need if you want to pop it for snacks and it can also be ground into meal or flour. It seems to me it makes a very good meal, but it's a bit gritty for flour. It's also difficult to hull it with alkali treatment. Your mileage may vary. Yellow dent corn seems to be the most commonly available variety among storage food dealers and will work fine for almost any purpose but popping.

Popcorn is one form of a whole grain available to nearly everyone in the U.S. if they know where to look. It is so popular as a snack food, particularly in movie theaters and events like fairs and ball games, that even the smallest of towns will generally have at least one business selling it in twenty-five or fifty pound bags. Since it's meant to be eaten it's safe for food. To be at its most "poppable", this corn needs to have a moisture content between 13.5%-15.5% which makes it just a little too moist for ideal storage. A small amount of drying will need to be done before it's packed away. If wanted for popping later, it can always be re-hydrated by sprinkling a tablespoon

of water per quart of kernels, shaking vigorously and allowing it to be absorbed for a day or two. If you still get too many "old maids" or unpopped kernels then repeat the process once more. Popcorn is harder than the other varieties of corn so if your mill is not of the heavy duty sort you may want to consider cracking the popcorn into coarse pieces first then grinding into finer textured meal.

Once you've decided between flint, dent or popcorn, (the flour types are difficult to find commercially) you now have to decide upon it's color: There are yellow, white, blue, & red dried varieties. The yellow and white types are the most common by far with the blues and reds mostly being relegated to curiosities, though blue corn has been gaining in popularity these last few years. It should be kept in mind that white corn does not have the carotene (converts into vitamin A) content of yellow corn. Since vitamin A is one of the major limiting vitamins in long term food storage, any possible source of it should be utilized. For this reason I suggest storing yellow rather than white corn. Additionally, much of the niacin content of corn is chemically bound up in a form not available for human nutrition unless it has been treated with an alkali. This is really of importance only if 85% or more of your daily calorie intake will come from corn, but grits, hominy or corn masa (for tortillas and tamales) are traditional uses for this grain and can go a long way toward increasing the number of recipes you can make with it. Give them a try, they're really quite good.

MILLET: Millet is an important staple grain in North China and India, but is little known as a food in the U.S, where we mostly use it as bird feed. The grain kernels are very small, round, and usually ivory colored or yellow, though some varieties are darker. The lack of gluten and a rather bland flavor may account for the anonymity of this grain but it has a more alkaline pH than other grains and makes it very easy to digest. It also has a higher iron content than any other grain but amaranth. It swells a great deal when cooked and supplies more servings per pound than any other grains. When cooked like rice it makes an excellent breakfast cereal. It has little gluten of its own, but mixes well with other flours.

OATS: Though the Scots and the Irish have made an entire cuisine from oats, it is still mostly thought of in the U.S. as a bland breakfast food. Seldom found as a whole grain, it's usually sold processed in one form or another. Much like barley, oats are a difficult grain to separate from their hulls. Besides its longtime role as a breakfast food, oats make an excellent thickener of soups and stews and a filler in meat loafs and casseroles. Probably the second most common use for oats in America is in cookies and granolas. A little creative thought can really increase their culinary range.

Listed below in order of desirability for storage are the forms of oats found in this country. Rolled and cut oats retain both their bran and their germ.

Oat groats: These are whole oats with the hulls removed. They are

not often found in this form, but can sometimes be had from natural food stores and some storage food dealers. Oats are not the easiest thing to get a consistent grind from so producing your own oat flour takes a bit of experience.

Steel cut oats: Also known as Irish, pinhead or porridge (but so are rolled) oats. These are oat groats which have been cut into chunks with steel blades. They're not rolled and look like coarse bits of grain. This form can be found in both natural food stores (sometimes much cheaper) and many supermarkets.

Rolled oats: These are also commonly called old fashioned, thick cut or porridge oats. To produce them, oat groats are steamed and then rolled to flatten. They can generally be found wherever oats are sold. They take slightly longer to cook than do the quick cooking oats, but they retain more flavor, texture and nutrition. This is what most people will call to mind when they think of oatmeal.

Quick cooking rolled oats: These are just steamed oat groats rolled thinner than the old fashioned kind above so that they will cook faster. They can usually be found right next to the thicker rolled oats.

Instant rolled oats: These are the "just add hot water" or microwave type of oat cereals and are not particularly suited for a storage program. They do, however, have uses in "bug out" and 72 hour food kits for short term crises.

Whole oats: This is with the hulls still on. They are sold in seed stores and sometimes straight from the farmer who grew them. Unless you have some means of getting the hulls off, I don't recommend buying oats in this form. If you do buy from a seed supplier, make certain that they have not been treated with any chemicals that are toxic to humans.

QUINOA: Quinoa is yet another of the grains that is not a true cereal. It's botanical name is Chenopodium quinoa (pronounced "keen-wah"), and is a relative of the common weed Lambsquarter. The individual kernels are about 1.5-2 mm in size and are shaped rather like small flattened spheres. When quinoa is cooked, the germ of the grain coils into a small "tail" that lends a pleasant crunch. This exotic grain should be thoroughly washed before cooking in order to prevent it from tasting bitter. There are several varieties of quinoa that have color ranging from near white to a dark brown. The larger white varieties are considered superior and are the most common.

RICE: Rice is the most commonly consumed food grain in the world. The U.S. is the leading exporter of it, though we actually only produce about 1% of the global supply. The majority of the world's rice is eaten within five miles of where it was grown.

Much like wheat and corn, rice comes in a number of varieties, each

with different characteristics. They are typically divided into classes by the length of their kernel grains; short, medium and long.

Short grain rice: The short grain variety is a little softer and bit moister when it cooks and tends to stick together more than the longer rices. It has a sweeter, somewhat stronger flavor than long grain rice.

Medium grain rice: The medium grain variety is not very common in the States. It has flavor like the short variety, but with a texture more like long.

Long grain rice: The long grain variety cooks up into a drier, flakier dish than the shorter types and the flavor tends to be blander. It is the most commonly found size of rice on American grocery shelves.

Each of the above may be processed into brown, white, parboiled or converted and instant rice. Below is a short discussion of the differences between the various types.

Brown rice: This is whole grain rice with only the hull removed. It retains all of the nutrition and has a pleasant nutty flavor. From a nutritional standpoint it is by far the best, but it has one flaw: The essential oil in the germ is very susceptible to oxidation and soon goes rancid. As a result, brown rice has a shelf life of only about six months from the date of purchase unless given special packaging or storage. Freezing or refrigeration will greatly extend this. It's possible to purchase brown rice from long term food suppliers already specially packaged in air tight containers with an inert nitrogen atmosphere or you can do it yourself. In this kind of packaging, (if properly done), the storage life can be extended for several years.

Converted rice: Converted rice starts as whole rice still in the hull which undergoes a process of soaking and steaming until it is partially cooked. It is dried, hulled and then polished to remove the bran and germ. The steaming process drives some of the vitamins and minerals from the outer layers into the white inner layers. This makes it more nutritious than polished white rice, but also makes it more expensive. Its storage life is the same as regular white rice.

White rice: This is raw rice that has had its outer layers milled off, taking with it about 10% of its protein, 85% of its fat and 70% of its mineral content. Because so much of the nutrition is lost, white rice sold in the U.S. has to be "enriched" with vitamins to partially replace what was removed.

Instant rice: The type of rice is fully cooked and then dehydrated needing nothing more than the addition of water to reconstitute it. In a pinch, it's not even necessary to use hot water. It's not particularly suitable for inclusion in storage programs, but it does have a place in "seventy-two hour" and other short-term emergency kits. The white variety is by far the most common, but in the last few years instant brown rice has made an appearance on the market.

RYE: Rye is well known as a bread grain in the U.S. It has dark brown kernels longer and thinner than wheat, but less gluten. Bread made from this grain tends to be somewhat dense unless gluten is added (often in the form of a lot of wheat flour) with color that ranges from pale to dark brown. German pumpernickel, made with unrefined rye flour and molasses, is the darkest, densest form.

SORGHUM: Sorghum is probably more widely known here in the States for the syrup made from it. Also known as "milo", it is one of the principle cereal grains grown of Africa. Its seeds are somewhat round, a little smaller than peppercorns, of an overall brown color with a bit of red and yellow mixed in. The varieties called "yellow endosperm sorghum" are considered to have a better taste. It is a major feed grain in the Southwestern U.S. and is where the vast majority of the national production goes. Like most of the other grains, sorghum is low in gluten, but the seeds can be milled into flour and mixed with higher gluten flours or made into flat breads, pancakes or cookies. In the Far East, it is cooked and eaten like rice, while in Africa it is ground into meal for porridge. It's also fermented for alcoholic beverages.

TRITICALE: Triticale is not a creation sprung from the smooth brows of *Star Trek* script writers. It is, in fact, a cross or hybrid between wheat and rye. This youngest of grains combines the productivity of wheat with the ruggedness of rye and has a high nutrition value. The kernels are gray-brown, oval shaped larger-than-wheat and plumper than rye. It can be used in much the same way as either of its two parents. It will make a raised bread like wheat does, but the gluten is a bit weak so wheat flour is frequently added to strengthen it. Because of the delicate nature of its gluten, excessive kneading must be avoided. Although it is the youngest of the grains, it's been around for decades, but has curiously never achieved much popularity. Whether this is for reasons of agricultural production or public acceptance I don't know.

WHEAT: Wheat comes in a number of different varieties. Each variety is more suitable for some purposes based on its characteristics. The most common classifications for its varieties are spring or winter, hard or soft, red or white.

The hard wheats have kernels that tend to be small, very hard and with high gluten contents. Low gluten wheat does not produce as fine a loaf as high gluten wheat, though it can still be used for yeast breads if necessary. As a general rule, hard varieties have more protein than soft varieties.

The soft wheats have kernels tending to be larger, plumper and softer in texture than hard wheats. Their gluten content is less and are used in biscuits, pastries, quick breads, pastas, and breakfast

cereals where a higher gluten content would contribute an undesirable tougher texture.

Winter wheats are planted in the fall, over winter in the field and are harvested the next summer. Spring wheats are planted in the early spring and are harvested in the fall. Red wheats comprise most of the hard varieties while white wheats comprise most of the soft. Recently, hard white wheats have been developed that are very suitable for raised bread making. Some feel the hard white varieties make a better tasting whole wheat bread than the hard red.

The hard red varieties, either spring or winter, are the most commonly stored because of their high protein and should have no less than 12%. The hard white spring wheats are still relatively new and are not yet as widespread. They have the same excellent storage characteristics as the hard red wheats.

A.2 LEGUME VARIETIES

Unless you are willing to spend a great deal of money on preserved meats, a food storage program not including a large quantity of legumes is simply incomplete. There are few non- animal foods that contain the amount of protein to be found in dried beans, peas, and lentils. The varieties commonly available in this country have protein contents ranging from 20%-35%. As with most non-animal proteins, they are not complete in themselves for purposes of human nutrition, but become so when they are combined with the incomplete proteins found in grains. It is for this reason that grains and legumes are so often mentioned together. In cultures all over the world, it is common to find the two served together at a meal, making a complete protein, even when those doing the serving have no scientific understanding of nutrition at all.

The legume family, of which all beans, peas, lentils, and peanuts are a part, is one of the largest in the plant kingdom. Because of this and the many thousands of years of development and cultivation that man has given them, the variety of edible legumes available to us is huge. Both the appearance and the names of these varieties are colorful and varied. They range from "adzuki beans", a type of soybean from the Orient, to "zipper peas", a commonly found field-pea here in the Southern U.S. Their color can range from a clean white, to deep red, dull green to flat black with thousands of mixtures and patterns of colors.

In spite of this incredible variety of names and colors, legumes are largely interchangeable in cooking usage, although some dishes just wouldn't be the same if a different type were used. Below is a partial list of some of the more commonly eaten bean varieties here in the U.S.

BLACK BEAN: Also known as "turtle beans", these small, dark brownish-black, oval-shaped beans are well known in Cuban black bean soup. They are very commonly used in Central and South

America and in China. They tend to bleed very darkly when cooked so they are not well suited to being combined with other beans, lest they give the entire pot a muddy appearance.

BLACK-EYED PEA: Although there is tremendous variation among the many varieties of field-peas eaten throughout the Southern United States, it is black-eyed peas that are the most commonly known nationwide. The coloring of field-peas is as varied as the rest of the legume family, with black-eyed peas being small, oval-shaped with an overall creamy color and, of course, their distinctive black-eye. Dried field-peas cook very quickly and combine very tastily with either rice or cornbread.

CHICKPEA: Also known as the "garbanzo bean" or "cecci pea" (or bean), it tends to be a creamy or tan color, rather lumpily roundish and larger than dried garden peas. Many have eaten chickpeas, even if they've never seen a whole one. They are the prime ingredient in hummus and falafel and are one of the oldest cultivated legume species known, going back as far as 5400 B.C. in the Near East.

KIDNEY BEANS: Just like the rest of the family, kidney beans can be found in wide variety. They come in both a light and dark red color in their distinctive kidney shape. Probably best known here in the U.S. for their use in chili, they figure prominently in Mexican, Brazilian and Chinese cuisine.

LENTILS: Lentils are an odd lot. They don't fit in with either the beans or the peas and occupy a place by themselves. Their shape is different from the other legumes being roundish little discs with colors ranging from muddy brown, to green to a rather bright orangish-red. They cook very quickly compared to the larger beans and have a distinctive flavor. They are much used in Far Eastern cuisine from Indian to Chinese.

LIMA BEANS: In the Southern U.S., they are also commonly called "butter beans". They are one of the most common legumes found in this country in all manner of preservation from the young small beans to the large fully mature type. Their flavor is pleasant, but a little bland. Their shape is rather flat and broad with colors ranging from pale green to speckled cream and purple.

PEANUTS: The peanut, commonly known outside the U.S. as the "groundnut", is not actually a nut at all, but a legume. They are another odd species not much like the more familiar beans and peas. Whatever their classification peanuts are certainly not unfamiliar to U.S. eaters. Peanuts have a high protein percentage and even more fat. They are one of the two legume species commonly grown for oilseed in this country, and are also used for peanut butter, and

boiled or roasted peanuts. Many Central and South American, African and Chinese dishes incorporate peanuts so they are useful for much more than just a snack food or cooking oil.

PINTO BEANS: Anyone who has eaten Tex-Mex food has probably had the pinto bean. It is one of the most commonly eaten beans in the U.S., particularly in the Southwestern portion of the country. Stereotypically bean shaped, it has a dappled pattern of tans and browns on its shell. Pintos have a flavor that blends well with many foods. When ground together with white or navy beans they make my favorite home-made version of falafel.

SOYBEANS: An entire university could be founded on the culinary and industrial uses of the soybean. It is by far the legume with the highest protein content in commercial production as well as being the other legume oilseed alongside the peanut. The beans themselves are small, and round with a multitude of different shades. Because of their high oil content, they are more sensitive to oxygen exposure than other legumes and precautions should be taken accordingly if they are to be kept for more than a year in storage. Although the U.S. grows a very large percentage of the global supply, we consume virtually none of them directly. Most of them go into cattle feed, are used by industry or exported. What does get eaten directly has usually been processed in some fashion. Soybean products range from tofu, to tempeh, to textured vegetable protein (TVP) and hundreds of other uses. They don't lend themselves well to just being boiled until done and eaten the way other beans and peas do. For this reason, if you plan on keeping some as a part of your storage program (and you should) you would be well served to begin to learn how to process and prepare them now when you're not under pressure to produce. That way you can throw out your mistakes and order pizza, rather than having to choke them down, regardless.

A.3 TYPES OF AVAILABILITY OF GRAINS AND LEGUMES

Grains and legumes of all types may be purchased in a number of different fashions depending largely on where you live and what time of year it is. The following will cover the various steps in the processing chain where they might be found starting with the forms most immediately suitable for storage and progressing all the way back to the farmer.

Each type of availability has its good and bad points. As you might expect, the more processing the product receives, the higher its price is likely to be. The further back along the processing chain you go the cheaper the product should become in terms of purchase price. It will, however, cost you more in time and effort to get it into a condition ready to put it into storage.

The easiest and simplest way to incorporate grains and legumes into your storage program is to purchase your items "pre-cleaned and

pre-packaged". This is grain or legumes that have been harvested, cleaned and put up in bags or other containers-possibly even going so far as to already be packaged for long-term storage. If you don't live in the area where they are grown, it is probably your only option.

If you want to purchase in bulk then you may be able to find "pre-cleaned" which means that it has been passed through fans, screens or sieves to remove chaff, smut balls, insect parts, mouse droppings and other debris. It probably won't be in any form of packaging and you may have to provide your own container. There may be minimum purchase amounts as well. If the moisture content is in the right range then nothing will need to be done other than to put it up in your own storage packaging. Be certain to make sure it is intended for human food use, otherwise read the cautionary text below.

Should you happen to live in the area where the type of grain or legume that you are interested in purchasing is grown you may be able to purchase direct from the producer or distributor.

If you are interested in doing this, it may be possible to find your product "field-run" which means that it's been harvested and sold shortly thereafter. It will not have been given any cleaning or processing and is likely to be rather dirty depending upon the conditions under which it was grown and harvested.

A second form called "field-run from storage" is product that has been harvested and then put into storage for a time. It will have all of the dirt and detritus of field run grain and whatever it may have picked up from the silo as well.

IMPORTANT NOTE: If you have purchased your grains and legumes from a foods dealer then you needn't worry about hidden mold infections, fungicides or insecticides that are unsafe for human consumption. In the U.S., the products will have been checked several times by Federal and State agriculture departments and probably by the major foods dealers as well, to ensure its quality.

This is not necessarily the case when you purchase your grains or legumes directly from the farmer or elevator operator as field-run or field-run from storage grain. Nor is it necessarily the case if you've made the decision to utilize grains marketed as animal feed. Inspection procedures vary from nation to nation, so if you buy outside of the U.S. inquire of your supplier.

If you are buying your grains and legumes from some place other than a foods dealer, you need to know the history of what you are buying. There is the remote possibility that field-run from storage or any grade of grain not specifically sold for human consumption may have had fumigants, fungicides or insecticides not certified as safe for human foods added while it was in the bin. It is important to know what it has been treated with before you buy it.

Straight field-run grain, other than being dirty, is not likely to have had anything added to it that would make it undesirable for human

consumption. There is, however, the also remote possibility it may have been infected with fungi that would make it unsafe for eating.

One of these fungal infections of grain is called "ergot". This fungal disease affects the flowering parts of some members of the grass family, mostly confined to rye. Consuming the fungus causes a nervous disorder known as St. Anthony's Fire. When eaten in large quantities the ergot alkaloids may cause constriction of the blood vessels, particularly in the extremities. The effects of ergot poisoning are cumulative and lead to numbness of the limbs and other, frequently serious, symptoms.

The fungus bodies are hard, spur like, purple-black structures that replace the kernel in the grain head. The ergot bodies can vary in size from the length of the kernel to as much as several times as long. They don't crush as easily as smut bodies of other funguses. When they are cracked open, the inner broken faces can be off-white, yellow, or tan. The infected grain looks very different from ordinary, healthy rye grains and can be spotted easily. Ergot only rarely affects other grains and will generally afflict rye only when the growing conditions were damp. If you purchase field run rye, you should closely examine it first for the presence of ergot bodies. If you find more than a very few, pass up that grain and look elsewhere.

Ergot is typically not a common problem in the U.S and is easily spotted when it does occur. Other grain fungi, however, are much harder to spot and also have serious consequences should they be consumed. The various species of "Aspergillus" and "Fusarium" molds can be a problem almost anywhere and should be kept in mind. *Please see Section III.B Molds In Grains and Legumes for more information concerning this.*

Sometimes grain in the form of animal feed or seed grain/legumes is available. Keep in mind animal feeds may have a higher contaminant level than what is permissible for human consumption. Under certain circumstances, the USDA allows the sale of grain or legumes for animal feed that could not be sold for direct human food use. It may even be mixed varieties of one grain and not all one type. Seed grains, in particular, must be investigated carefully to find out what they may have been treated with. It is quite common for seed to have had fungicides applied to them, and possibly other chemicals as well. Once treated, they are no longer safe for human or animal consumption.

If you do purchase field-run grain of any sort, examine it closely for contamination and moldy grain. Ask the farmer or distributor whether it has been tested for mold or "mycotoxin" (fungal toxin) content. This is especially the case if you are buying field-run CORN, RYE, SOYBEANS or RICE. When you purchase direct from the field, you may be getting it before it has been checked. Be certain of what it is that you are getting and ask questions if you choose to go this route. Know who you are dealing with. Unless you just can't find any other source, I don't recommend using animal feed or seed grains for human food.

*Please see section III.B.3 " Molds In Grains and Legumes" for

further information.*

A.3.1 MOISTURE CONTENT

The moisture content of the grain or legume you want to put by has a major impact on how long you will be able to keep it in storage and still remain nutritious and edible. Some of the available literature states that grain with a moisture content as high as 13% can be safely put up, but there is a risk to keeping it at that moisture level that should be understood.

The outside of every kernel of grain and bean you buy or grow hosts thousands of fungi spores and bacteria. This is all perfectly natural and is not a reason for alarm. The problem lies in that at moisture levels between 13.5% to 15% some fungal species are able to grow and reproduce. Aerobic bacteria (needing free oxygen to survive) require moisture in the 20% range. If you have grain with a moisture content as high as 13% you are perilously close to having enough moisture to enable mold growth which could lead to the spoilage and loss of your product. For this reason, I suggest you keep all grains and legumes to a moisture content of no more than 10%. An exception to this is raw peanuts which are particularly susceptible to an Aspergillus mold growth that produces aflatoxin (a type of mycotoxin) and should be stored with an 8% moisture content or less.

If you do not have a clue as to what the moisture level of your grain is here are several methods to determine it. The first method requires a great deal more oven time, but is the simplest and has less room for error to creep in. The second method is much quicker, but greater care must be taken to prevent mistakes.

Highly precise moisture content measurements generally require equipment and facilities beyond the scope of what can be had by the average person. It is still possible though to make some determinations that will be of real use for our purposes.

You'll need some way to measure weight with a fair degree of accuracy. The better the scale you use, the more reliability you'll have in your determinations. Provided that it will weigh accurately to the half-ounce or less, any scale that can be calibrated with a known check weight will do. Even postal scales can be made to serve if they are carefully calibrated against a known weight. Many individuals interested in starting storage programs may have grain weight scales used in ammunition reloading that might serve well.

Also necessary is a thermometer capable of withstanding and accurately measuring oven temperatures. As many bakers can tell you, home oven thermostats are often notoriously inaccurate so it is better to rely on a decent thermometer. Most kitchen supply stores can supply one that is oven safe and will accurately measure to the degree Fahrenheit or Celsius.

Proper technique calls for preheating the oven for a half-hour or

more before starting the dehydrating process so that it will be of a uniform heat throughout. The sample pan should be placed on the middle rack as close to the vertical and horizontal center of the oven as possible. The bulb or dial of the thermometer should be placed next to the pan.

METHOD ONE.

This method is for measuring moisture content in whole grains and legumes. Grain flours or meals, milk powders and any other finely textured foods should use method two detailed below.

To be done prior to measuring -- choose a shallow heat resistant container that has a close fitting lid. Clean it thoroughly and dry it completely in your oven for 10-15 minutes. Allow it to cool and then weigh it carefully. This will give you the tare weight or what your container weighs empty.

Depending on how your scale is calibrated you can use a smaller sample size than what is indicated below. Using the twenty-ounce sample mentioned in the following text will allow for fairly accurate readings with the average postal scale. A scale that will measure to the gram could use as small a sample as 20 grams. A powder scale could use even less, but the smaller your sample size becomes the more finicky care you must take not to allow error to creep in. Keep your sample size large enough to easily work with.

Allowing for the weight of the sample pan, measure out a weighed twenty-ounce representative sample of the grain or legumes in question. Ideally, you should mix the entire lot thoroughly immediately before removing the sample, but if this is not possible then take it from the middle center of the container. It is important that you use care in this measurement since it will affect all following determinations.

Put the sample in the container making sure it is not more than an inch deep. Place it in the oven with the lid off and allow to heat. Below is a table giving the oven temperatures and times per grain or legume type:

Time and Temperature Settings for Determining Moisture Contents of Whole Seeds.

Seed	Oven Temperature Deg. F	C	Oven Time Hours
Barley	266	130	20
Beans	217	103	72
Corn	217	103	72
Oats	266	130	22
Rye	266	130	16
Sorghum, millet	266	130	18

Soybeans, peanuts	217	103	72
Wheat, rice	266	130	19

When the dehydration period is over place the close fitting lid on the sample pan and allow to cool in the oven with the door closed. Remove the pan and carefully weigh it.

A one ounce loss in weight indicates your grain has a roughly five percent moisture content, 2 ounces indicates that it has a 10% moisture content, etc., etc. You might even be able to cut it as fine as a half oz loss, but I wouldn't try to take it further than that.

Obviously, this is only a rough measure, but it works and can be done with postal or dietetic scales that are available virtually everywhere. As I mentioned above, if you have a scale with a finer calibration it is possible to use a smaller sample size and achieve the same result.

If anyone has a better way of measuring moisture levels which can be done without a lab or special equipment I'd surely like to hear it.

METHOD TWO

This method is much faster to use than the first, but greater care must be taken to prevent error. It can be used to determine moisture contents of whole grains and legumes, flours, meals and various food powders.

The same equipment as was used in Method One will be required here as well as a low-RPM grain mill or some other device that can reduce a quantity of the grain to a meal consistency with only minimal heating of the sample. If the food to be tested is already at a meal consistency or finer then it can be used as-is.

Grind a quantity of product you want to measure the moisture content of. Take care to grind the sample slowly enough to keep friction heat build up to a minimum or else moisture will be lost due to heat evaporation before it can be weighed.

Immediately upon finishing the grinding, weigh out your sample so as to minimize unmeasured moisture loss.

Place the sample in the oven and dehydrate in the manner used in Method One for a period of two hours at a temperature setting of 275 deg. F (135 deg. C). When the heating period is finished cover with the tight-fitting lid and allow to cool in the oven. Remove and weigh carefully. Moisture determination is the same as above.

A.3.2 CLEANING IT YOURSELF

If you've chosen to purchase field-run grain or if the pre-cleaned product you've bought isn't clean enough, you can do it yourself.

The fastest and easiest method is "fanning", a form of winnowing. This is done by pouring the grain slowly through the air stream of a fan or blower into a clean, deep container such as a cardboard box or trash can. The wind blowing through the falling grain will blow out most of the broken kernels, chaff, smut balls, mouse droppings, etc. If you're losing too much good grain, try turning the fan down or moving it further back from the container. The deep container will cut down on the amount of kernels that bounce out. Repeat fanning as necessary until the grain is clean enough to suit or you've blown all of the lighter contaminants out.

If the fanning didn't get the grain clean enough it can be further cleaned by running it through a screen or sieve. This should be made with holes just big enough to pass an average sized grain of what it is you're cleaning. Obviously, the size of the holes will necessarily vary depending upon the kernel size of the grain.

Should the kernels still not be clean enough to suit then you'll just have to resort to hand picking out the offending particles. I'd strongly suggest doing this just prior to grinding where it can be done in small batches rather than trying to do your entire storage all at once. It's much easier to do a few pounds at a time than fifty or a hundred.

If you have it in mind to wash the grain, this should not be done prior to storage, but, rather, just before use. After it's been rinsed, it should be dried immediately in the oven by placing it no deeper than 1/2 inch and heated at 150 deg. F for an hour. It should be stirred occasionally to improve drying.

A.4 STORING GRAINS AND LEGUMES

Now that you have properly prepared your grains and legumes for storage, they are ready to be packaged.

For methods and procedures of packaging please see section IV.

IV. Specific Equipment Questions
A. Storage Containers
B. CO2 and Nitrogen
C. Oxygen Absorbers
D. Desiccants
E. Diatomaceous Earth

B. DRY MILKS

Got milk? In the refrigerator, right? Milk is a great source of essential amino acids and vital calcium, but in its fresh liquid form it

is a highly perishable commodity. Fortunately, milk can be found in several forms that lend themselves to food storage. The various types of dry milks are the best suited to the task.

B.1 TYPES OF DRY MILKS

NONFAT: This is pasteurized skim milk reduced to a powdered concentrate. It can be found in two forms, regular and instant. They are both made from milk in a spray-drying process, but the instant variety has been given further processing to make it more easily soluble in water than regular dry milk. Both types have the same nutrient composition. The regular variety is more compact and requires less storage space than the instantized variety, but it is more difficult to reconstitute. The most easily found variety is the instant, available in nearly any grocery store. The regular variety has to be sought out from baking and restaurant suppliers and storage food dealers.

It takes 3.2 oz or about 3 tablespoons of instant nonfat dry milk added to 8 oz of water to make 1 cup of milk you can drink or cook with just like fresh milk, albeit with a considerable flavor difference. Combining the dry milk with water at least several hours before you plan to use it gives it time to dissolve fully and to develop a fresher flavor. Shaking the fluid milk vigorously will incorporate air and will also help to improve flavor. Add the powder to baked goods, gravies, smoothies, hot cereals, casseroles and meat loaf as a nutrition booster. It can also be used to make yogurt, cheese and most any cultured dairy product that does not require a high fat content.

FLAVORED NONFAT: This may be found packaged in a variety of forms from a low calorie diet drink (artificially sweetened) to the other end of the scale, as cocoa mix or malted milk. The key ingredient is the dry milk so buy and store these products accordingly.

WHOLE MILK: This is whole dry milk with all of its fat content and therefore has a shorter shelf life than nonfat. Other than that, it can be used in exactly the same way. Dry whole milk is difficult to find, but can sometimes be found where camping and outback supplies are sold.

BUTTERMILK: Dry buttermilk is for use in recipes calling for buttermilk. Since it has a slightly higher fat content than nonfat dry milk, it generally does not keep as long.

B.1.1 BUYING DRY MILK PRODUCTS

(a)- Be sure the dry milk you are buying has been fortified with vitamins A and D. All of the nonfat dry milks I've seen come fortified with these two vitamins. The dry buttermilk does not come this way, at least the SACO brand does not. I don't know if the flavored mixes and

the dry whole milk do or not.

(b)- There should be no artificial colors or flavors. I believe it is illegal to add preservatives to any dry milk sold in the U.S. so a claim of "no preservatives" on the label is of no consequence. Other nations may be different, however.

(c)- "Extra Grade" on the label indicates the manufacturer has held to higher processing and quality standards and the milk is somewhat lower in fat, moisture and bacterial content, is more soluble, and has fewer scorched particles.

There are still some manufacturers of dry milk that sell ordinary Grade A product, but they are becoming fewer. Every brand of instant powdered milk in my local grocery store is the Extra Grade, even the generic store brand. This, too, may vary outside of the States.

(d)- Try to buy your dried milk in containers of a size that makes sense for the level of consumption in the household. Once it is opened, powdered milk has a short shelf life before undesirable changes in flavor and nutrient content occurs. If you buy large packages and do not use much at one time, consider breaking it down and repackaging into smaller containers at the time of purchase.

(e)- As with any storage food you buy, try to deal only with reputable dealers. It is particularly important to do this with dry milk because of its short shelf life and sensitivity to storage conditions. Check expiration dates, then date and rotate packages.

B.2 STORING OF DRY MILKS

Dry milk products are probably the most sensitive to environmental conditions storage foods there are, particularly to temperature and moisture content. Their vitamins A and D are also photosensitive and will break down rapidly if exposed to light.

The area where your dry milk is stored should be kept as cool as possible. If it is possible to do so, air-conditioning or even refrigeration can greatly extend the nutrient shelf life.

If the storage container is transparent or translucent then it should be put into a second container opaque to light or stored in a dark room.

Dry milk will absorb moisture and odors from the air so storage containers should be impervious to both air and moisture. The drier it can be kept, the better it will keep. The use of desiccants is an excellent idea. Oxygen also speeds decomposition. Powdered milk canned with nitrogen or carbon dioxide to replace air (which contains oxygen) will keep longer than powdered milk exposed to air. Vacuum canning also decreases the available oxygen.

If the dry milk purchased was not packaged for long term storage

then it should be repackaged right away.

I purchase the instant variety at my local grocery and repack it when I get it home. I've seen a number of methods used for this and any of them should work.

The method I now use is to pour the powder into clean, dry half-gallon canning jars. Once the jars are filled I add a small desiccant pack and seal. They are dated and stored in the ubiquitous cool, dark place. They must be guarded against breakage, but they offer the advantage of not holding odors, thus allowing for reuse after suitable cleaning. Since they are as transparent the contents must be protected against light. Vacuum sealing and then storing in a dark place may be the best method. Larger jars of 1 gallon size could be used and then re-vacuum sealed after each use. An O2 absorber would take care of any remaining oxygen and would, itself, last longer when used in conjunction with the vacuum sealer. Being glass, the jar can be reused as well as the lid and ring if they're properly cleaned.

Clean, sound plastic one and two liter soda bottles can also be used, but probably should be used just once since the plastic is somewhat permeable and will hold odors.

If you have access to a can sealer, #10 cans make wonderful storage containers for dry milk, particularly if used in conjunction with O2 absorbers.

Another method I've seen used is to remove the paper envelopes of milk powder from the cardboard box they come from the grocery store in and to put them in dated plastic bags. These bags are not sealed. The unsealed bags are then placed in a larger, air tight, opaque container. I've heard of plastic buckets, fifty cal and 20 mm ammo cans being used for this purpose. A healthy quantity of desiccant was also placed in the container. This would be another area where O2 absorption packets should serve well. It's important to remember the containers should be clean and odor-free.

Please see Section IV Specific Equipment Questions for information concerning the proper use of containers, desiccants, compressed gasses, dry ice and oxygen absorbers.

B.2.1 SHELF LIFE OF DRY MILKS

From: SacoFoods@aol.com (Amy Thompson)
To: Dunross@dkeep.com (Alan Hagan)
Subj: SACO Mix'nDrink Instant Pure Skim Milk
Date: May 9, 1996

Dear Mr. Hagan:

Thank you for your e-mail today and for your interest in SACO Mix'nDrink Pure Skim Milk.

Our Mix'n Drink will keep its nutrition value for up to about two years if kept cool and dry, and the only vitamins that actually decrease over time are the vitamins A and D. These are not shelf-stable vitamins and are sensitive to heat and light. A good rule of thumb to follow is that the vitamins A and D will dissipate at a rate of about 20% every year if stored properly. The less heat and moisture the milk is exposed to, the better the vitamins will keep. A freezer could extend the shelf life, as long as the powder does not get moisture in it. If you had to put a time limit on the Mix'nDrink, for rotation purposes, I would date it at two years after the date of purchase.

After opening a package of dry milk, transfer the powder to a tightly covered glass or metal container (dry milk can pick up odors from plastic containers) and keep it in the refrigerator. Unsealed nonfat dry milk keeps for a few months; dry whole milk for a few weeks.

From: SacoFoods@aol.com (Amy Thompson)
To: Dunross@dkeep.com (Alan Hagan)
Subj: SACO Mix'nDrink Instant Pure Skim Milk
Date: May 21, 1996

Dear Mr. Hagan:

Since vitamins A and D are heat and light sensitive, I would say that your 1 1/2 year shelf life is very reasonable. If you are trying to determine when the nutritional value has been affected more than 40%, as you previously indicated, you should be pretty safe with that time element, as long as it is not exposed to extreme heat.

[Eds note: We were discussing the higher average temperatures found in Florida and other hot climates and the effect that it would have on their dry milk's nutrient content]

C. CANNED GOODS

C.1 CANNED MILK TYPES

Preserved liquid milk comes in a number of forms, none of which are very similar to each other. The most common forms of these packaged milks are as follows:

CANNED MILKS: These are commonly called UHT milks (Ultra High Temperature) for the packaging technique used to put them up. They come in the same varieties as fresh liquid milks: Whole, 2%, 1% and skim. I've even found whipping cream in UHT packaging (Grand Chef - Parmalat), though this may be offered only in the commercial and restaurant trade. In the U.S. they have vitamin D added. The lesser fat content milks do not keep as long as whole milk and their use by dates are correspondingly shorter term. This milk is packaged in aseptic containers, either cans or laminated paper cartons. It has the same composition as fresh milk of the same type, and can be stored at

room temperature because of the special pasteurizing process used. The milk has a boiled flavor, but much less than evaporated milk. The dates are usually for approximately six months. The milk is still usable past its date, but the flavor soon begins to go stale and the cream separates. I am told by a friend who lived in Germany not long after this kind of canned milk began to come on the market there that they were dated for a year.

With a six-month shelf life this type of canned milk naturally requires a much faster rotation cycle than other types. The only brand name for this milk I've seen is Parmalat. Recently, I have discovered that it makes excellent yogurt, losing the boiled tasted

EVAPORATED: This is made from fresh, unpasteurized whole milk. A vacuum-heating process removes 60% of the water; the concentrate is heated, homogenized, and in the States vitamin D is added. It is then canned and heated again to sterilize the contents. It may also have other nutrients and chemical stabilizers added. A mixture of one part water and one part evaporated milk will have about the same nutritional value of an equal amount of fresh milk. There is generally no date or use by code on evaporated milk

Health and nutrition food stores often carry canned, evaporated goat's milk, in a similar concentration.

SWEETENED CONDENSED: This milk goes through much less processing than evaporated milk. It starts with pasteurized milk combined with a sugar solution. The water is then extracted until the mixture is less than half its original weight. It is not heated because the high sugar content prevents spoilage. It's very high in calories, too: 8 oz has 980 calories.

Although it is often hard to find, the label has a stamped date code which indicates the date by which it should be consumed. Sweetened, condensed milk may thicken and darken as it ages, but it is still edible.

C.1.1 SHELF LIFE OF CANNED MILKS

Unopened cans of evaporated milk can be stored on a cool, dry shelf for up to six months. Canned milk (UHT) should be stored till the stamped date code on the package (3 - 6 months). Check the date on sweetened, condensed milk for maximum storage.

C.2 CORROSION PREVENTION OF CANNED GOODS

Some areas have difficulty storing metal canned goods for long periods of time. This is usually caused by very high humidity or exposure to salt in a marine environment. If this is a problem, it is possible to extend the life of metal cans by coating their outsides.

I've seen this used on boats here in Florida, especially when loading for a long trip. There are at least four methods that can be used to do this:

PARAFFIN METHOD: Using a double boiler, paraffin is melted and brushed on the clean, unrusted cans. Be certain to get a good coat on all seams, particularly the joints. If the can is small enough, it can be dipped directly into the wax. Care must be taken to not cause the labels to separate from the cans. Do not leave in long enough for the can to get warm.

PASTE WAX METHOD: Combine 2-3 oz. of paste or jelly wax with a quart of mineral spirits. Warm the mixture CAREFULLY in its container by immersing it in a larger container of hot water. DO NOT HEAT OVER AN OPEN FLAME! Stir the wax/spirits thoroughly until it is well mixed and dissolved. Paint the cans with a brush in the same manner as above. Place the cans on a wire rack until dry.

SPRAY SILICONE: A light coating of ordinary spray silicone may be used to deter rust. Spray lightly, allow to dry, wipe gently with a clean cloth to remove excess silicone.

CLEAR COATING: A clear type of spray or brush on coating such as Rustoleum may be applied. This is best suited for larger resealable cans, but will keep them protected from corrosion for years.

D. SUGAR, HONEY AND OTHER SWEETENERS

There are a wide number of sugars to be found for purposes of sweetening foods. Fructose is the primary sugar in fruit and honey; maltose is one of the sugars in malted grains; pimentose are found in olives and sucrose is what we know as granulated or table sugar. Sucrose is a highly refined product made primarily from sugar cane though sugar beets still contribute a fair amount of the world supply. Modern table sugar is now so highly refined as to be virtually 100% pure and nearly indestructible if protected from moisture. Powdered sugar and brown sugar are simple variations on granulated sugar and share its long life.

Liquid sweeteners do not have quite the longevity of dry sugars. Honey, cane syrup, molasses, corn syrup and maple syrup may crystallize or mold during long storage. These syrups are chemically not as simple as table sugar and therefore lose flavor and otherwise break down over time.

D.1 TYPES OF GRANULATED SUGARS

Buying granulated sugar and its close cousins is really a very simple matter. Buy a brand you know you can trust and be certain the package is clean, dry and has no insect infestation. There's very little that can go wrong with it.

GRANULATED: Granulated sugar does not spoil, but if it gets damp it will likely cake up or get lumpy. If it does, it can simply be pulverized again until it regains its granulated texture. Granulated sugar can be found in varying textures, coarser or finer. "Castor/caster sugar" is a finer granulation than what is commonly sold as table sugar in the U.S. and is more closely equivalent to our super fine or berry sugar.

POWDERED, CONFECTIONERS, ICING: All names refer to the same kind of sugar, that is white granulated sugar very finely ground. For commercial use there is a range of textures from coarse to ultra-fine. For home consumption, what is generally found is either Very Fine (6X) or Ultra-Fine (10X), but this can vary from nation to nation. Not all manufacturers will indicate the grind on the package though. Sugar refiners usually add a small amount of corn-starch to prevent caking.

Powdered sugar is as inert as granulated sugar, but it is even more hygroscopic and will absorb any moisture present. If it absorbs more than a little it may cake up and get hard. It's difficult to reclaim hardened powdered sugar, but it can still be used like granulated sugar.

BROWN, LIGHT & DARK: In the United States brown sugar is basically just refined white sugar that has had a bit of molasses or sugar syrup and caramel coloring added to it. Dark brown sugar has more molasses which gives it a stronger flavor, a darker color and makes it damp. Light brown sugar has less molasses which gives it a milder flavor, a blonder color and is slightly dryer than the dark variety. For storage purposes you may want to just stock the dark variety. Light brown sugar can be made by combining one fourth to one third white sugar to the remainder dark brown sugar and blend thoroughly.

Both varieties need to be protected from drying out, or they will become very hard and difficult to deal with. Nor do you want to allow them to become damper than what they already are.

There are granulated and liquid brown sugars available, but they don't have the same cooking qualities as ordinary brown sugars. They also don't dry out and harden quite so readily either.

RAW, NATURAL, & TURBINADO: In recent years, sugar refiners have realized that there is a market for less refined forms of cane sugar in the U.S. and have begun to sell this kind of sugar under various names and packagings. None of it is really raw sugar since it is illegal to sell it in the U.S. due to the high impurities level in the truly raw product. All of it has been processed in some form or fashion to clean it, but it has not been subjected to the full refining and whitening processes of ordinary white table sugar. This leaves some of the natural color and a mild flavor in the sweetener. All of these less refined sugars may be stored and handled like brown sugar.

Outside of the United States it is possible to buy truly raw sugar and it can be found under names such as "muscavado", "jaggery" (usually a raw palm or date sugar), "demerara" and others. With all of the molasses and other impurities retained it is quite strong in flavor so would not be suited to general use, but there are recipes that call for it. In spite of moisture and impurities it can be stored like brown sugar since its sugar content is high enough to inhibit most microbial growth.

D.1.1 STORING GRANULATED SUGARS

All granulated sugars have basically the same storage requirements. They need to be kept in air tight, insect and moisture proof containers. For powdered, and granulated sugar you might want to consider using some desiccant in the storage container if your local climate is damp. Since brown sugars and raw sugars are supposed to be moist, they do not need desiccants. Shelf life is indefinite if kept dry, but anything that you intend to eat really should be rotated over time. Time has a way of affecting even the most durable of foods.

I've used brown sugar that was six years old at the time it was removed from storage and, other than the molasses settling somewhat toward the bottom, it was just fine. A friend to whom I gave a bucket of the brown sugar finished it off three years after I gave it to her which was nine years after it was packaged and it, too, was fine.

D.2 TYPES OF HONEY

Honey is probably the oldest sweetener known to man. Its use predates recorded history and has been found in the Egyptian pyramids. It's typically sweeter than granulated sugar by a factor of 25%-40% depending upon the specific flowers from which the bees gather their nectar. This means a smaller amount of honey can give the same amount of sweetening as sugar. The source flowers also dictate the flavor and the color of the sweetener as well. Honey color can range from very dark (nearly black) to almost colorless. As a general rule, the lighter the color and the more delicate the flavor, the greater the price the honey will bring. As you might expect, since honey is sweeter than table sugar, it also has more calories as well -- 22 per teaspoon compared to granulated sugar's 16 per teaspoon. There are also trivial amounts of minerals and vitamins in the bee product while white sugar has none.

Raw honey may also contain minute quantities of botulinum spores and should not be fed to children under one year of age. PLEASE READ THE POST FROM GERI GUIDETTI CONCERNING THIS BELOW. Raw honey is OK for older children and adults. Honey is not a direct substitute for table sugar however, its use in recipes may call for a bit of alteration to get it to turn out right.

Honey comes in a number of forms in the retail market and they all have different storage characteristics:

WHOLE-COMB: This is the bee product straight from the hive. It is the most unprocessed form in which honey comes, being found as large pieces of waxy comb floating in raw honey. The comb itself will contain many unopened honey cells.

RAW: This is unheated honey that has been removed from the comb. It may contain bits of wax, insect parts and other small detritus.

FILTERED: This is raw honey that has been warmed to make it more easy to filter out small particles and impurities. Other than being somewhat cleaner than raw honey it is essentially the same. Most of the trace amounts of nutrients remain intact.

LIQUID: This is honey that has been heated to higher temperatures to allow for easier filtering and to kill any microorganisms. Usually lighter in color, this form is milder in flavor, resists crystallization and generally clearer. It stores the best of the various forms of honey. Much of the trace amounts of vitamins, however, are lost.

SPUN or CRYSTALLIZED: This honey has had some of its moisture content removed to make a creamy spread. It is the most processed form of honey.

D.2.1 BUYING HONEY

Much of the honey sold in supermarkets has been blended from a variety of different honeys and some may have even had other sweeteners added as well. Like anything involving humans, buying honey can be a tricky business. It pays to deal with individuals and brands you know you can trust. In the United States you should buy products labeled U.S. GRADE A or U.S. FANCY if buying in retail outlets. However, be aware there are no federal labeling laws governing the sale of honey, so only honey labeled pure is entirely honey and not blended with other sweeteners. Honey grading is a matter of voluntary compliance which means some producers may be lax and sloppy about it. This can be a real nuisance when producers use words like "organic", "raw", "uncooked" and "unfiltered" on their labels, possibly to mislead. Fortunately, most honey producers are quite honest in their product labeling so if you're not certain of who to deal with, it is worthwhile to ask around to find out who produces a good product.

Honey may also contain trace amounts of drugs used in treating various bee ailments, including antibiotics. If this is a concern to

you, then it would be wise to investigate with your local honey producer what has been used.

D.2.2 STORING HONEY

Honey is much easier to store than to select and buy. Pure honey won't mold, but may crystallize over time. Exposure to air and moisture can cause color to darken and flavor to intensify and may speed crystallization as well. Comb honey doesn't store as well liquid honey so you should not expect it to last as long.

Storage temperature is not as important for honey, but it should be kept from freezing and not exposed to high temperatures if possible. Either extreme can cause crystallization and heat may cause flavor to strengthen undesirably.

Filtered liquid honey will last the longest in storage. Storage containers should be opaque, airtight, moisture and odor-proof. Like any other stored food, honey should be rotated through the storage cycle and replaced with fresh product.

If crystallization does occur, honey can be reliquified by placing the container in a larger container of hot water until it has melted.

Avoid storing honey near heat sources and if using plastic pails don't keep it near petroleum products (including gasoline/diesel engines), chemicals or any other odor-producing products.

D.2.3 RAW HONEY AND BOTULISM

From: Geri Guidetti arkinst@concentric.net

Duane Miles wrote:
>If I recall correctly, honey contains very, very small amounts of >the bacteria that cause botulism. For adults, this seldom causes >problems. Our immune system is capable of dealing with small numbers >of even nasty bacteria, they do it all the time. The problem is when >we get large numbers of bacteria, or when our immune system is damaged >or not yet developed.

>That is where the problem with honey comes in. Some people used to >use honey to sweeten milk or other foods for infants. Infants immune >systems sometimes cannot handle the bacteria that cause botulism, and, >of course, those infants became seriously ill. So pediatricians now >advise strongly against using honey for children under a certain age.

Yes, raw honey can contain the temperature resistant spores of "Clostridium botulinum", the bacterium that causes botulism. The organism is a strict anaerobe, meaning that it only grows in the absence of molecular oxygen. The problem with infants and honey is that the small, intestinal tract of an infant apparently is sufficiently anaerobic to allow the spores to germinate into actively growing C.

botulinum organisms. Essentially, the infant serves the same role as a sealed, airtight, contaminated can of beans as far as the organisms are concerned. There in the infant's body the bacteria secrete the dangerous toxin that causes the symptoms of botulism. There have been quite a few documented infant deaths due to honey. As I recall, the studies identifying honey as the source were done in the '80s. Most pediatricians recommend no honey for the first year. It is probably best to check with your own for even later updates...Geri Guidetti, The Ark Institute

D.2.4 HONEY OUTGASSING

Q: My can of honey is bulging. Is it safe to use?

A: Honey can react with the can lining to release a gas especially when stored over a long period of time. Honey's high sugar content prevents bacteria growth. If there is no sign of mold growth, it is safe to eat. FREQUENTLY ASKED FOOD QUESTIONS, FN250

D.3 TYPES OF CANE SYRUPS.

MOLASSES & CANE SYRUP: These two sweeteners are not precisely the same thing. Molasses is a by-product of sugar refining and cane syrup is simply cane juice boiled down to a syrup, in much the same way as maple syrup is produced. Non-Southerners (U.S.) may know it better as unsulphured molasses even if this is not completely correct. Sulphured molasses is also available on the market and very cheap as well, but it's strong flavor is unattractive and generally not desirable.

SORGHUM: This is produced in the same manner as cane syrup, but sorghum cane, rather than sugar cane, is used. Sorghum tends to have a thinner, slightly sourer taste than cane syrup.

TREACLE: This sweetener comes in varying colors from a rather dark version, similar to, but not quite the same as blackstrap molasses, to paler versions more similar to golden syrup.

All of the above syrups are generally dark with a rich, heavy flavor.

GOLDEN SYRUP: This syrup seems to be both lighter and paler in color than any of the above three, probably more similar to what we would call a table syrup here in the U.S.

TABLE SYRUP: There are many table syrups sold in supermarkets, some with flavorings of one sort or another such as maple, various fruits, etc. A close examination of the ingredients list will reveal mixtures of cane syrup, cane sugar syrup or corn syrup along with preservatives, colorings and other additives. They usually have a much less pronounced flavor than molasses, cane syrup, sorghum or the darker treacles. Any syrup containing corn syrup should be stored as corn syrup.

D.3.1 STORING CANE SYRUPS

All of the above syrups, except for those having corn syrup in their makeup, have the same storage characteristics. They can be stored on the shelf for about two years and up to a year after opening. Once they are opened, they are best kept in the refrigerator to retard mold growth. If mold growth does occur, the syrup should be discarded. The outside of the bottle should be cleaned of drips after each use. Some pure cane and sorghum syrups may crystallize in storage, but this causes no harm and they can be reliquified using the same method as for honey.

D.4 CORN SYRUP

Corn syrup is a liquid sweetener made by an enzyme reaction with corn-starch. Available in both a light and a dark form, the darker variety has a flavor similar to molasses and contains refiners syrup (a byproduct of sugar refining). Both types often contain flavorings and preservatives. It is commonly used in baking and candy making because it does not crystallize when heated. Corn syrup is very common in the U.S., but less so in the rest of the world.

Corn syrup stores poorly compared to other sweeteners and because of this it often has a best if used by dating code on the bottle. It should be stored in its original bottle, tightly capped, in a cool, dry place. New unopened bottles keep about six months from the date on the label. After opening, keep the corn syrup four to six months. These syrups are very prone to mold and to fermentation so be on the lookout for bubbling or a mold haze. If these present themselves, throw the syrup out. You should always be certain to wipe off any drips from the bottle after every use.

D.5 MAPLE SYRUP

Maple syrup is produced by boiling down sap of the maple tree until it reaches a syrup consistency and is slightly sweeter than table sugar. Maple syrup is judged by much the same criteria as honey: Lightness of color, clarity and taste. Pure maple is generally expensive and most pancake syrups are corn and cane sugar syrups with either natural or artificial flavorings. Maple flavored pancake syrups should be kept and stored as corn syrups.

New unopened bottles of maple syrup may be kept on a cool, dark, shelf for up to two years. The sweetener may darken and the flavor get stronger, but it is still usable.

After the bottle has been opened, it should be refrigerated. It will last about a year. Be careful to look out for mold growth. If mold occurs, discard the syrup.

E. FATS AND OILS

All oils are fats, but not all fats are oils. They are very similar to each other in their chemical makeup, but what makes one an oil and another a fat is the percentage of hydrogen saturation in the fatty acids of which they are composed. The fats and oils which are available to us for culinary purposes are actually mixtures of differing fatty acids so for practical purposes we'll say saturated fats are solid at room temperature (70 deg. F) and unsaturated fats we call oils are liquid at room temperature. For dietary and nutrition purposes fats are generally classified as saturated, monosaturated and polyunsaturated, which is a further refinement of the amount of saturation of the particular compositions of fatty acids in the fats.

E.1 BUYING AND STORING OILS AND FATS

There is a problem with storing oils and fats for the long term and that is the fact that they go rancid rather quickly. Rancid fats have been implicated in increased rates of heart disease, atherosclerosis and are carcinogenic (cancer causing) so we want to avoid them if possible.

Oxygen is eight times more soluble in fat than in water and it is the oxidation resulting from this exposure that is the primary cause of rancidity. The more polyunsaturated a fat is, the faster it will go rancid. This may not, at first, be readily apparent because vegetable oils have to become several times more rancid than animal fats before our noses can detect it. An extreme example of rancidity is the linseed oil (flaxseed) that we use as a wood finish and a base for oil paints. In just a matter of hours the oil oxidizes into a solid polymer. This is very desirable for wood and paint, very undesirable for food.

Because of this difficulty in storing fats and oils for any long period of time many books and articles on the subject of food storage make only passing mention of them, if they say anything at all. This is unfortunate because fat contains nine calories to the gram compared to the four calories contained by either carbohydrates or protein. This makes fat a valuable source of concentrated calories that could be of real importance if faced with a diet consisting largely of unrefined grains and legumes. For small children, infants and the elderly, they may not be able to consume the volume of food that would be necessary in the course of a day to get all of the calories they would need to avoid weight loss and possible malnutrition. Additionally, fats play an important role in our perception of taste and texture and their absence would make many foods more difficult to prepare and consume.

Furthermore, a small amount of dietary fat is necessary for our bodies to properly absorb fat soluble vitamins like A,D,E and K.

Long term storage of fats may be problematical, but it is not impossible. There are some general rules you can follow to get the most life out of your stored cooking oils and fats.

#1 Exposure to oxygen, light and heat are the greatest factors to rancidity. If you can, refrigerate your stored oil, particularly after it's been opened. If possible, buy your oils in opaque, airtight containers. If you purchase it in plastic, particularly clear plastic, then transfer it to a gas impermeable glass or metal container that can be sealed airtight. If you have a means of doing so, vacuum sealing the storage container is an excellent idea as it removes most of the air remaining inside, taking much of the oxygen with it. Transparent glass and plastic containers should be stored in the dark, such as in a box. Regardless of the storage container, it should be stored at as cool a temperature as possible and rotated as fast as is practical. Oils and fats with preservatives added by the manufacturer will have a greater shelf life than those without them, provided they are fresh when purchased.

#2 Unless they have been specially treated, unopened cooking oils have a shelf life of about a year, depending upon the above conditions. Some specialty oils such as sesame and flax seed have shorter usable lives. If you don't use a great deal of it, try to not buy your fats in large containers. This way you won't be exposing a large quantity to the air after the you've opened it, to grow old and possibly rancid, before you can use it all up. Once opened, it is an excellent idea to refrigerate cooking fats. If it turns cloudy or solid, the fat is still perfectly usable and will return to its normal liquid, clear state after it has warmed to room temperature. Left at room temperatures, opened bottles of cooking oils can begin to rancid in anywhere from a week to a couple of months, though it may take several more months to reach such a point of rancidity that it can be smelled.

#3 Although darker colored oils have more flavor than paler colored, the agents that contribute to that flavor and color also contribute to faster rancidity. For maximum shelf life buy paler colored oils.

#4 If you have no particular problem with using it, the culinary fat with the most shelf life as it comes from the store is hydrogenated shortening in its unopened metal or metal lined can. The brand most familiar in the U.S. is probably Crisco, but there are many others. Solid shortening is usually composed of partially hydrogenated vegetable oils, but there are some that also contain animal fats. Some brands will also contain anti-oxidant preservatives as well. All other conditions being equal, those with preservatives will have a longer shelf life than those without. It is not possible to give an exact answer, but it is reasonable to expect an unopened metal can of shortening to have a shelf life of eight to ten years if kept reasonably cool, particularly if it has preservatives in it.

E.2 EXTENDING SHELF LIFE BY ADDING ANTI-OXIDANTS

If obtaining the maximum shelf life in your cooking oils is important to you, it is possible to add anti-oxidant preservatives to the fat after you have purchased it. Used in conjunction with a gas impermeable container, either opaque in color or stored in a dark place, and cool storage temperatures (70 F or less) then shelf life can be extended to about five years, possibly longer.

The anti-oxidant in question is Butylated HydroxyToluene (BHT). It is used in the food industry to slow the development of off-flavors, odors and color changes caused by oxidation, mostly in foods that are high in fats and oils. BHT is on the U.S. Food and Drug Administration's Generally Recognized As Safe (GRAS) list as a common preservative. The FDA limits the use of BHT to 0.02% or 200 parts per million (ppm) of the oil or fat content of a food product. The directions that I will be giving below will be for the FDA limit, but there are those who choose to use up to ten times that amount as part of their life extension programs. The level you choose is up to you.

BHT is available over the counter in the retail trade, but you have to know where to look for it. The only retail distributor of the anti-oxidant that I am thus far aware of is

Twin Laboratories (TwinLab),
Ronkonkoma, NY 11779.

Their BHT comes in the form of 250 mg gelatin capsules. I've been able to find their product in several local health food stores. It is also available through mail order sources, but I don't have any names or addresses for that avenue yet.

To get the best results you will need the freshest oil you can find. Purchasing it from a large, busy supermarket will probably suffice. You'll also need containers that are gas impermeable such as glass jars, or metal cans. There may be plastic containers with high gas barrier properties that will also serve, but I cannot knowledgeably say about this. It is important that your containers are food grade and are clean, dry and dust-free.

Each 250 milligram capsule is sufficient to treat 47 fluid ounces of cooking oil (as per the GRAS guidelines mentioned above). If you have an accurate means of weighing this works out to be 5.3 mg of BHT crystals to every 1 fl oz of oil. If you're using a scale calibrated in grains, such as a reloading powder scale, you may use the following table.

BHT in grains	OIL	BHT in milligrams
0.1 grain	1 fl oz	5.3 mg
0.7 grain	8 fl oz (1 cup)	42.4 mg

1.3 grain	16 fl oz (1 pint)	84.8 mg
2.6 grain	32 fl oz (1 quart)	169.6 mg
5.2 grain	64 fl oz (1/2 gal)	339.2 mg
10.3 grain	128 fl oz (1 gal)	678.4 mg

NOTE: The grain weight measurements have been rounded up to the nearest tenth grain since most powder scales will not accurately measure less than one-tenth of a grain.

IMPORTANT NOTE: If you are using a reloading powder scale, be sure the balance pan is clean and the balance has been calibrated recently with a reliable set of check weights.

Remove the BHT crystals from their gelatin capsules and weigh, if you're going to. Once you have the appropriate amount, add the crystals to a pint or so of the oil, shaking vigorously. It may take several hours for the preservative to dissolve completely. Bringing the oil up to a warm, NOT HOT, temperature will speed the process. Once completely dissolved, pour the anti-oxidant laden oil into the rest of the oil and mix thoroughly. Once mixed, the oil can then be poured into its storage containers leaving approximately 1/2 inch of headspace. If you have a vacuum sealer the jars or cans may be vacuum sealed to remove most of the oxygen from the container, otherwise just seal the lid. Store in a cool place and if using transparent jars, be certain to put them in a larger container such as a box to keep the contents in the dark. Don't forget to label and date the jars.

There are other preservatives in food industry use that will also work, but I have not yet discovered how they are used or where to get them. I'm currently looking for information on Butylated HydroxyAnisole (BHA), propyl gallate, vitamin E (the tocopherols, natural and synthetic), ascorbyl palmitate (a fat soluble form of vitamin C), citric acid and mono-Tertiary-ButylHydroQuinone (TBHQ). Additionally, certain herbs and spices like cloves, rosemary, oregano, sage and vanilla also have antioxidant properties, sometimes quite strong ones. Being strongly flavored, they are not suitable as preservatives in fats meant for general use, but will lend their protective properties in any recipes that call for them.

Before I close out this section on fats and oils, please allow me to reemphasize that no amount of preservatives that can be added to your stored fats will substitute for proper storage and rotation. The more I research the chemistry and physiological effects of rancid fats the more I come to believe they are bad news for long term health, particularly as we grow older. Don't sit on your oil supply for years without rotating it. Just a little bit rancid is just a little bit poisonous. `Nuff said.

F. COOKING STAPLES

F.1 BAKING POWDER.

This powder is a combination of an acid and an alkali with starch

added to keep the other two ingredients stable and dry. The powder reacts with liquid by foaming and the resulting bubbles can aerate and raise dough. Almost all baking powder now on the market is double acting, meaning it has one acid that bubbles at room temperature and another acid which only reacts at oven temperatures. Unless a recipe specifies otherwise, this is the type to use.

Don't expose baking powder to steam, humid air, wet spoons, or any other moisture. Store in a tightly lidded container for no more than a year. Even when kept bone dry it will eventually loses its potency. To test its strength, measure 1 tsp powder into 1/3 cup hot water. The mixture should fizz and bubble furiously. If it doesn't, throw it out.

For those folks concerned with aluminum in the diet, the Rumford brand has none in it and there may be others.

F.2 BAKING SODA.

This gritty powder is sodium bicarbonate also called sodium acid bicarbonate ($NaHCO_3$), a mild alkali. It is used in baking to leaven bread and other baked or fried foods and does so in the same manner as baking powder. It can also be used to make hominy. When combined with an acid ingredient, the bicarbonate reacts to give off carbon dioxide bubbles which causes the baked good to rise. If kept well sealed in an air- and moisture-proof container its storage life is indefinite. If kept in the cardboard box it usually comes in, it will keep for about eighteen months. Do keep in mind that baking soda is a wonderful odor adsorber. If you don't want your baked goods tasting of whatever smells it adsorbed then keeping it in an airtight container is an excellent idea.

F.3 HERBS AND SPICES.

It is difficult to give exact instructions on how best to store culinary herbs and spices because there are dozens of different seeds, leaves, roots, barks, etc., we call an herb or a spice. There are, however, some general rules to be followed to best preserve their flavors. All spices, particularly dried, are especially sensitive to heat, air and light. Room temperature is satisfactory for keeping them and refrigeration or freezing is even better, but they should be kept away from heat sources. It is common for the household spice cabinet or shelf to be located over the stove, but this is really a very poor place. Dark opaque glass is best for storage, but failing that, keeping a tightly sealed glass container in a dark place is next best. The cellophane packets some products come in just won't do. Tightly sealed metal containers will work as well. Even dense plastic will do, but glass is best.

Where possible, buy spices whole. Whole nutmegs will keep their flavor far longer than ground nutmeg, the same for other seeds and roots. You'll have to use a grater, grinder or whatever, but the difference in flavor will be worth it.

If you buy spices in bulk containers (which is certainly cheaper) consider transferring some into smaller containers and keeping the larger one tightly sealed in a cool, dark place. This will prevent unwanted light and air from continually getting in and playing havoc.

Included in the suppliers addresses are listings for several spice and herb companies. The one I have personally dealt with so far is Penzey's and their products have been consistently excellent with good prices. It's worth investigating some of these companies as they can really take the sting out of purchasing large quantities.

F.4 SALT.

Storage life for salt is indefinite. So long as you do not let it get contaminated with dirt or whatever, it will never go bad. Over time, iodized salt may turn yellow, but this is harmless and may still be used. Salt is rather hygroscopic and will adsorb moisture from the air if not sealed in an air-tight container. If it does adsorb moisture and cakes up, it can be dried in the oven and then broken up with no harm done.

All salt, however, is not the same. Salt comes in a number of different varieties, and very little of what is produced in the U.S. is intended for use in food. The rest of it, about 98%, has other uses. Therefore, it is important to be certain the salt you have is intended for human consumption. Once you are satisfied it is, you should then determine its appropriateness for the tasks to which you might want to set it to. Below is a partial list of some of the available salts

TABLE SALT: This is by far the most widely known type of salt. It comes in two varieties; iodized and non-iodized. There is an ingredient added to it to adsorb moisture so it will stay free flowing in damp weather. This non-caking agent does not dissolve in water and can cause cloudiness in whatever solution it is used if sufficiently large quantities are used. In canning it won't cause a problem since there is very little per jar. For pickling, though, it would be noticeable. If you are storing salt for this purpose, you should be sure to choose plain pickling salt, or other food grade pure salt such as kosher salt. In the iodized varieties, the iodine can cause discoloration or darkening of pickled foods so be certain not to use it for that purpose. For folks who come from areas that are historically iodine deficient a store of iodized salt for table consumption is of real importance.

CANNING SALT: This is pure salt and nothing but salt. It can usually be found in the canning supplies section of most stores. This is the salt to be preferred for most food preservation or storage uses. It is generally about the same grain size as table salt.

KOSHER SALT: This salt is not really, in itself, kosher, but is used in "kashering" meat to make the flesh kosher for eating. This involves first soaking the meat then rubbing it with the salt to draw out the blood which is not-kosher and is subsequently washed off along with the salt. The cleansed meat is then kosher. What makes it of interest for food storage and preservation is that it is generally pure salt suitable for canning, pickling and meat curing. It is of a larger grain size than table or canning salt, and usually rolled to make the grains flaked for easier dissolving. Frequently it is slightly cheaper than canning salt and usually easier to find in urban/suburban areas.

NOTE: Not all brands of kosher salt are exactly alike. Diamond Crystal Kosher Salt is the only brand that I'm aware of that is not flaked, but still in its unaltered crystal form. The Morton brand of Coarse Kosher Salt has "yellow prussiate of soda" added as an anti-caking agent. Morton still recommends it for pickling and even gives a kosher dill recipe on the box so I presume that this particular anti-caking agent does not cause cloudiness in pickling solutions.

Whether flaked or in its unaltered crystal form, kosher salt takes up more volume for an equivalent amount of mass than does canning salt. If it is important to get a very precise amount of salt in your pickling or curing recipe you may want to weigh the salt to get the correct amount.

SEA SALT: This type of salt comes in about as many different varieties as coffee and from about as many different places around the world. The "gourmet" versions can be rather expensive. In general, the types sold in grocery stores, natural food markets and gourmet shops have been purified enough to use in food. It's not suitable for food preservation, though, because the mineral content it contains (other than the sodium chloride) may cause discoloration of the food.

ROCK or ICE CREAM SALT: This type of salt comes in large chunky crystals and is intended primarily for use in home ice cream churns to lower the temperature of the ice filled water in which the churn sits. It's also sometimes used in icing down beer kegs or watermelons. It is used in food preservation by some, but none of the brands I have been able to find label it as food grade nor do they specifically mention its use in foods so I would not use it for this purpose.

SOLAR SALT: This is also sometimes confusingly called "sea salt". It is not, however, the same thing as the sea salt found in food stores. Most importantly, it is not food grade. It's main purpose is for use in water softeners. The reason it is called "solar" and sometimes "sea salt" is that it is produced by evaporation of sea water in large ponds in various arid areas of the world. This salt type is not purified and still contains the desiccated remains of whatever

aquatic life might have been trapped in it. Those organic remains might react with the proteins in the foods you are attempting to preserve and cause it to spoil.

HALITE: For those of us fortunate enough to live in areas warm enough not need it, halite is the salt that is used on roads to melt snow and ice. It, too, is not food grade and should not be used in food preservation. This form of salt is also frequently called rock salt, like the rock salt above, but neither are suitable for food use.

SALT SUBSTITUTES: These are various other kinds of metal salts such as potassium chloride used to substitute for the ordinary sodium chloride (NaCl) salt we are familiar with. They have their uses, but should not be used in foods undergoing a heated preservation processing, as they can cause the product to taste bad. Even the heat from normal cooking is sometimes sufficient to cause this.

F.5 VINEGAR.

There is vinegar and then there is vinegar and it is not all alike. The active ingredient in all vinegars is acetic acid, but how the sour stuff was made can vary widely. The most common vinegar is white distilled which is actually just diluted distilled acetic acid and not true vinegar at all. It keeps pretty much indefinitely if tightly sealed in a plastic or glass bottle with a plastic cap. The enamel coated metal caps always seem to get eaten by the acid over time. It is usually about 5-6% acetic acid and for pickling it is the type most often called for.

The next most common variety is apple cider vinegar. There are two kinds of this type. A cider flavored distilled acetic acid type and a true cider vinegar fermented from hard cider. Either will store indefinitely at room temperature until a sediment begins to appear on the bottom. Stored vinegar will sometimes develop a cloudy substance. This is called a mother of vinegar and it is harmless. As long as the liquid does not begin to smell foul it can be filtered out through cheesecloth or a coffee filter and rebottled in a clean container. The mother can even be used to make more vinegar. If it begins to smell bad, however, it's gone over and should be tossed out.

The more exotic wine, balsalmic and other vinegars can be stored like cider vinegar. Age and exposure to light and air, however, eventually begin to take their toll on their delicate flavors. Tightly capped in a cool, dark cabinet or refrigerator is best for their storage.

F.6 YEAST.

Yeast is just not a product you can stow away and forget about

until you need it next year. It is, after all, a living organism and if it's not alive at the time you need it, you won't get any use out of it. This ancient leavening, brewing, fermenting agent is a single celled microscopic fungus. When we incorporate it into our bread dough, beer wort or fruit juice it begins to reproduce madly (we hope) and produce several by-products. If you're baking, the by-product you want is carbon dioxide which is trapped by the dough and subsequently causes it to rise. In brewing or vintning what is wanted is the ethyl alcohol and, if the drink is to be carbonated, the carbon dioxide as well.

Almost all yeasts used for these purposes are in the same genus ("Saccharomyces" or sugar fungi), but several different species have evolved and some are more suitable for a particular task than others. It's entirely possible to use grocery store bread yeast to brew beer or ferment wine, but the results may leave a great deal to be desired. It's also possible to use yeast from beer brewing to make bread and from what I've read the results were pretty much indistinguishable from bread yeast.

Leaving aside the brewing and vintning yeasts which are really outside the scope of this FAQ I am going to concentrate on bread yeast. It comes in two generally available forms; compressed or fresh and dried, sometimes called granular or instant active dry yeast. They are different genetic strains of the same species, and have different characteristics.

Compressed yeast is only partly dried (about 70% moisture) and requires refrigeration and keeps even better in the deep freeze. If kept in an air- and moisture-tight container to prevent it from desiccating this type of yeast will keep for a year in the freezer (0 deg. F or less), but only about two weeks (maybe a bit more) in the refrigerator. Unless your kitchen is rather chilly it will not keep on the shelf. It should not have a mottled color or a sour odor.

Dried yeast has only an 8% moisture content and comes packed in foil envelopes. The smaller single use packets are not generally vacuum packed, but the larger commercial sized "bricks" of about a pound or two each generally are. They can last for months on the shelf, until the expiration date which should be clearly stamped on the package. If packaged in the same manner as recommended for compressed yeast above and kept in the refrigerator or freezer it can last for several years. The larger packs of yeast should be transferred to an air and moisture tight container after opening.

Either type of yeast can be tested for viability by proofing it. This is nothing more than mixing a small amount of the yeast with an equal amount of sugar in warm water (105-115 deg. F for dried; 95 deg. F for fresh). Within about five minutes active yeast will become bubbly and begin to expand (at normal room temperature). Yeast which only slowly becomes active can still be used, but you will have to use more of it. If it shows no activity at all, it's dead and should be thrown out.

There is another means of providing yeast for baking besides buying

it from the grocery store and that is by using a sourdough starter. I'm not going to address it here, but I will point out that it has a newsgroup all its own (rec.food.sourdough) and several FAQ's devoted to it. You can find addresses for these FAQs in the Resources section. Drop in and read for awhile and you'll learn more than you thought you could ever want to know.

G. INFANT FORMULA

Since most folks interested in food storage are planning for families, real or as yet hypothetical, I thought it important to include something on infant formula. Most baby food that comes in jars can be treated like canned goods of similar types meant for adults. Formula, though, is something else. I have to admit, that not yet having kids of my own, I've not given this much thought before so the below is taken from the book KEEPING FOOD FRESH, by Janet Bailey (see book list). In the future, if some of you readers will send it to me and/or I come up with more information from my own researches I want to expand this section on infant/child food storage.

Prepared infant formula is primarily water and nonfat cow's milk. Among other ingredients, it contains sweeteners; sometimes lactose which is milk sugar; and sometimes corn syrup or other sugars. Coconut and soybean oils are common; vitamin and mineral supplements are universal. A few brands contain mono- and diglycerides, chemicals that keep the liquid from separating.

BUYING AND STORING INFANT FORMULA. Canned liquid infant formula comes either ready to eat or in a concentrate to be diluted with water. Cans and packing cases are clearly marked with a "use by" date.

Unopened cans stored in a cool, dry place keep well from twelve to eighteen months (longer than the baby is an infant).

After the can is opened, measure out the amount of formula you need, cover the can and store in the refrigerator. It will keep no more than 48 hrs at 40 deg. F. Never return leftover formula from the bottle to the storage container and do not store half used bottles.

You can pre-measure the whole can-full into sterilized baby bottles, seal them, and store them in the refrigerator, but forty eight hours is still the limit. To keep full bottles from tipping over in the refrigerator, slip them into a carton from a six-pack of soda pop bottles.

In examining the offerings at my local grocer I see that infant formula is also offered as a dry powder to be mixed by the parent. I could not come to a ready idea of how long the formula powder might be good on the shelf since it seemed to vary radically depending on exact type and manufacturer. The shortest use-by date was only a year, but

some had use-by dates three years into the future. Clearly, this is an area that is going to need much investigation. I hope some of our knowledgeable readers out there will be able to help out.

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-- III --
SPOILAGE

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A -- INSECT INFESTATIONS

A.1 PESTS OF STORED GRAINS, LEGUMES AND DRY FOODSTUFFS

Insect infestations can occur in a wide variety of foodstuffs such as flours, meals, pastas, dried fruits and vegetables, nuts, sweets, whole grains, beans, sugars, TVP, jerky, bird seed and pet foods.

Naturally, the best way to deal with an insect infestation is not to have one in the first place. Try to purchase from suppliers who are clean and have a high volume of turnover of their products. This will mean the products you purchase will be less likely to have bugs in them.

When you buy foodstuffs examine them closely to be sure they are insect free. Check for any packaging or use by dates to insure their freshness. Don't shake the package, most adult insects will be found in the top couple of inches of the product and shaking the package will mix them into the contents and disguise them. If the package does turn out to be infested, return it for replacement.

Once you have purchased the product you should store it in an air- and moisture-tight container so it cannot be invaded after you have brought it home. With sufficient time, adult and some larval insect forms can penetrate paper, cardboard and thin plastic packaging. Your containers should be either heavy plastic, glass or metal with tight fitting lids. As with everything in food storage, you should use older packages before newer ones and opened packages before unopened ones.

The storage area should be kept clean. Don't allow grain, flour, beans, bits of pasta or other food particles to accumulate on shelves or the floor. Cracks and crevices should be sealed or otherwise blocked. Unless it is a sticky spill, vacuuming is the best method of cleaning since cleaning with soap and water can wash food particles into the cracks.

Insects may get their start in chairs, sofas and carpets where food is dropped and not cleaned up. Don't forget to replace the filter bag on the vacuum since some insects can survive and reproduce in the bag after they've been sucked into it.

Bags of dry pet food and bird seed can also harbor insect infestation. Decorative foodstuffs such as ears of colorful Indian corn, colored beans and hard squashes can carry insects that can infest your edible food. Even poison baits can harbor flour beetles.

A.2 CONTROL OF INSECT INFESTATIONS

Should you find that in spite of buying fresh products and using careful packaging techniques you have an insect infestation, you can try some of the following steps:

1. If the food is too heavily infested to try to save it should be disposed of as soon as possible. Remove it from the kitchen or food storage area immediately so it won't infest other foods.

2. Large bugs can be sifted or winnowed out if the food's not too heavily infested and you want to try to save it. Then treat it by placing into a deep freezer at 0 deg. F for three to seven days depending upon the size of the package. Refrigerator freezers usually do not freeze low enough to effectively kill all of the life stages of insects, but if left there, will slow their development. If freezing is not workable then the product could be spread on baking sheets and heated to 150 deg. F for fifteen to twenty minutes, cooled and repackaged. Heat treated foods should be consumed shortly thereafter.

3. The surface areas where the food containers are stored can be treated with an insecticide. This is not a replacement for clean storage habits and good containers, but it can supplement it. This will not control insect infestations already in your stored foods.

Spray the shelf surface with 0.5% chlorpyrifos (Dursban), 1% propoxur (Baygon), 0.5 percent diazinon, or 0.25 percent resmethrin. You can find any of these in the hardware store in ready to apply packages. If a sprayer isn't feasible then they can be applied with a paint brush. Allow the solution to dry thoroughly. Cover the shelves with clean, untreated shelf paper and put properly packaged foods back on shelves. READ THE PRODUCT LABEL FOR SAFETY INFORMATION CONCERNING CHILDREN AND PETS.

Household bleach, Lysol and other sterilizers will not control insect infestation, though they can be used for mold, mildew and algae.

You may continue to find some insects after the cleanup is finished. This could be for several reasons. The first being they escaped from the packages they were infesting and did not get cleaned up. There may be more packages infested than were originally realized or, there may be hiding places in the storage area that need attention. Once you have carefully eliminated all food sources, the bugs should disappear in three to four weeks.

B -- MOLDS IN FOOD

Molds are fungi just like mushrooms and yeast. Also like mushrooms, they reproduce by releasing spores into the air that land on everything, including your food and food storage containers. If those spores begin to grow, they create thin threads that spread through out

their growing medium. These threads are the roots of the mold fungus, called "mycelium". The stalk of a mold fungus is the portion above or on the surface of the food. It produces the spores and gives the mold its color. We've all seen examples of this when we discover a dish of something or other left way-y-y too long in the refrigerator and has become covered in mold fuzz.

Molds can grow anywhere they have a growing medium (their food), sufficient moisture and enough warmth. Some can even grow at refrigerator temperatures, albeit more slowly than they would if it were warmer. They can also withstand much more salt and sugar than bacteria, which is why you sometimes find mold in jellies and jams with their high sugar content and on cured products like ham or bacon with their high salt content.

In the past, it was often felt a slight amount of mold was harmless and the food could be consumed anyway. For molds that were intentionally introduced into the food, such as the mold in bleu cheese, this is just fine. For the unintentional molds, it can be a very serious error in judgment. These unwanted molds might just be producing a toxic substance called a "mycotoxin" which can be very bad indeed. Mycotoxins are produced around the root or mycelium of the mold and the mold roots can penetrate very deeply into the food. These mycotoxins can survive for a long time in foods, and unfortunately most are not destroyed by cooking. The molds probably best known for this are the various Aspergillus varieties which produces a mycotoxin known as "aflatoxin", but there are other dangerous molds as well, such as the Fusarium molds. Both of the above affect grain and some legumes. See B.3 Molds In Grains and Legumes.

IMPORTANT NOTE: In wet pack foods such as your home canned goodies, molds can do something else as well, possibly leading to lethal consequences. If they find their way into wet pack acid foods canned by the boiling water bath method, whether by reasons of improper procedure or contamination after the fact, they can consume the natural acids present in the food. The effect of this is to raise the pH of the food in the container, perhaps to the point that it becomes possible for spores of *Clostridium botulinum*, better known as "botulism", to become active and reproduce. If you're not already aware of the consequences of botulism poisoning, please read the bacterial spoilage section below where it has an entry all its own. This is the most deadly kind of food poisoning there is. For this reason, moldy wet pack foods should be *safely* discarded.

Molds in low acid foods canned by the pressure canning method are equally dangerous and should also be discarded in a safe manner.

B.1 MINIMIZING MOLDS

You can do a number of things to minimize unwanted mold growth in your kitchen, food storage areas and refrigerators. If your kitchen is at all like mine, it is the refrigerator that is going to collect the most fungal growth. This can be dealt with by washing the inside every

couple of months with a tablespoon of baking soda dissolved in a quart of warm water. Rinse clean and allow to dry. The black mildew that grows on the rubber door gaskets and other places can be dealt with by wiping down with a solution of three tablespoons of household bleach in a quart of water. I generally use a soft bristle brush for this.

The rest of the kitchen can be kept mold free by keeping it clean, and dry and by spraying occasionally with a product such as Lysol. Patches of mold growing in spots can be eliminated with the bleach solution used on the refrigerator doors.

Try not to purchase more fresh food than you'll be able to eat in a short period of time. This will keep you from having to deal with the moldy remains that didn't get eaten. If food does go moldy, don't sniff it. This is a good way to give yourself respiratory difficulties if you are at all susceptible to mold allergies. Moldy food should be disposed in such a manner that your animals and children won't be able to get into it. Mycotoxins are every bit as bad for your animals as they are for you.

Obviously, you don't have to throw out everything that shows a spot of mold on it. Some foods can be safely dealt with and still partially saved if they show signs of fungal growth. Below is a set of guideline from M. Susan Brewer, Ph.D., R.D., a specialist in food safety. Her articles and works are found in many state university extension services publications lists.

If the food shows even a tiny mold spot, follow these guide lines:

1. Hard or firm foods with tiny mold spots can be trimmed; cut away the area around the mold (at least an inch) and rewrap in clean wrap. Make sure that knife does not touch the mold.

2. Soft foods such as cheese slices, cream cheese, sour cream and yogurt should be thrown away.

TOSS:

Soft Cheeses, (Mozzarella, Brie, etc.)
Sour Cream, Yogurt, Cottage cheese
Bacon, Hot dogs, Sliced lunch meats
Meat pies
Opened canned ham
Most left-over food
Bread, Cakes, rolls, flour, pastry
Peanut butter
Juices, berries
Jam, Jellies, Syrups
Cucumbers, Tomatoes
Spinach, Lettuce, other leafy vegetables
Bananas, Peaches, Melons
Corn-on-the-cob

Stored nuts, whole grains, rice

TRIM:
Hard Cheese (Cheddar, Swiss, etc.)
Bell Peppers, Carrots, Cabbage
Broccoli, Cauliflower, Brussels Sprouts
Garlic, Onions
Potatoes, Turnips
Zucchini
Apples, Pears

B.2 MOLDS IN CANNED GOODS

If good equipment and proper technique are used, then it is unlikely you will ever have mold growth in your unopened canned goods. If you do have such, then there was either a flaw in the procedure you used, or something affected the jar or can after the fact to break its seal. In any event, once the food has molded, it is past saving and should be discarded in such a way that children and animals will not be able to get into it. The most likely home canned products to show mold growth are jams and jellies sealed with paraffin wax.

There are a number of points in the canning process where this can occur:

(1) In the time after the jar is taken out of its boiling water bath, but before it is filled.

(2) In the time between when the jar is filled and covered with the melted wax.

(3) When the wax cools, if it pulls away from the side of the jar, leaving an opening for the mold to get in.

(4) If bubbles form in the paraffin, which break and leave holes.

It is for this reason that most canning authorities no longer recommend using this technique. If you must use it, the jelly jars should be boiled for at least 10 minutes before the jelly is poured into the jars. The filled and wax capped jars should then be covered with some sort of protective lid. The book, Putting Food By has excellent instructions on this or see the applicable section of the rec.food.preserving FAQ by Leslie Basel.

B.3 MOLDS IN GRAINS AND LEGUMES

It's long been known that eating moldy grain is bad for your health. The ugly consequences of eating ergot-infected rye probably make the best known example. It's only been for about thirty years, though, that intensive study of these grain fungi have been carried out on other varieties of molds and their respective mycotoxins.

Fortunately, for those of us in the U.S., the USDA and the various state departments of agriculture go to a great deal of trouble to detect grain and legumes infected with these toxic fungi. In some of the less developed countries, the citizenry are not so lucky. Still, it is good to have something of an understanding of what one should do to prevent mold growth in one`s stored grains and to have an idea of what to look for and ask about when purchasing grains and legumes.

The one fungal type that has caused the most commotion in recent history are the various "Aspergillus" species of molds. Under certain conditions with certain grains, legumes, and to a lesser extent, nuts, they can produce a mycotoxin called "aflatoxin". This is a serious problem in some parts of the world, most especially in peanuts, occasionally in corn. I am not aware of any documented deaths in the United States from aflatoxicity, but other nations have not been so fortunate. What makes aflatoxin so worrisome in this country is that it is also a very potent carcinogen (cancer causing agent).

In addition to the Aspergillus molds, there is also a very large family of molds called "Fusarium" and these can produce a wide variety of mycotoxins, all of which you do not want to be eating directly or feeding to your food animals where you will get the toxins back indirectly when you eat them.

The Federal government and the various state governments continuously monitor food and forage crops. Those products which are prone to mold growth and toxin production are not allowed to be sold for food. Once purchased however, it is up to you to keep your food safe from mold growth. If you have already found mold growth in your whole grains, meals, flours or other grain products, they should be discarded. Most mycotoxins are not broken down or destroyed by cooking temperatures and there is no safe way to salvage grain that has molded.

B.3.1 PREVENTING MOLD GROWTH IN STORED GRAINS AND LEGUMES

The easiest method to prevent mold growth in your stored grains and legumes is simply to keep them too dry for the mold to grow. The Aspergillus and Fusarium molds require moisture contents of 18% and above to reproduce. This is subject to some variability, but in all grains and soybeans, they must have a moisture content of that level. If you are storing raw (not roasted) peanuts, in the shell or shelled, you want to get the moisture content to less than 8% as peanuts are particularly susceptible to mold growth. The recommended moisture content for all other grain and legume storage is no more than 10%. *Please see part 2.A.3.1 Grains and Legumes for a method to determine moisture content.* At 10% moisture, it is simply too dry for fungi to grow. *Please see 1.A.4 Storing Grains and Legumes for a suitable packaging technique.*

C -- BACTERIAL SPOILAGE

Just like the fungi, bacteria are everywhere. They're in the

water, soil, air, on you, your food and your food storage containers. Fortunately, the vast majority of the bacteria we encounter are relatively harmless or even benign and only a few represent a danger to us and our stored foods.

Bacteria can be very much more difficult to kill off than molds and insects. Some of them are capable of continued growth at temperatures that would kill other spoilage organisms. When conditions are such that they are unable to grow, some bacteria can go dormant and form spores. These spores can be quite hardy, even to the point of surviving a rolling boil.

In order to grow, bacteria need moisture, some as little as a 20% moisture content. For dry grains, legumes, powdered milk and other low moisture foodstuff bacterial spoilage will seldom be a problem so long as the moisture level in the foodstuff remains too scant to support its growth. For this reason, it is imperative that such products be drier than 20% and preferably below 10% to ward off mold growth as well. The botulism bacterium needs moisture in the 35% range to grow. Thus, making being sure of the moisture content of the food products you want to store, and appropriately using desiccants in your food packaging are also excellent ideas.

WARNING: It is in wet pack canned goods (where the container has free liquid in it) and fresh foods we must be the most concerned about spoilage bacteria. It is here that a little bad luck and a moment's inattention to what you are doing could kill or seriously injure you or some other person who eats the foods you've put by. In both home-canned and commercially-canned goods, IF THE CAN IS BULGING, LEAKING, SMELLS BAD, OR SPEWS LIQUID WHEN YOU OPEN IT THEN THROW IT OUT!
But, throw it out safely so that children and animals cannot get into it.

C.1 BOTULISM

Clostridium botulinum is one of the oldest life forms found on the planet. Like the gangrene bacteria, it is an anaerobic organism meaning it lives and grows in the absence of free oxygen. It forms spores when conditions are not suitable for it to grow and it is commonly found in the soil. This means it can be brought into your life on raw produce, tools, hands or anything else that came into contact with dirt. To further complicate matters, botulinum spores are extremely heat-hardy. The bacteria itself can be killed by exposing them for a short time to boiling water (212 deg. F AT SEA LEVEL PRESSURE), but their spores can not. To kill them, the food product and container must be exposed to temperatures of 240 deg. F (AGAIN AT SEA LEVEL PRESSURE) for a long enough period of time to allow all of the food in each container to come completely up to the proper temperature. Only a pressure- canner can reach the necessary temperature.

It's not the bacteria or its spores which are directly deadly, but the toxin the bacteria creates when it grows and reproduces. In its

pure form, botulism toxin is so potent that a mere teaspoon of it would be enough to provide a fatal dose to hundreds of thousands of people. It is this lethality that is why every responsible book on canning, food preservation, food storage, and the like hammers constantly on the need for care in technique and method and why spoilage must be taken so seriously.

C. botulinum, like any other life form, must have suitable conditions for it to grow and become a danger to you. One of the conditions it must have is a suitable pH range in its environment. pH is the measure of the acidity or alkalinity of a substance and is measured on a scale of 1-14 with anything above 7 being considered alkaline and everything below 7 being considered acid. If the pH of your wet pack food is BELOW 4.6 then botulism is unable to grow. Keep in mind pH is not eternal in foods and it is possible for it to change. If it should change to a lesser acidity than 4.6 pH your previously botulinum proof food may start allowing the lethal spoiler to grow (see B.2, molds in canned goods). This is why it is vital to use proper technique, even for acid foods like tomatoes. It has been found that when this occurs and botulinum becomes active and produces its lethal toxin it also produces minute amounts of acid which can lower the pH of the poisoned food back into what should have been the safe zone had the pH not jumped up and allowed the bacteria to grow. Again and again -- use good technique and pay attention to what you are doing.

Botulinum toxin, unlike fungal mycotoxins, can be destroyed by boiling the food briskly in an open vessel for fifteen minutes. Because of this, if your canned food shows any safety problems you should follow this procedure. If the food shows even the slightest mold growth, keep in mind that mycotoxins are not for the most part broken down by heat and dispose of the food safely.

I don't intend to go into the hows of home canning here. For that I strongly recommend that you read the *r.f.p. FAQ*, the *Ball Blue Book* and most especially the book *Putting Food By* for in depth information on this subject.

C.2 OTHER BACTERIAL SPOILERS OF FOOD

This section will be in a future version of this FAQ.

D -- ENZYMATIC ACTION IN FOOD SPOILAGE

Every living organism uses enzymes of many sorts in its bodily functions as part of its normal life cycle. Enzymes are used in creating life. After death, enzymes play a role in the decomposition of once living tissue. The enzymes in a tomato help it to ripen and enzymes produced by the tomato and whatever fungal and bacterial spoilers are on it cause it to decay.

Fortunately, slowing down or stopping the action of a food's

enzymes is much easier to do than slowing or stopping some of the bacterial spoilers mentioned above. Enzymes are most active in a temperature range between 85-120 deg. F and begin to be destroyed when the temperature goes above 140 deg.F. Cold also slows down the action of enzymes, which is why fresh tomatoes last longer in the refrigerator than they do on the kitchen table. Most enzymatic action also requires moisture to occur. In foods stored at 10% moisture or less, there is not enough moisture for most enzymes to be active.

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-- IV --

SPECIFIC EQUIPMENT QUESTIONS

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A -- STORAGE CONTAINERS

A.1 WHAT IS FOOD GRADE PACKAGING?

Q: OK, I'm ready to start my storage program. What should I put the food in?

A: You should use food grade packaging for storing anything you intend to eat. A food grade container is one that will not transfer noxious or toxic substances into the food it is holding. If you are uncertain whether a package type is food grade you can contact the manufacturer. Ask if that particular container is (US) FDA approved meaning that it is safe for food use. When inquiring be sure to specify the characteristics of the food you are storing; wet, dry, strongly acidic or alkaline, alcoholic or a high fat content. A container that is approved for one of the above types of food may not be approved for another.

The major functions of a food storage container are to:

#1. Protect its contents from outside environmental influences such as moisture, and oxygen, but possibly also heat or cold, light, insects and/or rodents as well.

#2. Prevent damage during handling and shipping.

#3. Establish and/or maintain microbiological stability. The container should not allow microorganisms such as fungi and bacteria from outside the container to come into contact with its contents. This is of critical importance to wet-pack foods such as canned vegetables, fruits and meats.

#4. Withstand the temperatures and pressures it will be exposed to. This is necessary if the contents are to be pasteurized or sterilized, either immediately before or after filling. It must not have any structural failures nor release any noxious or toxic breakdown chemicals into the food it contains. This is the reason why purpose built canning jars are recommended for home canning and mayonnaise jars aren't. The former are made heavier to withstand

high temperatures and handling whereas the latter are not and have an increased risk of breakage if used for that purpose.

Virtually all containers used in home food preservation involving exposure to high temperatures are made of glass or metal, with the exception of some specialized "heat & seal" type of plastic bags. Glass can be used with any food type providing it is clean and in sound condition, but metal cans are more specialized. They must be intended for food use and must also have a lining or coating of the inside that is suitable for the pH level of the food it will be in contact with.

If the foods are not subjected to some form of heat processing just before or after packaging your selection of container types for home use is a great deal larger. Virtually any kind of clean, sound glass jar can be used and many types of new metal containers. Several sorts of plastics have become popular. These various kinds of plastics are each suited for different purposes, making selection a more complex task.

A.1.1 WHERE DO I FIND FOOD GRADE CONTAINERS?

Food grade packaging is everywhere. Every time you go into the grocery store you are surrounded by it. Many well known companies such as Tupperware and Rubbermaid manufacture and sell empty packaging for the express purpose of containing repackaged foods. The kinds of containers you are interested in and the types of foods you want to put in those containers will dictate where you need to look for a particular packaging system.

For food storage purposes most folks are usually interested in five and six gallon plastic pails, glass jars from pint to gallon sizes, metal containers such as the institutional sized #10 cans, and Mylar or other high barrier property plastic bags. Those are the containers most often used, but virtually anything that can protect foods from outside environmental influences, safely contain something you're going to later eat and have a volume capacity large enough to be worthwhile may be used.

A number of food storage retailers such as those listed in the Resources section sell plastic buckets, Mylar bags and a few even sell new #10 cans with lids. It may also be possible to purchase #10 cans through the LDS Family Canneries and dealers such as Lehman's Hardware Cumberland General Store or Home Canning Specialty and Supply. On the local scene, plastic five gallon buckets are widely available, but only if you purchase them through a restaurant or commercial foods supply house will you likely be able to tell if they're safe to keep food in. If you can locate a customer service number for the manufacturer you can call them and ask. Many times manufacturers will make products that are FDA approved and sell them as general purpose containers, but you need to call to be sure.

Packaging supply houses, such as United States Plastics and others, have large FDA approved packaging lines. Several such companies are listed in the Resources section and a bit of detective work can probably

turn up more. Some require minimum orders and others don't. The cost of shipping the containers will probably play a major role in your decision making. If you are going to package a great deal of food all at once, perhaps for a group of people, some of the companies that require minimum purchases can sometimes save you a fair amount of money and supply packaging you might otherwise have a difficult time finding. Some time spent searching the Thomas Register, available both online (http://www12.thomasregister.com) and in library reference sections, might turn up some valuable leads.

For glass jars, don't overlook flea markets, yard sales, thrift shops and similar places. Canning jars can sometimes be had for very little. Delicatessens, sub shops and restaurants of all sorts can be a source of one gallon glass jars formerly containing pickles, peppers, etc. If the lids are still in good condition, they are well suited to bulk storage and can be reused over and over.

Metal cans, by and large, are not reusable for good storage, but some companies might be able to sell you new cans. The traditional single use #10 can is only the beginning of what might be available with a little looking. Gallon sized or larger cans with double friction lids (like paint comes in) make excellent storage containers and some companies make them food safe. One gallon and larger cans with wide diameter screw caps are available from some companies as well. You might have seen some of these holding edible oils, soy sauce, honey and other liquid food. If they come with a cap that will seal air tight they would be well suited for bulk storage of grains and legumes, particularly if they come in a four to six gallon size.

Pick up you local phone book, log on to your favorite search engine or head to your local public, college or university library and explore the possibilities. Make it clear that what you want must be FDA approved and be up front about how many you need or can deal with. If one company won't deal with you, try another. You'll eventually get what you want.

From: Denis DeFigueiredo ddefig@newhall.com
Originally posted in: rec.food.preserving

I called Berlin [eds. note, a plastic container mfgr.] 1-800-4-BERLIN and spoke to them, plus an outfit called Kirk Container (they manufactured some 5 gallon paint buckets I saw in the local hardware store). Both places said that buckets made from High Density PolyEthelene (HDPE) are approved for food. It has to do with the possibility of interaction between any chemicals in the food and the plastic. As it turns out, Kirk manufactures only one kind of bucket, and then markets it for paint, hardware, food, etc. The price is right on the "paint buckets" - much cheaper than the local restaurant supply house.

High density polyethelene buckets will have HDPE stamped on them, or a recycle symbol with a "2" in the middle.

DISCLAIMER: I'm only passing on information I received from the manufacturers. I am in no way professing these things to be absolute fact!

From: "Jenny S. Johanssen" johanssen@matnet.com
Originally posted in: rec.food.preserving

Denis - saw your comments on food grade buckets and thought I'd offer my solution. My son cooks at a local Mexican restaurant. They get all their strawberries (for the strawberry magaritas at the bar) in 3 gallon plastic buckets. Now you know how many margaritas pass through a Mexican bar each night - lots. So I asked my son to save me some buckets. They are ideal for storing flour, rice, I made (from my home grown raspberries) a delicious raspberry cordial in one of the buckets, another I made Raspberry wine in. My motto is why buy when you can recycle! Thanks for giving me the time and space to add my two-bits worth. - Jenny

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From: Woody Harper lager@primenet.com
Originally posted: rec.food.preserving

...I get topping buckets from Dairy Queen and I have to make sure there is no trace of the strawberry syrup left. A little detergent and elbow grease followed by a chlorine solution bath keep everything nice and clean.--

A.2 PLASTIC PACKAGING

Before we can intelligibly discuss plastic packaging it is necessary to understand what the substance we call "plastic" is. Plastics are produced from basic polymers called "resins", each of which have differing physical properties. Additives may be blended in to color them or to modify particular properties such as moldability, structural properties, resistance to light or heat or oxidation. Additionally, it is common for several different kinds of plastic to be laminated together each performing a particular desired task. One might offer structural rigidity and the other might be more impermeable to the transfer of gasses and odors. When bonded together a rigid, gas impermeable package can be made.

Whether that package is safe for food use will depend on the exact nature of the additives blended into the plastic. Some of them, notably plasticizers and dyes, can migrate from the packaging material into the food it's containing. This may be exacerbated by the nature of the food it's in contact with especially if it is high fat, strongly acidic or alcoholic in particular. Time and temperature may also play a prominent role in the migration of plastic additives into food. For this reason, the (US) FDA assesses the safety of packaging materials for food contact and conducts toxicological studies to establish safety standards. Only

plastics that are FDA approved for a particular food type should be used for direct contact with that food.

Just being FDA approved, however, may not be all of the story. It must still be determined whether the particular plastic in question has the physical properties that would make it desirable for your purpose.

As mentioned above each base resin has somewhat differing physical properties that may be modified with additives or combined by laminating with another plastic or even completely unrelated materials such as metal foils. An example of this is "Mylar", a type of polyester film. By itself, it has moderate barrier resistance to moisture and oxygen. When laminated together with aluminum foil it has very high resistance and makes an excellent material for creating long term food storage packaging. One or more other kinds of plastic with low melting points and good flow characteristics are typically bonded on the opposite side of the foil to act as a sealant ply so that the aluminized Mylar can be fashioned into bags or sealed across container openings. The combined materials have properties that make them useful for long term storage that each separately do not have.

Probably the most common plastic that raises suitability questions is High Density PolyEthylene (HDPE). It's used in a wide array of packaging and is the material that most plastic five and six gallon buckets are made of. It has a moderate rigidity, a good resistance to fats, oils, moisture and impacts, a fair resistance to acids, but is a poor barrier to oxygen.

Whether it is suitable for your purpose depends on how sensitive to oxygen exposure your product is and how long you need it to stay in optimal condition. Foods such as whole grains are not particularly delicate in nature and will easily keep for years in nothing more than a tightly sealed HDPE bucket. Most legumes are the same way, but those that have high fat contents such as peanuts and soybeans are more sensitive to O2. Other foods such as dry milk powder might only go a year before deleterious changes are noticed. If that milk were sealed in an air-tight aluminized Mylar bag with the oxygen inside removed, the milk would probably go for two years or more. Better still would be to seal the milk in a metal can or glass jar. HDPE can still be used for long term storage, but with one or more of the following precautions to keep a high food quality: The food should either be put on a shorter rotation cycle than packaging also using a second gas barrier such as Mylar; be periodically opened and re-purged or fresh absorbers should be inserted.

Some special plastics and plastic laminates have excellent oxygen and moisture barrier properties and are eminently suited to long term storage, but for home use they are not easy to find, though some used containers might be available for reuse..

A.2.1 HOW DO I GET THE ODOR OUT OF PICKLE BUCKETS?

I've had fairly good luck doing it in the following way. Since

vinegar is the primary smell in pickles and it's acidic, we used a base to counteract it. First we scrubbed the bucket well, inside and out, with Dawn dish detergent. Most any sort will do. Then we filled the buckets with hot water and dissolved a cup of baking soda in each. Stir well, get the bucket as full as you can and put the top on. Put the bucket in the sun to keep it warm so the plastic pores stay open as much as possible. In a couple of days come back and empty the buckets. Rinse them out, fill with warm water again and add about a cup of bleach and reseal. Put back in the sun for another couple of days. Empty out and let dry with the tops off. We completely eliminated the vinegar smell this way. It might be possible to cut the time down a lot, but we haven't experimented that much since we can't get that many pickle buckets.

A.3 METAL CANS

Metal cans and glass jars being heat resistant, can both be used for heat processed, wet-pack foods and for non-heat treated dry pack canning. For wet foods, however, metal cans have several disadvantages for the do-it-yourselfer. They are hard to come by, and they take specialized equipment to use that can be difficult to locate. Probably the greatest flaw which makes them unpopular for home canning heat processed wet-pack food is that they can only be used once. Since the commercial canning industry is not interested in reusing the containers, metal cans make great sense for their purposes. The cans are both cheaper (for them) and lighter than glass jars. This adds to the economy of scale that makes canned foods as cheap as they are in the grocery store.

For home canning, wet-pack heat processed foods glass jars are better because even the smallest of towns will usually have at least one business that carries pressure and boiling water canners along with jars, rings and lids. With metal cans a can sealer is necessary and this usually has to be ordered from the manufacturer or a mail-order distributor. A few of which are listed in the Resources section.

Metal cans are not really made entirely of tin. They're actually steel cans with a tin coating on the inside and outside. Some kinds of strongly colored acidic foods will fade in color from long exposure to tin so a type of enamel liner called "R- enamel" is used to forestall this. Certain other kinds of food that are high in sulfur or that are close to neutral in pH will also discolor from prolonged contact with tin. For those foods, cans with "C-enamel" are used.

The excellent food preservation book, *Putting Food By* Chapter 6 (see reference list) has a section on the use of metal cans for wet packed foods.

It is in dry-pack canning that metal cans for home use begin to come into their own. Because microbiological sterilization isn't necessary, foods that are dry packed into containers do not have to be subjected to heat processing nor does the safety of their seals depend upon the vacuum that the cooling contents create. This means that other

packaging methods and container types may be used.

Probably the most common use of metal containers is the #10 cans such as are used by the LDS family canneries discussed below. This is not the only way they may be used though. It will probably take a bit of searching, but there are various food grade metal containers available of sufficient volume to make them useful for food storage. They usually have double friction lids similar to paint cans or screw caps like jars that can achieve an air-tight seal. If you can find them in a large enough volume capacity they can be of real use for storing bulky foods such as grains, legumes and sugar. Smaller cans of a gallon or less would be useful for storing items like dry milks. If properly sealed, metal cans have a far higher barrier resistance to gasses such as oxygen, CO2, and nitrogen than any plastic.

Although they can hardly be considered portable the use of metal drums (not garbage or trash cans), either themselves food grade or used with food grade liners, is also a possibility. A fifty five gallon drum full of grain will weigh several hundred pounds, but may make for a much easier storage solution than multiple buckets. The advantage of using such a large container is that a great amount of a single product can be kept in a smaller amount of space and fumigating or purging the storage atmosphere would be simpler. The disadvantages are the difficulties of moving it and rotating the stock in the drum. If using oxygen absorbers make sure the drum you want to use is capable of making an air-tight seal, otherwise you should stick with carbon dioxide fumigation.

A.3.1 POOLING RESOURCES: THE CHURCH OF JESUS CHRIST OF LATTER DAY SAINTS -- THE MORMONS

Although the purchase of a can sealer and metal cans for home use is not economically feasible for most people there is one way that it can be. This is by pooling community resources to purchase the equipment and supplies. It may even, in fact, not be necessary to form your own community to do this. If you live in the right area your local Latter Day Saints church may have facilities they will allow you to use. They may even have suitable food products to sell you. This is an offshoot of the church's welfare programs and it is done in their family canneries. Rather than using plastic buckets they have gone over to using metal cans church-wide for dry-pack canning. By sharing the cost of the equipment and purchasing the cans in bulk quantities, they are able to enjoy the advantages of metal cans over plastic containers while minimizing the disadvantages of cost. As we approach the end of the Millennium, other groups, both religious and secular, are purchasing can sealers in order to facilitate their own food storage programs as well.

Please see VI.F.1 Organizations. The Church of Jesus Christ of Latter Day Saints -- LDS Family Canneries for more detailed information about where LDS Family Canneries may be found and how best to approach using them.

Any food products you want to have sealed in cans will need to fall within the LDS cannery guidelines of suitability for that type of

packaging. This is for reasons of spoilage control since many types of foods just aren't suitable for just sealing in a container without further processing. If you purchase food products from them, they will already be within those guidelines. *A brief treatment of these guidelines may be found in VI.F.1 LDS Family Canneries Guidelines.*

Once you have your foodstuffs on hand, either supplying your own or by purchasing them from the cannery you're ready to package them. It is here that using some forethought concerning your packaging system can save you much time and aggravation. With the Millennium coming upon us the traffic load of the canneries is really beginning to pick up. This means that access time to the can sealers and other equipment may be limited.

IMPORTANT NOTE: Please do keep in mind that the individuals responsible for the family canneries are all *volunteers* with demands on their time from many areas. Be courteous when speaking with them and, if there are facilities for use, flexible in making arrangements to use them. You will, of course, have to pay for the supplies that you use, cans and lids at the least, and any food products you get from them. With the onset of the millennium the LDS family cannery volunteers are becoming quite busy so be prepared to have to work with their available scheduling. As a general rule they cannot put your food in storage for you. Be ready to pay for your purchases in advance, if necessary. They do not take credit cards and probably cannot make change so take a check along with you.

The following is a list of suggestions to make the most efficient use of your access time:

#1 - Make your appointment well in advance. Many people are beginning to make use of the canneries so making advanced reservations is a must.

#2 - Have enough people to set up an assembly line type operation. Make sure each of your people knows what they need to do and how to do it. At least four people for any serious amount of food is a good number. Ask the cannery volunteer to go over the process with you and your crew.

#3 - Make sure you have enough muscular helpers to do the heavy lifting so you don't wear yourself out or hurt your back. Some of the supplies you will be working with, such as wheat, come in fifty pound bags and a box of #10 cans full of sugar or other weighty items are heavy.

#4 - Make labels for the foods you are going to pack in advance. This will save time after the cans are filled.

#5 - Take out only as many as oxygen absorbers as you can seal up in a half hour. They use up most of their capacity within two to three hours depending on temperature and humidity. You don't want them to waste any by soaking up the oxygen in the room. The ones you don't use up right away should be tightly sealed

in a gas proof container.

#6 - Save powdery food items such as dry milk powder, pudding mixes and grain flours and meals till last. They can be messy to can and this will keep them out of your other foods.

#7 - Leave time to clean up after yourself. They are doing you the courtesy of using their equipment and selling you the supplies at cost. You should return the favor by leaving the place at least as clean as you found it.

#8 - Always keep in the back of your mind just how much volume and weight your vehicle can carry. You'd hate to find you canned more than you could carry home.

See also IV.C.2 Preventing Corrosion of Canned Goods.

A.4 GLASS JARS

Compared to metal cans, glass jars are very stable, although they obviously don't take being banged around very well. The cardboard boxes most jars come in are well designed to cushion them from shocks. The box also has the added bonus of keeping damaging light away from food.

The major advantage of glass jars is that they are reusable. For wet-pack canning the lids must be replaced, but the rings don't. For dry pack canning even the lids may be reused probably indefinitely.

When you get right down to the bottom line, it is seldom practical strictly in terms of dollars and cents to wet-pack your own food in jars. When you count the cost of your equipment, including the jars, rings, lids and all the rest, along with a not inconsiderable amount of your personal time, the cost of purchasing or growing your produce, you'll almost always come out ahead to buy food canned for you by the commercial canning industry. That said, forget about the strict bottom line and examine more closely why you want to put up your own food. For many, gardening is a pleasure and they have to have something to do with the food they've grown! There's also the fact that for many, you simply cannot buy the quality of the food you can put up for yourself. The canning industry tries to appeal to a broad spectrum of the general public while you can put up food to your own family's specific tastes. Home canning is not so much about saving money as it is about satisfaction. You get what you pay for.

If home canning appeals to you, please allow me to point you toward the *rec.food.preserving FAQ* where much very good information about methods and techniques may be found.

Dry-pack canning using glass jars, on the other hand, may well make a great deal of economic sense. It is usually far cheaper per pound to purchase food in bulk quantities, but often unsuitable to store it that way. Breaking the food down into smaller units allows for easier

handling and exposes a smaller quantity of food to oxygen and moisture before it can be used up. Of course, packaging used for doing this can be made of many different materials, but glass is often the easiest and most convenient to acquire and use. Used containers are frequently suitable and are often free or of little cost. One source of gallon sized glass jars are sandwich shops and restaurants that use pickles, peppers and other sandwich condiments. I have a Subway sandwich shop that saves its pepper jars for me and receive several per week. There are also half-gallon canning jars, though they are sometimes difficult to find. The brand I buy is made by Kerr.

A.5 MYLAR BAGS

The word "Mylar" is a trademark of the DuPont corporation for a special type of polyester film. Typically made in thin sheets, it has a high tensile strength and is used in a wide variety of industrial settings.

In food storage, particularly for the long term, it is commonly found as a laminate with Mylar as the top layer, a very thin aluminum foil in the middle and one or more other types of plastic films on the bottom acting as sealant plies. This laminate combination possesses a high resistance to the passage of oxygen, carbon dioxide, nitrogen, other gasses and water vapor and is what makes it valuable for our purposes. Unfortunately, it has a poor puncture resistance so it must be used as an interior liner for more puncture resistant containers rather than as a stand- alone package.

Food grade aluminized Mylar complies with US FDA requirements and is safe to be in contact with all food types except alcoholic.

For food use, Mylar is most commonly available as pre-made bags of various sizes. Flat sheets or rolls of the material might also be found from which bags could be fashioned as well.

When Mylar bags are used by the storage food industry they are generally for products sealed in plastic buckets. The reason for doing this is that the High Density PolyEthylene (HDPE) from which the pails are made is somewhat porous to gasses. This means that small molecules, such as oxygen (O2), can slowly pass through the plastic and come into contact with the food inside. The problem is further compounded if oxygen absorbers are used, as the result of their absorbing action is to lower the air pressure inside the container unless it has first been carefully flushed with an inert gas such as nitrogen. How fast this migration activity will occur is a function of the specific plastic formulation, its wall thickness and the air pressure inside the container. In order to gain the maximum possible shelf life a second gas barrier, the Mylar bag, is used inside the pail.

Whether the use of these bags is necessary for your home packaged storage foods depends on how oxygen sensitive the food item is and how long you want it to stay fresh. If the container is made of a gas impervious material such as metal or glass then a second gas barrier

inside is not needed. If it is HDPE or a plastic with similar properties and you want to get the very longest possible storage life (say 10+ yrs for grain) then Mylar is a good idea. If you're going to rotate that grain in four to five years or less then it is not needed. Provided the oxygen has been purged from the container in the first place, either with a proper flushing technique, or by absorption, there will not have been sufficient O2 infiltration to seriously impact the food. Particularly oxygen sensitive foods such as dry milk powders that are to be kept in plastic containers for more than two years would benefit from the use of Mylar. Naturally, storage temperature and moisture content is going to play a major role as well.

There is also the question of the seal integrity of the outer container. If you are using thin walled plastic buckets in conjunction with oxygen absorbers the resulting drop in air pressure inside the pail may cause the walls to buckle. If this should occur, there would be a risk of losing seal integrity, particularly if the buckets are stacked two or more deep. If the food was packed in Mylar bags with the absorbers inside this would keep the vacuum from seriously stressing the container walls. Better still would be not to have the problem at all by either using containers of sufficient wall thickness or flushing with inert gas before sealing. Wall thickness is one reason why the six gallon SuperPails have become so widespread. It should be noted that Mylar is not strongly resistant to insect penetration and not resistant at all to rodents. If mice chew through your buckets, they'll go right through the bags.

A number of retail dealers carry Mylar bags. Contact information may be found in the suppliers section.

A.5.1 HOW DO I USE MYLAR BAGS?

Sealing food in Mylar bags is a straight-forward affair, but it may take a bit of practice to get it right, so purchase one or two more bags than you think you'll need in case you don't immediately get the hang of it.

#1 - The bags typically sold by storage food dealers look rather large when you compare them to the five or six gallons buckets they are commonly used in. That extra material is very necessary if you are to have enough bag left over after filling to be able to work with it. Unless you are very sure of what you are doing, don't trim off any material.

#2 - Place the bag inside the outer container and fill with the food product. Resist filling it all the way to the top. You need at least an inch or so below the bucket rim left open to get the lid to seat completely.

#3 - When it seems to be full, gently thump the pail on the floor a few times to pack the product in and reduce air pockets. Add any makeup food necessary to bring level back to where it should be.

#4 - Take the bag by the corners and pull out any slack in the material so that all sides can be pulled together evenly. Place your oxygen absorbers inside if you are going to use them. Now place a board over the top of the bucket and fold the bag end down over it keeping it straight and even. Place a piece of thin cotton fabric such as sheet or t-shirt material over the edge of the bag mouth. Using a clothes iron set on the cotton, wool or high setting run it over the cloth-covered Mylar about a half-inch from the edge for about twenty seconds or so until it seals. You'll probably have to do the bag in sections. Experimenting on a left-over strip to find the right temperature setting is a good idea.

#5 - When you've done the entire mouth of the bag allow it to cool. Once cool try to pull the mouth of the bag open. If it doesn't come open, fold the bag down into the pail until you feel the trapped air pillowing up firmly against the material and wait to see if it deflates. If it doesn't, then your seal is good. You can seal on the bucket lid at this point or take the further step to vacuum or gas flush the bag.

Once a seal has been obtained the bags can be left as-is, vacuum sealed or gas flushed. To obtain the most efficient oxygen removal the bags can be first drawn down with a vacuum pump and then purged using an inert gas.

VACUUM SEALING MYLAR BAGS

Once you have obtained a good seal on the bag, pulling a vacuum on the contents is also pretty straight forward.

First you'll need something to make a vacuum with. This can be either a regular vacuum pump, a vacuum sealer such as the Tilia Food Saver or even the suction end of your household vacuum cleaner. The end that is to be inserted into the bag will need to be of fairly small diameter in order to keep the hole in the Mylar from being any larger than necessary. This means that if you use a vacuum cleaner you'll need to fashion some form of reduction fitting.

Cut a hole into the Mylar bag on a corner, making the opening only just large enough to admit the vacuum probe. Insert the nozzle and using a sponge, or something similar, push down on the material over the probe to make a seal. Now draw down a vacuum on the bag. It will probably only take a second or two. When it's drawn down as much as possible, run a hot iron diagonally across the cut corner resealing the bag.

GAS FLUSHING MYLAR BAGS.

Flushing with inert gas works essentially just like vacuum sealing

except that you're putting more gas into the bag rather than taking it out. You'll want to keep the entry hole small, but don't make a seal around it as above. Beyond that, follow the directions as given in Section IV.B.2 - CO2 and Nitrogen. When you feel that the bag has been sufficiently flushed, run the iron across the corner just as above to seal.

Flushing with dry ice can also be done, but it is important to wait until the frozen carbon dioxide has completely sublimated into gas before making the final seal otherwise the bag will burst like an overfilled balloon.

A.6 REUSING OR RECYCLING PACKAGING

In an effort to save money or because new packaging may be hard to come by, it is common for many people to want to re-use previously used containers. There is nothing wrong with this, but it is sometimes more complicated than just using new containers would be. Here are some general "rules of thumb" that can be used if you have an interest in doing this.

#1. Do not use containers that have previously contained products other than food. There are two risks this can expose you to. The first is that the particular package type may not have been tested for food use and may allow the transfer of chemicals from the packaging into your food. The second is that all plastics are porous to some degree. Small amounts of the previous contents may have been absorbed by the packaging material only to be released into your food, particularly if it is wet, oily or alcoholic.

#2. Previously used containers should only be used with foods of a similar nature and exposed to similar processes. This means that if a container previously held a material high in fat, such as cooking oil, then it should not be used to store a strong acid such as vinegar. Nor should a container be exposed to extreme conditions, such as heat, if the original use of the package did not subject it to that treatment. An exception to this is glass which is covered below. Generally speaking, dry, non-oily, non-acidic or alkaline, non-alcoholic foods may be safely contained in any food safe container. An example of this is keeping grains and legumes in HDPE buckets formerly containing pickles.

#3. Glass may be used to store any food provided it is in sound condition and has only been used to store food previously. The lid or cap, however, that seals the jar is subject to the cautions given above. Glass jars not specifically made for home canning, either boiling water bath or pressure canning, have a significant risk of breakage if used for that purpose.

#4. Porous packaging materials such as paper, cardboard and

Styrofoam should not be reused. Their open texture can trap food particles and are very difficult to adequately clean. Packaging formerly holding raw meats or shelled egg products are particularly at risk.

#5. Containers previously holding odorous foods may trap those odors and transfer them to foods later stored. Trust me, pickle flavored milk leaves a lot to be desired. Foods such as dry milk powders, fats and oils, flours and meals will absorb any odors seeping from your container material. Be sure to get the smell out before you fill them.

B -- CO2 AND NITROGEN

Carbon dioxide (CO2) and nitrogen (N2) are commonly used in packaging both fresh and shelf-stable foods, in order to extend their usable shelf lives. Fresh foods are outside the scope of this work so attention shall be focused only on those foods suitable for use in storage programs.

The most common use of these gasses is for excluding oxygen (O2) from the atmosphere contained inside of a storage container (called head gas). When oxygen levels can be dropped below 2% the amount of deleterious oxidation reactions in stored foods can be greatly decreased resulting in longer palatability and nutritional shelf lives. Actually achieving this low oxygen content is not a simple matter when limited to the equipment and facilities typically available in the home. With careful technique and proper packaging materials it is possible to achieve useful results though.

In order for either gas to be used most effectively to gain the longest possible shelf life it is recommended that it be contained inside of packaging with high barrier properties to prevent it from diffusing out over time or allowing oxygen to infuse in. Examples of this kind of packaging are Mylar and other high barrier property plastics, metal cans and glass jars. Buckets made of HDPE plastic are poor gas barriers and will, over time, allow oxygen to infuse into the container. In order for foods to be kept for their maximum shelf lives the containers would need to be re-purged every three to four years. Foods that are particularly oxygen sensitive, such as dry milk powders, should not be stored in HDPE without a secondary gas barrier. It is possible to use HDPE buckets alone when gas purging if a shorter rotation period is used. An example would be using wheat in four to five years instead of the eight to ten that would be achievable if a high barrier container were used.

Purging efficiency can be greatly improved when used with a vacuum device. By first drawing down the head gas of the container and then flooding with the purging gas much more oxygen can be removed from the container. Repeating the process once more will improve removal efficiency even more. If a true vacuum pump is not available, the suction end of a home vacuum-cleaner can be made to serve and still

achieve useful results. With careful technique, oxygen levels can be dropped to be 0.5-2%. Finely textured materials such as grain flours and meals, dry milk powders and similar textured foods will purge poorly and are better packaged with oxygen absorbers. Instructions for vacuum usage are given in *A.5.1 Using Mylar Bags.* Instructions for gas purging are given below in *B.1 Dry Ice and B.2 Compressed Nitrogen*.

A less common, but important use for carbon dioxide is fumigation. This is the killing or retarding of insect life contained in a product. Many chemical fumigants are available to do this but are not thought desirable by many who have foodstuffs they want to put into storage. CO2 is not as certain as the more toxic fumigants, but it can be made to work and will not leave potentially harmful residues behind. It is possible for nitrogen to work in a similar manner, but it must be in a head gas concentration of 99%+ whereas carbon dioxide can be effective over time at levels as low as 3%. The precise amount of time necessary for the gas to do its work will vary according to the specific species and growth stage of the insect along with the temperature and humidity level of the product being fumigated. In general, the more active the growth stage and the warmer the temperature the more effective CO2 is in killing weevil infestations. The gas also exhibits bacterial and fungal inhibiting properties, but for our purposes this will be of little moment since all foods should be too dry to support such growth in the first place.

The procedure for fumigating foodstuffs with carbon dioxide is precisely the same as the one used in purging oxygen from storage containers mentioned below. The only change is that for the fastest effectiveness the sealed container should be left in a warm place for a week or so before moving it into its final storage location. The gas is still effective at cooler temperatures, but because insect life is slowed by lower temperatures the carbon dioxide takes longer to complete its mission.

NOTE: Both Mitsubishi Gas-Chemical, maker of the Ageless line of oxygen absorbers, and Multisorb, manufacturer of the FreshPax D 750 absorbers, state the their products should not be used in a high carbon dioxide head gas environment.

B.1 DRY ICE

Using dry ice to displace oxygen from food storage containers is a very straightforward affair. To get the best purging results it is recommended that all foodstuffs and packaging materials be put in a warm location for a few hours before beginning the purging process. The reason for this is that the cold CO2 sublimating from the dry ice will be denser than the warmer, lighter oxygen containing air. The cold gas will tend to stay on the bottom, gradually filling the container and pushing the warm air out of the top.

When you first pick your dry ice up from the supplier, put it in a moisture proof container so that water vapor will be less able to condense and freeze on it. The sublimating gas will prevent you from

being able to tightly seal it, but you can slow down any water ice accumulation.

Assemble the container and any interior packaging materials. Break off a piece of dry ice of sufficient size for the volume to be purged. One pound of dry ice will produce about 8.3 cubic feet of carbon dioxide gas so approximately four ounces per five gallon bucket will do. Wipe off any accumulated water frost which should look whiter than the somewhat bluish frozen gas. Wrap in a paper towel to keep foodstuffs out of direct contact. Place in the bottom of the container that will actually contain the food, i.e. the bag. Fill the package with the food product, shaking and vibrating while doing so to achieve the maximum packing density.

If a vacuum process is not to be used then place the lid on the container, but do not fully seal. If a liner bag is being used then gather the top together or heat seal and cut off a small corner. This is to allow the air being purged to escape as it is pushed upward by the expanding gas from the dry ice. Do not move or shake the container while the ice is sublimating so as to minimize turbulence and mixing. After approximately two hours complete the seal. Check the container every fifteen minutes or so to be sure that a pressure build up is not occurring. A small amount of positive pressure is OK, but do not allow to bulge.

If a vacuum process is used then cut off a corner of the bag and insert the probe or place the container in the vacuum chamber. Draw a vacuum and when it has reached the desired point shut it off, but do not allow air to get back inside. When the dry ice has finished sublimating seal the container. If a slightly larger piece of dry ice is used this process may be repeated once more to improve oxygen removal. Watch for pressure signs as above.

NOTE: It is natural for some grains and legumes to adsorb carbon dioxide when stored in a atmosphere with high levels of the gas. This will result in a drop in head space air pressure much like using oxygen absorbers will cause as they absorb oxygen. Precautions should be taken in thin walled containers against buckling and possible loss of seal integrity. When the food products are removed from the container they will release the adsorbed CO2 and suffer no harm.

WARNING: Dry ice (frozen carbon dioxide) is extremely cold and can cause burns to the skin by merely touching it. Because of this you should wear gloves whenever handling it. Also, dry ice evaporates into carbon dioxide gas, which is why we want it. CO2 is not inherently dangerous, we breath it out with every breath we take, but you should make sure the area you are packing your storage containers in is adequately ventilated so the escaping gas will not build to a level dangerous enough to asphyxiate you.

IMPORTANT NOTE: Because dry ice is very cold, if there is much moisture in the air trapped in the container with it, and your food, it will condense. Try to pack your containers on a day when the relative humidity is low or in an area with low humidity, such

as in an air-conditioned house. Use of a desiccant package when using dry ice to purge storage containers may be a good idea.

B.1.1 DRY ICE SUPPLIERS

Dry ice may be found at ice houses, welding supply shops, some ice cream stores, meat packers or you could look in your local phone book under the headings "dry ice" or "gasses".

B.2 COMPRESSED NITROGEN

B.2.1 TYPES OF AVAILABILITY

Both nitrogen (N2) and carbon dioxide (CO2) are commonly available in the form of compressed gas in cylinders. In food storage, CO2 is mainly used in the form of dry ice (see above) which is often easier to acquire with much less equipment needed to use it. Because of this, I'll be limiting this section to the use of compressed nitrogen. If for some reason you prefer to use compressed CO2 the information given below will work for it as well, though cylinder sizes may differ.

In the U.S. there are about eight principal suppliers of compressed gasses: Air Liquide, Airco, Linde, Air Products, Matheson, Liquid Carbonic, MG Industries, and Scott. One or more of these producers should have compressed gasses available in virtually every area of the United States and Canada.

Locating a source of compressed nitrogen is probably as easy as looking in your local phone book under the headings "compressed gas suppliers", "gasses", or "welding supplies". Other sources might be automotive supply houses, university or college research departments, vo-tech schools, and medical supply houses.

Nitrogen is generally available in a number of forms ranging from gas intended for welding, to various purity assured types, to gas mixtures where N2 would be one of the components.

Unless you are very knowledgeable about compressed gasses and the equipment needed to use them it is strongly recommended that you not use any gas mixtures in your food storage, but rather to stay with pure nitrogen gas. Use of compressed gas mixtures requires knowledge and equipment beyond the scope of this FAQ.

IMPORTANT NOTE: Welding nitrogen is essentially a pure gas, but it has one important caveat. When a cylinder of welding gas is used there is an unknown possibility that some form of contaminant may have backfed into the cylinder from a previous user. Possibly this could happen if the tank was being used in an application where the cylinder's internal pressure fell low enough for pressure from whatever the tank had been feeding to backflush into the cylinder. Alternatively, the tank pressure may have become depleted and was

repressurized using ordinary compressed service air. The most likely contaminants will be moisture, carbon monoxide, carbon dioxide, oxygen and hydrocarbons, but there is the remote possibility of something even more exotic or toxic getting into your cylinder. Welding gas cylinders may not be checked by the gas supplier before being refilled and sent back out for use. It is this remote, but unknown possibility of contamination that causes me to recommend against the use of welding grade nitrogen in food storage. If your supplier is willing to certify that welding gas cylinders are checked before refilling then they would be OK to use.

The varying types of purity assured nitrogen gas are slightly more difficult to find and slightly more expensive in cost, but I believe this is more than made up for by the fact you know exactly what you're getting. Air Liquide, as an example, offers seven types of purity assured nitrogen ranging from 99.995% to 99.9995% pure with none having a water vapor content over 1 part per million (ppm) or an oxygen content over 3 ppm. Any of them are eminently suited to the task so the most inexpensive form is all you need buy.

As you might expect, compressed gas cylinders come in a number of different sizes. For the sake of simplicity I will address only the most common cylinder sizes since they will almost certainly be the most inexpensive as well.

Again using Air Liquide as an example, it is their size 44 and 49 cylinders that are the most common. There are other cylinder sizes of smaller physical dimensions and capacities. However, the logistics of compressed gas production and transport being what they are, they frequently will cost as much or even more than the larger, more common sizes. The actual gas inside the cylinder is fairly cheap. Filling and moving the heavy cylinders around is not.

Table 1. Air Liquide most common cylinder sizes.

Cyl Size	Capy Cu Ft	Filled PSIG	Wt Lbs	Ht In	Dia In
44HH	445	6000	339	51	10
44H	332	3500	225	51	10
49	304	2640	165	55	9.25
44	234	2265	149	51	9
16	77	2000	71	32.5	7

Legend:

The "H" suffix means high pressure.

PSIG = Pounds per Square Inch on the Gauge, this does not reflect atmospheric pressure which would be Pounds per Square Inch Absolute (PSIA). PSIA is the absolute pressure of atmospheric and internal cylinder pressure combined.

Although it is not a very common size, I left the #16 cylinder in the above table in case someone really wants or needs to use a smaller cylinder.

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Table 2. Cylinder Size Comparison. Abbreviated table.
(Alphagaz in Column 1)

Cyl Size [1]	Airco [2]	Air Prod [3]	Linde [4]	Liq Carb [5]	Math [6]	MG Ind [7]	Scott [8]
49	300	A	T	J	1L	300	K
44L	200	-	K	H	1A	200	A
44	200	B	-	-	-	-	-
44H	-	BY	3K	-	1H	2HP	-
44HH	500	BX	6K	-	1U	3HP	-
16	80	C	Q	M	2	80	B

Legend:

[1] Alphagaz (Air Liquide)
[2] Airco
[3] Air Products
[4] Linde
[5] Liquid Carbonic
[6] Matheson
[7] MG Industries
[8] Scott

Reference: High Purity Specialty Gases and Equipment Catalog; copyright 1995, Air Liquide America Corporation, Houston TX USA; pages 6 and 7.

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As you can see, the size 49 cylinder from Air Liquide has an equivalent from all eight manufacturers. This size is the one commonly seen being used to fill helium balloons at county fairs and ball games.

B.2.2 OBTAINING THE GAS AND NECESSARY EQUIPMENT

Although you can purchase your own cylinder the most inexpensive way to use nitrogen is to rent a cylinder from your gas supplier. This

may require filling out an application, paying a refundable cylinder deposit and buying the gas contained in the cylinder. Tank rental periods can vary, but the most common is for thirty days.

Having rented or purchased the cylinder you must now get it home. Delivery by the supplier can often be arranged or they may assist you in getting the cylinder into your vehicle. The preferred method of transportation is for the cylinder to be chained, clamped or otherwise solidly secured in a vertical position in the transporting vehicle with the cylinder cap in place. Transportation requirements vary from nation to nation, state to state and even city to city so your best bet is to inquire of your gas supplier to find a safe and legal means of moving the tank.

IMPORTANT NOTE: The major expense in using compressed gas is not the cost of obtaining the gas itself, but in the equipment needed to safely handle and control it. Unless you can borrow the appropriate mechanisms they will have to be purchased, new or used, and even the cheapest regulator and gauge are not inexpensive. There is a temptation to forgo the expense and not use a regulator, but I must caution strongly against this. As table 1 above shows, a full cylinder of compressed gas will have an internal pressure of 2000+ PSIG. Normal atmospheric pressure is about 15 PSIA. If the cylinder valve was opened only slightly too far a great deal of very high pressure gas will flow through the delivery hose and metal wand and the potential for serious injury when it began to whip around would be very great. For your safety, get the necessary equipment. If you purchase your own regulator/gauge cluster and/or your own cylinder, there is necessity for periodic maintenance. Regulators and gauges need to be calibrated (using a water deadweight calibrator) and cylinders need to be hydrostatically tested, typically every ten years for both. Your gas supplier can provide you with more detailed information.

The only equipment that will come with your cylinder is the cylinder cap. "Don't leave home without it" and they mean it. All of the common cylinder sizes will use the CGA-580 (Compressed Gas Assembly) cylinder fitting. The downstream side of this fitting can be obtained with different threads, but a 1/4" NPT (National Pipe Thread) nipple is normally needed to mate with the regulator body. The nipple is really nothing more than just a short length of high pressure pipe. The CGA fittings come in a variety of metal compositions such as carbon steel, stainless steel and brass. The best choice is one which matches the composition of the regulator body. If the CGA fitting and regulator are to be used only with dry, non-oxygen gasses, in a dry environment then galvanic corrosion can be disregarded so the most inexpensive metal composition can be used even if it is not the same as the regulator. If it is to be used in a wet area, or with oxygen containing gasses then matching metal composition becomes very important.

When the tank is to be returned there must be some residual pressure still in the cylinder or the renter might have to pay a surcharge or lose their deposit. This is particularly true of purity assured gasses because the residual gas composition will be analyzed. This is done for the safety of all cylinder users.

The regulator/gauge cluster should be carefully removed using the same procedure that is described below to put it all together. Care should be taken not to damage the cylinder valve threads. Replace the cylinder cap and transport in the same manner as you brought it home.

B.2.3 PUTTING IT ALL TOGETHER

If the fitting and regulator are bought separately then some 1/2" wide Teflon tape is recommended for assembly since it is a clean and inexpensive way of sealing pipe joints. Looking into the open end of nipple wrap the tape clockwise around the threaded end for 1.5 to 2 turns, working from the open end backwards. If you want to do a neat looking job, the tape may be slit lengthways to make it 1/4" wide, but this is not a requirement. A brass nipple may shrink somewhat during tightening and need a bit more tape than a harder metal like stainless steel would. The Teflon tape should only be used on the end of the nipple that attaches to the regulator body, NOT to any part of the cylinder end.

The regulator end has tapered threads and uses them directly for sealing. The cylinder end has straight threads and depends upon the precision mating of machined metal surfaces to seal. The cylinder end threads simply apply the clamping force.

Before attaching the CGA fitting to the cylinder the user should put on safety glasses and good hearing protection. The cylinder valve can then be cracked very slightly to blow out any dust or debris. After closing the valve, inspect the cylinder valve and nipple for any abrasions, nicks, gouges, embedded particles, etc., before attachment is made.

You will need two wrenches (not adjustable pliers) to equalize the torque, particularly on the cylinder valve where it should be minimized. Put one wrench on the fitting and the other wrench on the cylinder valve and make the join.

Once the regulator/gauge cluster has been mated to the cylinder, the delivery hose can now fitted to the regulator and the metal wand to the other end of the hose. The wand is nothing more than a short length of metal tubing at least six inches greater in length than the depth of the buckets to be filled. Copper water line works well.

When the joins have been made, a mixture of a short squirt of dish washing detergent and water can be used to check for leaks. Be certain the detergent does not contain ammonia. Pour some on each fitting working from the cylinder end outward, opening each valve and pressurizing as you go. Once the leak check is finished rinse off and wipe down all surfaces to minimize the chance of accidents in the future.

If the gas is not to be used at that time then the cylinder valve should be closed and all pressure should be drained to zero in the

regulator and gauge. This should be done any time that the tank is not in actual use. If you have purchased your own cylinder then it is a good idea to also acquire one of the plastic valve plugs, similar to those seen with propane cylinders, in order to protect the cylinder valve threads and keep dust, debris and insects out of the valve.

WARNING: Care should be taken that the cylinder is used and stored in such a way as to minimize the risk of the tank falling over. With the regulator and gauge attached there is an increased likelihood of damage occurring to the cylinder valve should the tank fall. Catastrophic failure of the cylinder valve will turn the tank into a high-energy, unguided rocket with the capability of doing great damage and/or serious injury.

B.2.4 PUTTING IT INTO USE.

Having assembled and tested your gas system, you are now ready to begin the work of packaging your food. You'll need containers, and food grade plastic or Mylar bags that are a bit larger in internal volume than the container. Next is the dry food you intend to package and a pack of matches or a cigarette. You'll also need to wear the safety glasses and hearing protection you wore when you put the gas system together.

Take the containers you are going to use to store your food in, the bags that will line them and the food you are putting up and place them in some warm (not hot) area long enough for them all to equalize to that temperature. This will mean that the air contained inside them will also be at a warm temperature and make it more likely that it will stay on top when the cool gas from the nitrogen cylinder begins to flow in. The warm gas being on top will be the first to purge from the container, taking a good deal of the oxygen with it.

Line the interior of the container with a plastic bag or Mylar bag. Fill the container with the food product shaking to get it as full as possible. Don't forget to add your desiccant package if you're going to use one. You don't want any pockets left between the plastic bag and the container. Once you have gotten it full to just short of not being able to fully put on the lid, gather the top of the plastic bag together or heat seal the edges. If you have sealed it, cut a small corner off of the bag just large enough to allow a probe to enter.

At this point you can either simply flush the bag as described below or draw a vacuum on it first and then flush. If using a vacuum the suction probe should be kept at the top of the bag, just inside of the opening. The gas wand should be inserted to the bottom of the container, taking care not to poke any holes in the liner bag. Once both instruments are inserted, draw the vacuum. When it has reached a satisfactory level, shut of the suction, maintain the seal and turn on the gas.

Open the cylinder valve and set the regulator to a very slow gas flow and begin to fill the bag with gas. You want the container to fill

slowly so you can minimize turbulence and mixing as much as you can. It'll take a little while to fill each container, a few minutes per bucket. Just as with dry ice, the idea here is for the cool gas to displace the warmer atmosphere from the container. The bag should puff just a bit. When I think it's full I'll hold a lit match just above the bag in the air that is escaping from it. If it snuffs right out then I let it run for about several minutes longer to flush out more of any remaining oxygen and remove the wand.

For the most efficient oxygen removal, repeat the suction/gas flushing procedure one more time. When satisfied, tie or heat seal the bag off and seal the bucket. Again, you want to have the bucket as full as possible so that there'll be only minimal air space. You should monitor the containers for an hour or two after filling to check for any signs of bulging or other pressure build up as the cool gas inside gradually warms up and expands. A slight positive pressure is OK, but serious bulging needs some of the pressure released.

NOTE: Although the procedure for flushing a container with nitrogen is straightforward enough, actually getting a good purge of the container is not. Nitrogen flushing works best when the contents of the container are fairly coarse in size so that the gas flow around and through the food is free and unrestricted. Foods such as the larger sized grains (corn, wheat, barley, long grain rice, etc.), legumes and non-powdered dehydrated foods are best suited to this technique. Foods with small particle sizes such as flours, meals, and dry milks will flush with mediocre results.

Because of the difficulties in purging sufficient oxygen from a container to lengthen the shelf life of the food it contains many commercial suppliers have dropped this technique in favor of using oxygen absorbers. There is no reason that inert gas flushing and oxygen absorbers cannot be used together and one good reason that they should. If you are using five gallon plastic buckets as your storage containers, it has been observed that absorbers used in unlined pails can cause the air pressure inside the bucket to drop enough for the walls to buckle, possibly leading to a seal breach or a stack collapsing. For this reason, flushing with inert gas (nitrogen or CO2) might be a good idea, in order to purge as much oxygen as possible so that the pressure drop caused by the absorber removing the remaining oxygen will not cause the bucket to buckle. Liner bags can ameliorate the vacuum problems.

C -- OXYGEN ABSORBERS

C.1 WHAT IS AN OXYGEN ABSORBER?

If all of this messing about with gasses sounds like too much trouble, you can try using oxygen absorption packets. I don't know exactly when they first showed up on the market, but they are a relatively recent food storage tool. The packets absorb free oxygen from the air around them and chemically bind it by oxidizing finely divided iron into iron oxide. This removes it from being available for

other purposes such as oxidative rancidity and respiration by insects, fungi or aerobic bacteria. The practical upshot of all this is that by removing the free oxygen from your storage containers, you can greatly extend the storage life of the foods in the containers.

The absorbers themselves have only a relatively short life span, roughly about six months from the time they were manufactured for the types that do not need external moisture.

Finding any information about these absorbers has been difficult, but, thanks to Al Durtschi, I was able to find a study of their effectiveness from Brigham Young University.

The study tested the absorption capacity of the Ageless Z300E packets made by Mitsubishi Gas-Chemical. It found they were even more effective than their rated absorption capacity of 300 milliliters of oxygen (O2 at sea level pressure). A single packet sealed into an empty #10 can (80% of one gallon) reduced the oxygen in the canned air to less than 1/2%.

The following is the verbatim text of the conclusions section of the Brigham Young study. See V.B Pamphlets for the complete citation of this study.

Conclusions:

> "Oxygen absorbing packets are effective in reducing oxygen contents in sealed cans. The ageless Z300 packet has a greater than claimed capacity for absorbing oxygen. Packets abused by 4 hour-exposure-to-air still exceed claimed capacity. It may be economical to use smaller packets based on the dead air volume instead of can volume. Smaller packets would have less tolerance for abuse and personnel would need to be more diligent in protecting the packets."
>
> "The level of oxygen remaining in the presence of the absorber packets is sufficiently low to greatly retard development of rancidity. The biological consequences are not so easy to predict. Microorganisms range from aerobic to anaerobic, thus no unqualified statement can be made. The energy requirements of anaerobic bacteria are met by reactions between oxygen and more than one other molecule. This makes bacterial energy a higher order of reaction than rancidity. Thus, the rate of bacterial aerobic reaction would be more seriously retarded than rancidity. These matters are not of practical importance because the products to be canned should be too dry to support microbial growth. Insects are aerobic and would like-wise suffer retardation of activity. No comprehensive statement can be made about irreversible inactivation or death of insects. As long as the oxygen level remains low, insect activity will be lower by at least the square root of oxygen content. In a practical sense, these packets are effective in stopping

insect activity. USDA does not recognize any method except disintegration as effective for completely killing insect eggs."

Use of Oxygen Absorbers in Dry Pack Canning

C.2 WHERE CAN I FIND OXYGEN ABSORBERS?

Because they are a relatively new tool on the food preservation and storage market, oxygen absorbers have not yet achieved a widespread dissemination amongst the various storage food dealers and suppliers. They are available, but you may have to do a bit of searching to find them.

The following short list are the suppliers I've located, thus far, who sell them:

WALTON FEED
BEST PRICES STORABLE FOODS
DOUBLE SPRINGS HOMEBREW SUPPLY
NITRO-PAK PREPAREDNESS CENTER
SHERRY'S STOREHOUSE
CSIN
WWW.GLITCHPROOF.COM
COUNTRYSIDE GRANARY

In addition to the above suppliers it may be possible to acquire oxygen absorbers through a LDS family cannery if you have one locally available. *Please see section IV.A.2 for information on how to explore this possibility.*

C.3 HOW ARE OXYGEN ABSORBERS USED?

Even though the Z300E type will apparently absorb a great deal more than the 300 ml of O2 they are rated for, the following instructions for use are based on their listed rating. So, when using the Mitsubishi Ageless Z300E oxygen absorption packets, you should allow one packet for every quart and a half (1430 ml) of remaining air volume in your filled storage containers. The FreshPax D750 from the Multisorb Corporation work with just over 3 quarts (2860ml) of remaining air volume.

Now determining the volume of air remaining in a filled container is no easy thing. In the study, #10 cans filled with either elbow macaroni or powdered milk were used and their respective air volumes were determined. A can full of elbow macaroni was found to contain 22% remaining air volume and a can full of powdered milk was found to contain 10.5%. With these as guides, you should then be able to roughly figure the remaining air volume of the foods you have in your containers. You'll have to decide whether the food you are working is closer to the macaroni or the dry milk in its packing density. Obviously, this is a rather rule of thumb and this is why I kept my instructions to the listed ratings rather than on what they will

apparently really do. The excess capacity will thus serve to cover the shortcomings of your reckonings. These absorption packets should be used only in dry foodstuffs and not with any product that will make them wet or oily.

Your absorbers begin their removal mission the second they come into contact with oxygen, whether it be in your storage container or in the open air waiting to be used. Try to arrange things in such a way as to have your container packed and ready to go before exposing the packets. Take out only those you are going to be able to use up in no more than about fifteen minutes or so else you are losing valuable absorption capacity. When you take them out of their package, spread them out on a tray so they do not contact each other. The oxidation reaction that absorbs the oxygen releases small amounts of heat. The warmer the packet becomes the faster the reaction occurs so you do not want the packets warming each other. Handle each one with tongs, gloved hands or by the edges of the envelope to keep body moisture and skin oils off. Seal the lid or seam of the container as soon as the packets have been inserted.

NOTES:

#1 -- Both Multisorb and Mitsubishi corporations advise that their oxygen absorbers should not be used in a high carbon dioxide environment. I haven't yet been able to determine if this is for reasons of chemical interaction between the CO2 and the oxidation reaction occurring in the absorber.

#2 -- If you do choose to use oxygen absorbers in packing your food storage containers you should give some consideration to the container you're using. The absorber is going be removing the 20% of the atmosphere that oxygen constitutes. Since nothing is replacing it this will leave the interior of the storage container with a lower atmospheric pressure than the outside. If the container is sufficiently sturdy this pressure differential will be of little consequence. For containers with thinner walls or more flexible material the pressure drop could cause them partially collapse or buckle, particularly if other containers are stacked upon them. This could make them more likely to lose seal integrity. Metal cans and glass jars should have no problems. Plastic buckets made of HDPE are poor gas barriers and should have a liner bag of Mylar or other high gas barrier plastic when used with absorbers. Seal the absorbers inside of the liner bag so that the pressure drop with not stress the walls of the container. Other containers should probably be tested or first flushed with an inert gas (N2) before the absorber is sealed in.

#3 -- If the pack of absorbers you need to open contains more than you are going to use up in fifteen minutes or so, you should minimize exposure of the remaining packets. This can be done by heat sealing the bag they came in with an iron after expelling as much air as possible or better yet by vacuum sealing the bag. You can also put the remaining absorbers in as small a jar or metal can as they will fit in and closing with an air tight lid.

#4 -- If absorbers are sealed in a package with desiccants some thought should be given to just how low the relative humidity will be dropped. Silica gel will reduce humidity to approximately 40% which should not interfere with the absorbers oxidation reaction. Other desiccants, however, are capable of reducing relative humidity to very low levels. This might adversely affect your absorber's ability to carry out its mission by removing moisture from the absorber package that is necessary to sustain the oxidation reaction.

D -- DESICCANTS

D.1 WHAT IS A DESICCANT?

Moisture in inappropriate amounts and places is very damaging to the useful life of food. Because of this, much effort is put into reducing the water content of dry foods in order to prolong their shelf lives. Once it is reduced to the desired level the product can then be packaged for storage. Unfortunately, merely reducing moisture content is not always sufficient. Environmental conditions can play a role as well.

There are four mechanisms by which environmental conditions may cause a moisture problem in your food storage:

1. - The air trapped in the container with the food may have held sufficient humidity to raise the moisture content of the food to undesirable levels.

2. - Even if the water vapor content wasn't too high, a falling temperature level may cause the trapped humidity to reach its dew point causing water to be squeezed out of the air to condense on your food much the same way as dew forms on your lawn on cool mornings after a warm, humid night.

3. - The seal of the container may not be sufficiently tight enough to prevent moisture from leaking in.

4. - The packaging material itself may be porous to one degree or another to water vapor. All paper, wood and cardboard has this fault. Depending upon their particular physical properties many plastics do as well. Metal and glass containers have excellent barrier properties though their seals may not.

The solution for moisture problems is multi-faceted. First, make sure the product to be stored is at an appropriate water content for that particular foodstuff. Beans and grains store quite well at a 10% moisture level, but milk powders, dried eggs and dehydrated or freeze dried foods should be lower for best results.

Secondly, try to package your goods in a cool, dry atmosphere and do not allow extreme temperature swings in storage areas. Warm temperatures and high relative humidities when a container is sealed means the air trapped inside the container will have a high dew point.

This will lead to condensation should storage temperatures fall below that dew point. An example of this would be a container sealed on a day that was 70 deg. F and 40% relative humidity. At that temperature the relative humidity would be quite reasonable for all but the most moisture sensitive food. However, should the temperature fall to 44 deg. F the capacity of the air to hold water vapor would have dropped to the point that it could not contain what was sealed in at 77 deg. and the excess would be squeezed out to condense on the food, i.e. - it will get wet. Possibly the food will be able to adsorb this moisture without harm and then again, it may not.

Thirdly, use appropriate packaging materials and make certain it is sealed correctly. If you are going to consume them in four to five years, storing grains, beans and peas in unlined HDPE buckets at normal humidities is fine. If you want to keep them at their best for ten years or more, the plastic the pail is made of is too porous to water vapor for best results and should have an interior liner of a material with better barrier properties. Dry milk powders should not be kept for more than a year in unlined HDPE, but can be kept for much longer in #10 metal cans, glass jars or Mylar bags. Naturally, even the most highly resistant packaging material is useless if its seal isn't good so be sure you use good technique when making closures.

Lastly, you may wish to consider using a desiccant if good humidity control at the time of packing is difficult or if you are not confident of the foods' moisture content or if the storage area is in a high humidity environment or if the packaging material does not have sufficiently high barrier properties.

A desiccant is a substance with very "hygroscopic" properties, meaning it will soak up water vapor from the air surrounding it. A number of different substances are capable of doing this, but only a relative few of them are of practical use and fewer still are going to be readily available to the average person. Before elaborating on the different types that might be useful for our purposes it's necessary to explain how to choose a desiccant.

The U.S. military has done much of the best research on the use of desiccants in packaging and have largely set the standards by which they are judged. Each type of desiccant has temperature and humidity ranges where it performs best and particular physical and chemical characteristics that may need to be considered in relation to what you propose to do with them.

The standard most applicable for what can be done in home food storage defines a unit of desiccant as *the amount of desiccant that will adsorb at least 6 grams of water vapor at 40% relative humidity at 77 deg. F (25 deg. C).*

The following table gives the amount of desiccant necessary per square area for flexible containers such as Mylar bags or per volume of area for rigid containers such five gallon pails or #10 metal cans. The actual weight of a particular desiccant to use will depend upon the adsorbency per unit of desiccant mass.

FLEXIBLE CONTAINERS (Mylar and other plastic bags)			RIGID CONTAINERS (Buckets, cans, jars, etc.)		
		Units of	Volume in:		
Area sq ft	Area sq in	Desiccant Required	Gallons	Cu/FT	Cu/In
0.1	30	1/6	1.1	0.14	237
0.3	45	1/3	2.1	0.28	476
0.6	90	1/2	3.2	0.42	714
1.3	180	1	6.2	0.83	1,428
1.9	270	2	12.5	1.67	2,856
2.5	360	3	18.7	2.50	4,284
3.1	450	4	25.0	3.33	5,712

[Table adapted from "Moisture In Packaging: Selecting the Right Desiccant" (c), Multisorb Corp. http://www.multisorb.com]

In order to maximize surface area to obtain optimal adsorption, desiccants are manufactured in granular or powder forms. This presents a problem of keeping the desiccant, which may not be safe for direct contact with food, out of the product while still allowing sufficient air flow for it to carry out its task. Manufacturers call this "dusting" and deal with it by packaging the adsorbent in materials such as uncoated Tyvek, a spunbonded high-density polyethylene material produced by the Dupont corporation. Unfortunately, I have not yet been able to locate a retail source of uncoated Tyvek, just the coated variety such as is used in postal envelopes. Second best, and what I use, is one or more layers of coffee filter paper securely sealed over the mouth of the container holding the desiccant. I've also made "cartridges" of filter paper for use in narrow necked containers such as two-liter bottles. For this I used ordinary white glue, but getting a good seal all the way around without sealing too much surface area requires some care in execution.

For coarse granular materials tightly woven fabrics might serve the purpose providing the seams were adequate.

D.2 TYPES OF DESICCANTS

D.2.1 SILICA GEL

The most commonly known and used desiccant is silica gel which is a form of silica dioxide (SiO_2), a naturally occurring mineral. It will work from below freezing to past the boiling point of water, but performs best at room temperatures (70-90 deg. F) and high humidity (60-90%). Its performance begins to drop off over 100 deg. F, but will continue to work until approximately 220 deg. F. It will drop the relative humidity in a container down to around 40% at any temperature in its range until it is saturated. Silica gel will absorb up to 40% of

its weight in moisture. It is the only desiccant that is approved by the FDA for direct food use. It recharges easily and does not swell in size as it adsorbs moisture.

In the retail trade, the most commonly found form of silica gel is *indicating silica gel* which are small white crystals looking much like granulated sugar with small pink or blue colored crystals scattered throughout. This is ordinary silica gel with the colored specks being coated with cobalt chloride, a heavy metal salt. When the gel has absorbed approximately eight percent of its weight in water the colored crystals will turn from blue to pink making an easy visual indicator of whether the gel has become saturated with moisture. Because cobalt is a heavy metal, indicating silica gel is not food safe and should be kept from spilling into anything edible.

When saturated, silica gel can be dried out and used again. This is accomplished by heating the crystals in an oven at a temperature of no more than 300 deg. F for approximately three hours or until the crystals turn blue. Dehydrating the desiccant may also be accomplished by heating in a microwave oven. Using a 900 watt oven heat the crystals for three minute intervals until the color change occurs. The exact amount of time necessary will depend upon the oven wattage. Spreading the desiccant in a broad pan in a shallow layer will speed the process Heating to 325 deg. F or more, or by using a microwave oven over 900 watts can damage the gel.

Although I've never found anything that mentions this, apparently it is possible for silica gel to break down over time, or at least the colored crystals can. I had a five pound can stored in an outside shed here in Florida for several years before I opened it again to use some of it. Nearly all of the colored indicator specks had broken down and disappeared. I don't know if the gel itself was still good and with no way to reliably determine whether it was saturated or not, I discarded it. The can the gel was in was just cardboard and it gets very humid here in Florida so it really was very poorly stored. Under decent conditions it may not break down at all. (I've never heard of this occurring, anyway.)

D.2.2 CLAY DESICCANT

Although not typically found for sale on the retail market, clay desiccant is fairly common in commercial and industrial use. The primary reason for this seems to be that it is inexpensive compared to any other form of desiccant.

The material is *Montmorillonite clay*, composed primarily of magnesium aluminum silicate, a naturally occurring mineral. After mining it is purified, reduced to granules and subjected to a controlled dehydration process to increase its sorbent porosity. It recharges easily and does not swell as it adsorbs water vapor. It works well at low and room temperatures, but has a rather low ceiling temperature. At 120 deg. F it will begin to desorb or shed the moisture it has adsorbed. This is an important consideration for storage in hot areas.

Subject to a degree of variability for being a natural material, clay desiccant will adsorb approximately 25% of its weight in water vapor at 77 deg. F and 40% relative humidity.

D.2.3 CALCIUM OXIDE

Also known as "quicklime" or "unslaked lime", calcium oxide is a slow, but strong adsorbent. It is efficient at low humidities and can drop moisture vapor to below 10% relative humidity. Qucklime is *caustic* and must be carefully handled, particularly with regards to dust inhalation and exposure to skin and eyes. It expands as it soaks up water vapor and this must be taken into account when packaging it. It will adsorb up to about 28% of its weight in moisture, but does it slowly over a period of several days rather than a matter of hours like other desiccants. It is most effective when used in high humidity environment where a very low level is desired. It will release a great deal of heat if exposed to direct (liquid) moisture or extreme humidities.

It can be recharged, but I do not have any details on how to go about this other than roasting at fire temperatures.

For expedient use, quicklime can be manufactured from clean, pure lime stone or pickling lime available in the canning sections of many grocery and hardware stores.

D.2.4 CALCIUM SULFATE

Also known as the mineral gypsum and commercially as Drierite, calcium sulfate is another naturally occurring mineral. It is produced by the controlled dehydration of gypsum (CaSO4). It is chemically stable and does not readily release its adsorbed moisture. It has a low adsorbency capacity, only approximately 10% of it weight. It can be regenerated, but apparently not easily so.

For expedient use, gypsum is commonly used in household drywall and Kearny mentions using this source in his Nuclear War Survival Skills.

D.2.5 OTHER DESICCANTS

From: Pyotr Filipivich pyotr@coho.halcyon.com

Simple trick is to dry a piece of wood in the oven and once it is bone dry (more than usual) then put it in your container and seal it. The wood will suck up any available moisture.

Editors note: Wood can soak up to 14% of its weight in moisture, depending on species. Woods with coarse, open grains work the best.

I'm not aware at what temperature it will begin to "desorb" or shed its stored water and it might be fairly low. Some empirical experimentation would be in order before relying heavily on it.

D.3 WHERE DO I FIND DESICCANTS?

I buy indicating silica gel at Wal-Mart in their dry flower section where it is sold in one and five pound cans for flower drying. I've seen it sold the same way in crafts stores and other department type stores that carry flower-arranging supplies. You can also buy it from many other businesses already prepackaged in one form or another to be used as an adsorbent. All of the desiccant that I've found packaged this way has been rather expensive (to me) so shop carefully.

Businesses carrying packaging supplies sometimes also sell desiccants. Some businesses commonly receive packets or bags of desiccants packaged along with the products they receive. I've seen Montmorillonite clay in bags as large as a pound shipped with pianos coming in from Japan. Small packets of silica gel seem to be packed in nearly everything. Naturally, any salvaged or recycled desiccant should be of a type appropriate for use with the product you want to package.

It is possible to make your own desiccants using gypsum from drywall and maybe Plaster of Paris. Calcium oxide can also be produced from limestone (calcium carbonate) or slaked or pickling lime (calcium hydroxide) by roasting to drive off the adsorbed water and carbon dioxide. I don't have any clear instructions, as of yet, on how to go about this. Please do keep in mind that calcium oxide (quicklime) is caustic in nature and is hazardous if handled incorrectly.

D.4 HOW DO I USE DESICCANTS?

Ideally, the dry foodstuffs you have on hand will have no more than a 10% moisture content. If they do not then you will need to reduce moisture to a level appropriate for the kind of food you are storing.

One of the following methods might be of use in lowering moisture content. The least involved is to wait until the driest time of year for your location making sure there is plenty of free air circulation around the food product. If this doesn't suit, then turn your air conditioning on a little high. Bring in your buckets, lids, and the storage food. Let everything sit in a well-ventilated place where it's going to get plenty of cool, dry air from the A/C (avoid anywhere near the kitchen or bathroom areas, as they put out a lot of moisture). Stir the food frequently to maximize moisture loss. About three days of cool, constant air flow and low humidity ought to dry things out a bit. Due to its highly odor absorptive nature, I would not do this with any dried milk products or other powdered foods, flours or meals . This method works best with coarse particles such as grain, legumes and dried foods.

Warm, dry air can also be used to accomplish this and works well if

you have large quantities of grains and legumes. It is very similar to what is used on farms for drying harvested grain. You'll need a source of forced, warm, *not hot*, air. Place the grain in a drum or barrel and blow the heat from the bottom so that the warm and the moisture it will carry can exit from the top. It's important to not let the bottom product get too hot. You should also monitor the top, center of the drum to be certain that the product there is not getting too damp from the moisture escaping from other areas. Stirring occasionally may be necessary. I've seen this done with an old, drum style vacuum cleaner that put off fairly warm exhaust air and it worked pretty well. Do be sure to clean the vacuum so you don't blow the grain full of dust.

If the above methods won't do or you have powdery foods to dry, you can place a large quantity of desiccant in a storage container. Fill the remaining space with your food product and seal on the lid. After about a week, unseal and check the desiccant. If it's saturated, change it out with dry desiccant and reseal. Continue to do this until the contents are sufficiently dry. Calcium oxide will work particularly well for this. If it doesn't become saturated the first time, change it anyway before sealing the bucket permanently. You'd hate to find later it saturated in storage.

If your food products are sufficiently dry you can pack them in storage containers using the packaging method of your choice and have a reasonable expectation of your food staying in good condition. Whether you will need to use a desiccant will be dependent upon the conditions discussed above.

I use indicating silica gel for practically everything. My usual procedure is to save or scrounge clear plastic pill bottles, such as 500ct aspirin bottles or small plastic jars, such as the smaller sizes of peanut butter comes in. Fill the bottle with the desiccant (remember to dry the gel first) and then use a double thickness of coffee filter paper carefully and securely tied around the neck of the bottle to keep any of it from leaking out. The paper is very permeable to moisture so the gel can do its adsorbing, but it's tight enough not to let the crystals out. This way moisture can be safely adsorbed. It won't dry out a lot of moisture -- you still need to take steps to get everything as dry as possible before you pack it -- but it will take care of what little is left.

The above method will also work for the other desiccants, subject to whatever precautions the individual type may have.

IMPORTANT NOTE: The indicating form of silica gel (has small blue or pink specks in it) is not edible so you want to use care when putting together your desiccant package to insure that is does not spill into your food.

E -- DIATOMACEOUS EARTH

E.1 WHAT IS DIATOMACEOUS EARTH?

Diatomaceous earth is a naturally occurring substance comprised of the fossilized remains of marine diatoms. These diatoms are microscopic in size and are covered in sharp spines that make them dangerous to exoskeletal insects, but not to animals with internal skeletons. The spines of the diatom skeletons pierce the soft body tissues of insects between their hard exoskeletal plates and it is through these numerous microscopic wounds that the insect loses bodily moisture to the point of desiccating and dying. Creatures with internal skeletons such as humans, cattle and pets have means of resisting such damage and are not harmed. Thus, it is possible to mix a small amount of DE into your stored grains and beans to control insects without having to remove the dust again before you consume them.

E.2 WHERE DO I FIND D.E. AND WHAT TYPE SHOULD I BUY?

IMPORTANT NOTE: There are actually two kinds of diatomaceous earth to be found on the market and only one of them is suitable for use as an insecticide to use in your stored grains. The kind that you DO NOT WANT FOR FOOD USE is the type sold by swimming pool suppliers as a filtering agent. It has been subjected to a heat treatment that dramatically increases it's silicate content and makes it unsuitable for use with your foodstuffs. The type that you want is sold by a number of suppliers as a garden insecticide. Many organic garden suppliers will carry it. Read the label carefully to be certain no deleterious substances such as chemical pesticides have been added. An appendix with the names and addresses of some DE suppliers may be found in the food and equipment suppliers section.

From: higgins10@aol.com (Higgins10)
Originally posted in: rec.gardens

Good afternoon all. Diatomaceous earth is approved by the USDA as an animal feed additive, however I have found out that there are vast differences between various forms of diatomaceous earth. Some DE products may not be effective in controlling insects, while others may be harmful to humans and pets. The most important differences between individual forms of DE is the shape of the diatom, content of Crystalline Silica, and the purity of the Silica Dioxide. The World Health Organization cautions that DE with a crystalline silica content of three percent or higher is dangerous to humans, (and probably pets and birds as well). Diatomaceous Earth used in swimming pool filters has close to a 60% crystalline silica content. I know of a product called Organic Solutions (insecticide) which is approved by both the EPA and USDA and has a crystalline silica content ranging between 0.36% to 1.12% according to its labels etc. It is classified as Amorphous Fresh Water Diatomaceous Earth (whatever that means). However, all literature I have read assures it is safe for both humans and animals and seems to be very effective at killing insects. I stumbled across all this info. while shopping in the mall. If you're interested in reading it too, go to the Organic Solutions website at http://www.BuyOrgs.com. Hope this

helps answer the question and always use environmentally safe products!
Higgins10

From: kahless@ns.waymark.net
Date: Sat Aug 24 14:08:48 1996
To: Dunross (A.T. Hagan) Private e-mail

[previous text deleted]

I have always purchased DE at the local feed store. It's cheaper there than at the garden and hardware stores. The feed store I buy at has DE available in bulk, but they'll package up a smaller amount if that's what you want. My package in the garage doesn't have a brand name but says "Nitron Industries" at the bottom. The label recommends 7 pounds of DE for each ton of grain. Ha! As if I had "tons" of grain in storage 8-D

I've been using DE for grain storage for about 15 years now but flea control only for the past 6 years. The only fleas we've seen in that period of time is the ones that hitch a ride in with friends pets. A very light dusting afterward takes care of that problem. Miracle stuff as far as I'm concerned since we'd had an awful time with fleas before we started using DE. Much much much cheaper and as far as I'm concerned the advantages FAR outweigh the risks.

Sam
(hope that was helpful)

E.3 HOW DO I USE D.E. IN FOOD STORAGE?

To use, you should mix thoroughly one cup of DE to every forty pounds of grain, grain products or legumes. You need to make certain that every kernel is coated so it is better to do the mixing in small batches where you can insure more even coating.

WARNING: DE is a very powdery kind of dust, so you need to take steps to keep it out of your lungs and eyes. Even whole wheat flour dust can cause lung irritation if you breath enough of it.

DE does not kill the insect eggs or pupae, but it will kill adults and larvae and any eggs or pupae that hatch into adults will die after coming into contact with it.

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-- V --
SHELF LIVES

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"How long will this keep?" This is the defining question of food

storage. Everything you will read in this work evolves from this central question. The length of time a particular food will remain palatable and nutritious in storage determines its usefulness for our purposes. The fact of the matter is that there are few hard and clear answers. As a result it is not uncommon to find two or more sources who purport to know, but that give conflicting data. The following will hopefully cut through some of the fog.

A. "BEST USED", "USE BY" AND OTHER FOOD PRODUCT DATES

Although there are some twenty States in the U.S. that have food product dating laws the Federal government has little regulation concerning food product dating except for infant formulas and some baby foods. It does, however, require that if a manufacturer puts a calendar date on a food product it must also put wording to the effect of "use by" or "best before" next to it to explain what the date means. This is called "open dating" which is to say that it is a plain, easy to read calendar date rather than "closed or coded dating" that must be deciphered. Another date also commonly seen is the "sell by" date. While not as useful for food storage, it does have importance for day-to-day fresh food purchases.

Because the Federal government has so few food product dating standards manufacturers use their own to determine acceptable shelf lives. For the most part, they are based upon changes in texture, appearance, taste and cooking qualities. When a food item begins to exhibit signs of aging that would make it unappealing to customers then it is considered to be at the end of its marketable shelf life. Look for statements such as "use by", "best if used by", "best if used before" or similar wording to find this date. For shelf stable and frozen products it must include both the month, day and year. These dates are useful for determining how long a product can be retained in the storage program before it should be rotated out. When a food begins to undergo taste and appearance degradation the nutrient content will have begun to seriously fade and the time will have come to use it up so it can be replaced with fresh stock. If the product was properly preserved and not subjected to extreme storage conditions it is not unsafe to use after this date. If there is nothing to replace it with it may be kept, but its palatability and nutritive content will just continue to degrade.

Fresh food items such as meat, milk and eggs use a "sell by" date which simply means that the item should not be purchased beyond that date. Products using this date type are only required to use the day and month. Provided that it was properly transported and stored, an item kept past this date is not unsafe to use, but will begin to exhibit signs of aging that will make it unappealing and should be frozen or consumed shortly thereafter.

NOTE: The shelf life of any food, whether indicated with a "use by" or "sell by" date or found on some chart, is predicated upon assumed storage conditions. If the actual storage conditions are different from the assumed storage conditions then the shelf life will

naturally vary. As is explained in *Section I: Time, Temperature, Moisture, Oxygen and Light*, environmental storage conditions have a major impact on the length of time any foodstuff will remain palatable, nutritious and even whether it will remain safe.

As a general rule, when a shelf life is given, it is for conditions of 70 deg. F in a dark, dry location unless stated otherwise. Be sure to read the fine print on any shelf life chart you may come across to see what its values are predicated upon. There are some floating around giving shelf lives of foods in storage temperatures as low as 40 deg. F. At that temperature you would expect to keep your fresh butter, eggs and milk, but very few have the ability to keep any significant amount of canned goods in so cool a storage area.

Regardless of what the date or chart may indicate, if storage conditions have been very poor then a food will become non-nutritious, unpalatable, perhaps even unsafe to eat even if its listed time is not yet up. An example of this would be keeping egg salad at room temperature for several hours at a picnic. The eggs may have been laid yesterday, but you are taking your chances if you eat it. Never put blind faith in any date. Always keep in mind that they are predicated on unspoken assumptions. IF THE CONTAINER IS BULGING, MOLDED, FOUL SMELLING OR SPEWS LIQUID WHEN OPENED, THROW IT OUT! But throw it out safely so that children and animals cannot get into it.

Please see Section III: Spoilage for further information

B. CLOSED DATING CODES USED BY SOME FOOD MANUFACTURERS.

In spite of the fact that increasing numbers of food processing companies are moving to open dating it is not yet universal. For those products that do not come with a plain "best used by" date it is still possible, albeit with much more difficulty, to determine the rotation period for that specific product.

For a processor to move their product in interstate commerce it must exhibit a packing code. This allows them to easily track their product for purposes of stock rotation and in the event of a recall. These packing codes are usually a series of letters and numbers that indicate dates, times, and sometimes places of manufacture. These dates are not "use by" dates, but the time the container was actually filled. As they are not really intended for general public knowledge these codes are frequently unique to a particular processor and are not commonly published by them.

It is possible to get the keys to these codes by contacting the processor and asking how to decipher the dating code for specific product lines. Over time, readers have been doing this and the code keys below are the ones that have been sent to me. Obviously, they are only a few of the many, many products that use closed dating and I hope that future readers will continue to send these codes in as they are gleaned from the processors.

Frankly, when it comes to the potential dozens of products that would require deciphering their packing codes the entire process is a major nuisance. While it is better to have an encoded date than not to have one at all, it would be far better if processors would just use clear open dating and (best used by) so we wouldn't have to carry a book of code keys like covert agents every time we go to the grocery.

Before I list specific manufacturers there is one fairly widely used code key that may be useful. Some processors use a system where all the days of the year are listed 1-365 (366 for leap year) as the first three digits in the code. This number is then followed by a single letter such as "B" and then by a single digit that represents the year.

Some examples of this might be:

Packing code	Date packed
045B97	February 14, 1997
101H98	May 1, 1998
134K96	July 4, 1996
252U98	October 31, 1998

There may be other widely used coding systems yet to be discovered and as they become available I will include them in this work.

SPECIFIC PRODUCT LINES:

IMPORTANT NOTE: I have not personally verified all of these code keys. Also, closed date coding schemes may change over time. For this reason, the code keys given below may not be correct. Be sure to check a number of containers in a product line to verify that a particular code key will work with the product line you are interested in.

ARMOUR STAR CANNED MEAT PRODUCTS

Vienna Sausage, Stew, Chili, Deviled Ham, Potted Meat, Slice Dried Beef, Soups, etc. but does NOT include Armour Star Roast Beef or Corned Beef.

The code is on the bottom of the container. The first letter is the month of production; A=January, B=February, C=March and so on. The following two numbers represent the day of the month it was processed and the third number indicates the year.

Example: A code of B148C23 would be B=Feb, 14 = the fourteenth day, 8=1998. B148C23=February 14, 1998 and the last three characters would be plant or processing line locations.

Armour Star Microwaveable Meals have a two line production code on

the container lid. The second line is the is date and uses the same code as above.

BERTOLLI OLIVE OIL

Packed two years prior to the use by date on the bottle or can.

BUSH BROTHERS & CO.

Baked beans, chili, etc.

A five digit code on the bottom of the can. The first digit is the month, the next two digits is the day of the month, the next number is the year and the last digit is ignored.

Example: A code of 50173 deciphers to be:

5 = the fifth month or May
01 = the first day of May
7 = 1997
3 = last number is discarded.

Thus 50173 is May 1st, 1997.

CAMPBELL SOUPS:

Best by date on cans. Filled exactly two years prior to that date.

DEL MONTE

Canned fruits, vegetables, etc. I'm not sure if it applies to *all* product lines.

A five character packing code, usually on the bottom. The first character is a digit representing the year. The next three characters are digits representing the day of the year the product was packed. The last character is a letter and may be ignored.

Example: A packing code of 8045B deciphers to be:

8 = 1998
045 = The 45th day of the year or February 14th.
B = A plant code.

Thus 8045B is February 14th, 1998.

GENERAL MILLS:

The manufacturing date is coded to their fiscal year that begins on

June 1st and ends on May 31st.

Interpret the code as follows:

The first character of the code is a letter and represents the month the product was made.

The second character in the code is a number which represents the year the product was made.

The following two characters are numbers that represent the day of the month the product was made.

The remaining characters following identify plant location and shift information.

Example: A packing code of E731B would translate as follows:

E = October
7 = 1997
31 = 31st day of the month
B = A plant location

The following is their 12 month cycle. The letter "I" is not used because it can be confused with the number "1".

A = June	E = October	J = February
B = July	F = November	K = March
C = August	G = December	L = April
D = September	H = January	M = May

HANOVER FOODS CORP.

Small whole potatoes, green beans, corn, etc.

A five digit code on the bottom of the can. Omit the first digit. The next digit is the year. The remaining three digits are the day of the year the product was packed.

Example: A code of 28304 deciphers to be:

2 - discard this number
8 = 1998
304 = the 304th day of the year or October 31st

Thus 28304 is October 31st, 1998

HEALTHY CHOICE:

First character is a number, second is a letter with the remaining characters being a lot ID. The number is the year it was packed with the letter being the month, October = A, November = B, December = C,

January = D, and so on through the year. The recommended shelf life is 2 years.

HORMEL PRODUCTS

Their packing code is a letter followed by five numbers. The letter is their plant location and the numbers are the dating code in a MM-DD-Y format.

Example: A code of G07048 decodes to mean:

G = plant location
07 = July
04 = The fourth day of the month
8 = 1998

The can was packed July 4, 1998 at plant location G.

JELL-O BRAND PUDDINGS & GELATINS

The first four digits are the date coding. The first digit is the year and the following three digits is the day of the year.

Example: A packing code of 804522 10:38 deciphers as:

8 = 1998
045 = the 45th day of the year or February 14th
22 = discard the last two digits.
10:38 = the time it was packed.

Thus 804522 10:38 means that box of pudding mix was packed on February 14th, 1998 at 10:38 a.m.

McCORMICK HERBS & SPICES:
(See also http://www.mccormick.com/info/oftenasked.html)

There should be a four digit number of the bottom of the spice package or extract bottle. On foil packages, it will be around the outside edge. This code is more complicated than other manufacturers so read closely.

Example: Using a number 3604 as the packing code:

To derive the year, take the first number and add 5 (3 + 5 = 8) so 1998 is the year of manufacture.

To derive the month and day, divide the last three digits by 50 (604 ÷ 50 = 6 with 4 remaining). The six indicates the last whole or complete month before the month of production, January, February, March, April, May, and then June. The next month, July, is the production month. The 4 remaining is the day it was produced.

Therefore a packing code of 3604 means that product was packed July 4, 1998.

While not as precise, you can save considerable time by just finding the year. The last three digits representing the day and month will increase as the year grows.

PROGRESSO FOODS

Canned soups, beans, etc.

Two lines of code on top of the can. The top line, the first two characters are the date portion. The first character is a letter indicating the month and the second character is a digit indicating the year.

Example: A packing code of L7N18 1211 (this is the first line) would be:

L = 12th month or December
7 = 1997
N18 = ignored
1211= ignored.

Thus a packing code of L7N18 1211 indicates the can was packed in December of 1997.

C. SHELF LIVES OF SOME COMMON STORAGE FOODS.

The chart given below has been adapted from a number of different shelf-life charts published by the cooperative extension services of several states. It presupposes no special packagings other than the way the food comes from the store. The general assumption is that when a given foods' taste, appearance or texture begin to take on noticeable changes it has reached the end of its best marketable shelf life and should be rotated out. This is not to say the food is no longer edible, but it is losing nutritional content at the same time so no purpose is served by keeping it for longer than is necessary to replace it with fresher stock. For what it's worth, I'm not fully in agreement with it myself, but it's a good working hypothesis and I modify it by my personal experience which may vary from yours. If it is a dry food then only dry utensils should be used to remove it from its container. The less light, moisture, heat and oxygen it comes into contact with, the longer the food will keep.

All of the below are for new, unopened containers.

FOOD	RECOMMENDED STORAGE TIME AT 70 deg. F.	STORAGE

TIPS		Keep the product:
Baking powder	Till can date	Sealed & bone dry
Baking soda	2 years	Sealed & bone dry
Biscuit, brownie, muffin mix	9 months	Sealed, cool and dry
Bouillon, cubes or granules	2 years	Sealed, cool and dry
Cake mixes, regular	9 months	Sealed, cool and dry
angel food	1 year	Sealed, cool and dry
Canned food, metal can, non-acidic	2 years	Cool
metal can, acidic	12-18 months	Cool
glass jars	2-3 years	Dark and cool
Chocolate, semi-sweet or unsweetened	18 months	Cool and dark
Chocolate syrup	2 years	Cool & tightly sealed
Cocoa, powder or mixes	8 months	Sealed and cool
Coffee, regular	2 years	Cool, dry and sealed
instant	1-2 years	Sealed
Coffee creamers, powdered	9 months	Sealed and cool
Cornmeal	1 year	Guard against weevils
Cornstarch	18 months	Dry
Crackers	3 months	Dry
Flour, white	8-12 months	Guard against weevils
whole wheat	6-8 months	Cool and weevil proof
Frostings, canned	3 months	Cool
mix	8 months	Dry and cool
Fruits, dried	6-12 months	Cool & sealed
Gelatin, all types	18 months	Protect from moisture
Grains, whole	2 years	Dry and weevil proof
Hominy & hominy grits	1 year	Guard against weevils
Honey	1 year	Sealed
Jellies, jams, preserves	1 year	Refrigerate after use
Molasses & syrups	1 year	Sealed
Mayonnaise	6 months	Refrigerate after use
Milk, condensed or evaporated	1 year	Turn over every 2 mos
Non-fat dry	6 months	Bone dry and cool
Nuts, vacuum canned	1 year	Cool and dark
other packaging	3 months	Cool and dark
in shell	4 months	Cool, dry and dark
Pancake mix	6-9 months	Dry and weevil proof
Pastas (macaroni, noodles, etc)	2 years	Guard against weevils
Peanut butter	6-9 months	Sealed, cool, dark
Peas and beans, dry (not soybeans)	2 years	Dry and weevil proof
Potatoes, instant	6-12 months	Dry and weevil proof
Pudding mixes	1 year	Cool and very dry
Rice, white	2+ years	Guard against weevils
brown	3-6 months	Cool and weevil proof
flavored or herb	6 months	Sealed & weevil proof
Salad dressings	10-12 months	Refrigerate after use
Salad oils	6 months	Sealed, dark and cool
Sauce and gravy mixes	6-12 months	Cool and dry

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Shortening, solid.............1 year..........Dark
Soup mixes....................1 year..........Cool and dry
Sugar, brown..................6 months.........Airtight container
       confectioners...........18 months.........Dry and sealed
       granulated..............2+years..........Dry
Syrups (corn syrup based).....8-12 months.......Sealed and cool
Tea, bags.....................18 months.........Sealed and dry
     instant..................3 years..........Sealed
     loose....................2 years..........Sealed and dry
Vegetables, dried.............1 year..........Cool and sealed
Vinegar.......................2+ years.........Sealed
Yeast (dry)..............Pkg expiration date....Cool and dry
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-- VI --

RESOURCES

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[This FAQ does not tell me what I need to know!]

Please put the question to the *rec.food.preserving*, *rec.food.cooking*,*misc.survivalism*, *alt.survival* or *misc.rural* Usenet newsgroups. You could even resort to the tried and true method, a book.

The following is a list of books that I have found to have useful information. It is by no means an exhaustive list on the subject. If you have books you would like to suggest, please feel free to e-mail me with the particulars. If you can please include the same kind of information about the book in question as you see below, particularly the ISBN #, if it has one.

A. BOOKS:

A YEAR'S SUPPLY; Barry G. & Lynette B. Crockett; 1988; ISBN# 0-915131-88-9; Available form the author at P.O. Box 1601, Orem, Utah 84057 and available in some stores. Publisher's Press.

BOOK OF TOFU, THE; William Shurtleff & Akiko Aoyagi; 1975; ISBN#0-345-35181-9; Ballantine Books.

BUILD YOUR ARK! Book 1: Food Self-Sufficiency; Geri Guidetti; 1996; ISBN# 0-938928-01-5; Published by the author; The Ark Institute, P.O. Box 142, Oxford, Ohio 45056; http://www.arkinstitute.com; E-mail to arkinst@concentric.net

COOKIN' WITH POWDERED MILK and COOKIN' WITH POWDERED EGGS; Peggy Layton; Both 1994; No ISBN; Available from the author P.O. Box 44, Manti, Utah, 84682.

COOKIN' WITH HOME STORAGE; Vicki Tate; 1993; ISBN# none; Published by the author; Address: 302 East 200 North, Manti, Utah, 84642; Tel # (801)

835-8283

COUNTRY BEANS; Rita Bingham; 1996; ISBN 1-882314-10-7; Published by Natural Meals In Minutes 30500 SE Jackson Rd, Gresham, OR 97080.

CREATING THE COMPLETE FOOD STORAGE PROGRAM; Skipper Clark; 1996; No ISBN; Available from the author, Sierra Sun Publishing, P.O. Box 6209, Oroville, CA 95966

HOME FOOD SYSTEMS; Edited by Roger B. Yepsen, Jr.; 1981; ISBN# 0-87857-325-9; Rodale Press.

HOW TO DEVELOP A LOW-COST FAMILY FOOD-STORAGE SYSTEM; Anita Evangelista; 1995; ISBN 1-55950-130-8; Loompanics Unlimited.

HOW TO DRY FOODS; Deanna DeLong; 1992; ISBN 1-55788-050-6; HP Books

KEEPING FOOD FRESH; Janet Bailey; 1985; ISBN# 0-385-27675-3; Doubleday & Co.

KEEPING THE HARVEST; Chioffi and Mead; 1991; ISBN# 0-88266-650-9; Storey Communications.

LIVING WELL ON WHEAT; Geri Guidetti; 1997; ISBN 0-938928-02-3; Published by the author; The Ark Institute, P.O. Box 142, Oxford, Ohio 45056; http://www.arkinstitute.com ; E-mail arkinst@concentric.net

MAKING THE BEST OF BASICS - FAMILY PREPAREDNESS HANDBOOK; James T. Stevens; 1996; ISBN #1-882723-25-2; Gold Leaf Press or from the author: 15123 Little Wren Lane, San Antonio, TX 78255; E-mail jstevens@iamerica.net

MARLENE'S MAGIC WITH FOOD STORAGE; Marlene Petersen; 1991; No ISBN; Published by the author; Marlene's Magic, 4958 Alpine Circle Highland, Utah 84003

NUTRIENT CONTENT OF THE U.S. FOOD SUPPLY, 1909-1988; 1992; Nutrient Education Division; Human Nutrition Information Service of the USDA.

NUTRITIVE VALUE OF AMERICAN FOODS; Catherine S. Adams; 1975; No ISBN; USDA Handbook No. 456

PERMACULTURE BOOK OF FERMENT & HUMAN NUTRITION, THE; Bill Mollison; 1993; ISBN 0-908228-06-6; Tagari Publications

PUTTING FOOD BY; Greene, Hertzberg and Vaughn; 1982 (14th edition); ISBN# 0-525-93342-5; Penguin Group.

RECOMMENDED DIETARY ALLOWANCES (The RDA Book); National Research Council; 1989(10th edition); ISBN 0-309-046335 (paper); National Academy Press

ROOT CELLARING (1994); Mike and Nancy Bubel; ISBN 0-88266-703-3.

TOFU & SOYFOODS COOKERY; Peter Golbitz; 1998; ISBN 1-57067-050-1; Book Publishing Company; P.O. Box 99, Summertown, TN 38483

WHOLE GRAINS; Sara Pitzer; 1981; ISBN #0-88266-251-1; Garden Way Books

B. PAMPHLETS:

Consumer Information Center, Department EE, Pueblo CO 81009. Ask for the Consumer Mailing List Catalog. You can order those nifty USDA pamphlets from this catalog.

Check your extension service office for pamphlets, which can usually be bought for a dollar or so. Especially important for high altitude canning, getting recipes specific for locale, even information on U-Pick sites and local farmers' markets.

Controlling Indianmeal Moths in Stored Shelled Corn and Soybeans; Phil Harein and Bh. Subramanyam; FS-0996-A-GO Revised 1990 Minnesota Extension Service, University of Minnesota

FOOD STOCKPILING FOR EMERGENCY SHELTERS; Food and Materials Division, Commodity Stabilization Service, USDA, April 1961]

Food Storage In The Home FN502; Utah State University Cooperative Extension Service Bulletin

Frequently Asked Food Questions FN 250; 1993 Utah State University Cooperative Extension Service Bulletin

Molds And Mycotoxins In Feeds; C.M. Christensen, C.J. Mirocha, R.A. Meronuck; FO-3538-C-GO 1988; Minnesota Extension Service, University of Minnesota

Molds In Grain Storage; Richard A. Meronuck; FO-0564-C-GO; Revised 1987; Minnesota Extension Service, University of Minnesota

Nonfat Dry Milk FN142; Utah State University Cooperative Extension Service Bulletin

Use of Oxygen Absorbers in Dry Pack Canning; Albert E. Purcell, Theodore C. Barber, John Hal Johnson; Benson Quality Assurance Laboratory Department of Food Science, Brigham Young University

C. MAGAZINES:

American Survival Guide
P.O. Box 68033
Anaheim, CA 92817-0833
(714) 693-1866

Backwoods Home Magazine. Dave Duffy, publisher.
P.O. Box 712

Gold Beach, OR 97444
(541) 247-8900
http://www.backwoodshome.com

Countryside & Small Stock Journal
N2601 Winter Sports Rd,
Withee, Wisconsin 54498
(800) 551-5691

Mother Earth News
P.O. Box 56302
Boulder, CO 80322-6302
(303) 678-0439

D. PHONE: (non-modem)

Your local cooperative extension service--check your local university directory, especially if its a Land Grant College; look under Government Services, under Dept. of Agriculture. Master Preservers--similar to Master Gardeners or Master Composters.

E. ELECTRONIC:

E.1 INFORMATION SOURCES

ftp://ftp.ucdavis.edu/pub/extension/4h-youth/fp001.zip-fp008.zip

Files are compressed, written in Word Perfect 5.1 or Post Script format. Files are eight lessons in food preservation.

ftp://ftp.michvhf.com/pub/rec.food.baking/FAQ

The FAQ for the *rec.food.baking* news group. Good stuff.

http://waltonfeed.com/self/default.htm

The Walton Feed information area on food production, preservation, and storage, water storage and purification, nutrition, planning, culture and a great deal of other useful information. One area also has the labels showing contents, nutritional breakdowns and other information of most of the products produced and/or sold by Walton Feed. Also listed are head gas analyses of their packaged products. He has a good section on do it yourself food storage packaging as well.

http://www.idos.com

This is the home of The International Dutch Oven Society. There's more here about how to use Dutch ovens to cook more foods than you ever thought about. Also a lot of good links, including Macscouter, a Boy Scout site with a lot of open fire cooking information.

http://www.nyx.net/~dgreenw/sourdoughfaqs.html

A truly vast collection of information, recipes and tips on sourdough breads of every sort and some really interesting links. The *rec.food.sourdough FAQs* may be found here as well.

http://sunsite.unc.edu/hermed

A collection of FAQs and other assorted information and pictures of culinary and medicinal herbs.

http://www.geocities.com/Heartland/Acres/1962/rffl.html

The *rec.food.preserving* FAQ. This work and mine are yin and yang to each other. What I don't cover, Leslie does and vice-versa. Unfortunately, there isn't a good way to get a plain ASCII text version and it hasn't been updated in a while, but it's still chock full of solid, useful information.

http://www.disasterrelief.org/library/prepare

The library of the Disaster Relief Organization. Some really good preparedness information.

http://www.fema.gov/library/emfdwtr.htm		Emergency Food & Water
	/famplan.htm	Your Family Disaster Plan
	/diskit.htm	Your Family Disaster Supplies Kit

Three of the many files available on the Federal Emergency Management Agency web site. There's also correspondence classes on a wide range of subjects available, most of them for free. You should also check out the Community Emergency Response Team materials available. There's a tremendous amount of resources and knowledge available here and you've already paid for it, *so use it*.

http://cypress.idir.net/~medintz/surv_faq/surv_faq_index.html

Mike Medintz's web site and it contains the FAQs native to the misc.survivalism newsgroup. Particularly look for the *Threat Assessment FAQ* by Richard DeCastro and the *Water Treatment FAQ* by Patton Turner.

http://www.millennium-ark.net/News_Files/Hollys.html
http://www.ballarat.net.au/~standeyo/News_Files/Hollys.html

These two sites in the States and Australia mirror each other. Created by Holly and Stan Deyo, they offer a great deal of useful food storage information, software, water purification and storage and more. Well worth a look.

http://www.flashnet/~bhphiker/BHP/

The Back Country homepage. All sorts of knowledge relating to the

back country. Click on the "distilled wisdom" link to get to the *rec.backcountry* newsgroup FAQs. One of the most important ones there is the *water treatment FAQ*. It makes a fine complement to Pat Turner's water treatment FAQ.

http://www.homecanning.com

The Bernardin (Altrista) web site. Wet-pack pressure and boiling-water bath canning information.

http://www.danonenewsletter.fr/indexangl.html

This is not Dannon, but Danone, the French yogurt maker. The site has a great deal of information on fermented milk products. It's in English, but French is available as well.

http://countrylife.net

A village of high quality food information about edible wild plants, herbs, grain, milling, baking, fermented milk products and more.

http://www.managingdesire.org/Hesperian/Hesperian.html

Nothing to do with food at all, but a page for ordering the various publications of the Hesperian Foundation, such as *Where There Is No Doctor*, *Where There Is No Dentist* and *A Handbook For Midwives*. In many situations where you might have to seriously rely upon your food storage program these books could surpass the value of their weight in gold. Think seriously about getting them.

http://www.hollowtop.com/finl_html/finl.html

The Food Insects Newsletter site. Just in case you think you'll ever have to.

E.2 SOFTWARE SOURCES

[I have not used any of these programs myself, but I'm listing them for those who might be interested - editor]

http://www.waltonfeed.com/grain/calc.html

There are two Excel spreadsheets here that can also be imported into Lotus 123, Quattropro or Works For Windows. The first spreadsheet is a nutritional calculator showing the breakdown of 65 nutrients for 167 foods with more being importable. The second spread sheet is a yearly supply calculator.

http://waltonfeed.com/self/plan.html

A nutritional calculator that allows you to enter your food supply and it gives you a daily nutritional printout. This is a smaller, less versatile version of the one from Revelar below, but is less

resource intensive and will run on a DOS only machine.

http://www.revelar.com/fsp.html

A more extensive, versatile version of the above program, makes it much easier to modify for personal use. It also requires at least a 486, Windows and 8mb of Ram. A version for the Mac is available as well.

http://www.beprepared.com (click on free software area)

Offered on the Emergency Essentials web site. The first program is a food planner demo for creating shopping lists and planning recipes for any length of time. The second is a 72 hour preparedness program that will take you through various disasters and how to prepare for them.

http://www.millennium-ark.net/News_Files/Hollys.html
http://www.ballarat.net.au/~standeyo/News_Files/Hollys.html

The U.S. and Australian web sites for Holly and Stan Deyo. They offer food storage calculators similar to the one from Revelar, but with more food items already built in.

F. ORGANIZATIONS

F.1 THE CHURCH OF JESUS CHRIST OF LATTER DAY SAINTS

The LDS church, commonly known as the Mormon Church, has long had a welfare program for the benefit of its members in need. Believing that the best way to deal with the problem of needy members is not to have any, the church also strongly encourages its membership to be as self-reliant and self-dependent as possible. To further this end it provides access to church owned cannery facilities and makes large, economical bulk purchases of storage foods to sell at cost to any member with an interest in starting a personal food storage program. Believing that the more self-dependent people there are in general the fewer there will be needy in times of hardship the LDS church also makes those same facilities and supplies accessible to non-church members, or "gentiles", as well.

Most facilities will be located at one of the LDS Bishop's Storehouses located in various places around the country, but some churches will also have their own local facilities. The easiest means of finding out is simply to ask the LDS church member you know. If they don't themselves know, or you don't know any Mormons then a little phone book research will be necessary. Find your nearest local Mormon church and ask about speaking with the local Bishop of the Ward or Relief Society president. Either one of those two individuals will be able to give you the information you seek. Failing any of the above, you can also call the LDS church headquarters in Salt Lake City at 1-800-453-3860 extension 4164.

Or you can write to:

The Church of Jesus Christ
of Latter-Day Saints
Welfare Services
Seventh Floor
50 East North Temple Street
Salt Lake City, Utah 84150

If you find that you have a cannery within striking distance then give them a call. Inquire about available times, what you need to provide and what is not suitable for canning. Be up front and honest with them, they're sincere about allowing non-church members to use their facilities. You'll hardly be the first one to want to talk to them about food storage. Ask for a copy of the cannery guidelines and a price list of what is available. There may also be classes or seminars available. There is a certain degree of variability between the canneries so what is available at one may not be at another.

I've corresponded with many LDS members and have even contacted the LDS headquarters in Salt Lake City to get the official word. Keeping in mind that not every area may have facilities for use and that the family canneries are run by volunteers, they are quite earnest about allowing non-church members to use their facilities. It's worth investigating.

IMPORTANT NOTE: Please do keep in mind that the individuals responsible for the family canneries are all *volunteers* with demands on their time from many areas. Be courteous when speaking with them and, if there are facilities for use, flexible in making arrangements to use them. You will, of course, have to pay for the supplies that you use, cans and lids at the least, and any food products you get from them. With the onset of the millennium the LDS family cannery volunteers are becoming quite busy so be prepared to have to work with their available scheduling. As a general rule they cannot put your food in storage for you. Be ready to pay for your purchases in advance, if necessary. They do not take credit cards and probably cannot make change so take a check along.

Any food products you want to have sealed in cans will need to fall within their guidelines of suitability for that type of packaging. This is for reasons of spoilage control since many types of foods just aren't suitable for just sealing in a container without further processing. If you purchase food products from them, they will already be within those guidelines. A brief treatment of these guidelines may be found below.

F.1.1 LDS FAMILY CANNERY GUIDELINES

Subject to some variability, the following foods are generally available at the canneries:

Apple slices, dried	Macaroni	Rice, white
Beans, pinto, pink, great Northern	Milk, non-fat dry	Soup mix
	Oats, quick rolled	Spaghetti

Carrots, dry	Onions, dry	Sugar, white
Cocoa, hot mix	Pudding mix	Wheat berries
Flour, white	(chocolate & vanilla)	(hard red winter)
Fruit drink mix		

You will be able to purchase the necessary cans, oxygen absorbers, boxes and plastic lids for what you want to can.

The following food items are not thought to store well when dry pack canned and generally cannot be put up at the cannery:

Baked goods	Egg noodles	Peanut butter
Baking powder	Flour, whole wheat	Rice, brown
or soda	Granolas	Spices
Barley, pearled	Honey	Sugar, brown
Cereal, milled grain	Mixes, if they contain	Yeast
Coconut	leavening agents	
Cornmeal	Nuts, roasted or raw	
Dried meats	Oils or fats	

Although I am not in complete agreement with the above list, it is workable and will get the job done. Make sure that the food you want to pack has little fat content and strive to make sure it has a low moisture content and you should be OK. For grains, legumes, flours, meals and dried fruits and vegetables do make sure to use the oxygen absorbers. You should not assume the food is insect free. When the packets remove the available oxygen any insect life in the can will either die or at least go into stasis.

G. FOOD AND EQUIPMENT SUPPLIERS

G.1 MAIL ORDERING STORAGE FOODS -- WHAT YOU SHOULD KNOW

When it comes to building a food storage program, sooner or later you may want to seriously consider mail ordering at least a part of the foods you want. Even for those of us who try do as much as we can locally there are some things which are not going to be easily available in our areas. To help with this I have included below a list of food and equipment suppliers where just about anything can be found.

Because many do find it necessary or desirable to purchase through mail order I am including a few points which should be considered before shelling out the cash.

1.-- Find out how much the shipping costs are going to be. Grains and legumes are relatively cheap, but weigh a lot when bought by the five or six gallon-bucket. Because of this, shipping charges can sometimes as much as double the actual cost of the product by the time you get it to your door. Adding insult to injury is the $2.00 per round bucket fee UPS is charging. Compare carefully each company's list price and their shipping charges, combined, when deciding who to order from. Saving up for a larger order, or trying to find someone to combine

orders with might enable you to make a large enough order to get a price break on shipping. You could also take a vacation in the area of the company's location or swing through the area on the way back from one. If you choose to do this, be certain to call ahead and let them know so they'll have your order ready and waiting for you. The company in the next state may be higher on the list price, but end up being cheaper than having it shipped in from six states away.

2.-- Ask the supplier when your order is going to ship. Some suppliers are way behind in order filling and you could be waiting and waiting. Slowness in shipping is not necessarily a sign of bad business. Some suppliers may drag their feet, but others may be genuinely swamped by the volume of business they are receiving because they have a good product at a fair price. The closer we come to the millennium the worse this problem is going to become.

3.-- How fresh is the product you are ordering? Freshness is what it's all about when it comes to storage foods. If a food has a five year shelf life in its container then you want as much of those five years to be on your shelf, not the supplier's.

4.-- Be very clear as to how the product you are ordering is packed. Many suppliers offer identical foods packed in several different ways. Be certain the product number you are giving the salesperson is for the product packed in the manner in which you want it.

5.-- What is the head gas analysis? If you are ordering foods packed in a nitrogen flushed oxygen free container (with or without an oxygen absorber packet added) then ask about the laboratory test results that measure the oxygen content of the head gasses in the container. This is of great importance if you are counting on the extra storage life such packaging will give you. There are but a few companies such as Perma Pak, Ready Reserve, and Walton Feed that actually produce packaged storage foods and most dealers only distribute and retail their products. If the dealer can not produce the manufacturer's test data measuring the head gasses of the products they are selling then keep looking.

6.-- If you are purchasing wheat and intend to use it primarily for bread making then be sure to ask about its protein content. The best breads need at least 12% protein and the higher the better. Also take a close look at the weight of the product. One company's five or six gallon bucket of wheat may not weigh the same as another's. The same applies to dehydrated foods such as fruits, vegetables, TVP, etc. Ask about the moisture content of bulk foods which are not already packaged for long term storage. 10% moisture is where you want to be for grains, legumes and most everything else.

7.-- What is the company's damage and return policy? If your carefully packed SuperPails and #10 cans get dented or cracked in shipping you'll need to have them replaced. Most mail order companies will require you to contact the shipper (such as UPS) for a claim number. The shipper may or may not require an inspection so don't

destroy any packaging or containers until you know for sure.

Does anyone else know of anything else a person should look out for or ask about when mail ordering storage food?

G.2 ADDRESSES OF SUPPLIERS

DISCLAIMER: The addresses listed below were either found by me or sent to me by the business owners or interested readers. I make *NO* representation as to their worthiness to do business with. Most of these merchants or manufacturers have been in their field for many years and will be around for many more and are honorable in their dealings. However, there are some businesses that spring up and then disappear and with every update of this work there is at least one or two that I cannot locate from the previous update. The advent of the World Wide Web has only exacerbated this problem. In addition to the precautions mentioned in G.1 above you should take all of the usual precautions in mail or phone ordering.

I have accumulated the following list of names and addresses of various suppliers of one thing or another relating to food preservation and storage. They are roughly categorized by type:

STORAGE FOOD MANUFACTURERS: The actual producers or packagers of storage foods. Some also do retail sales of their products, but most do not.

FOOD PRESERVATION DEALERS AND SUPPLIERS: These are businesses dealing with the aspects of food preservation as opposed to storage. Canning, meat curing, fermented milks, pickling, spices, soybean products, brewing, vintning, etc.

FOOD STORAGE AND PRESERVATION EQUIPMENT MANUFACTURERS: The actual manufacturers of equipment. Some will do retail sales and some do not.

DIATOMACEOUS EARTH MANUFACTURERS AND DEALERS: Self-explanatory.

STORAGE FOOD RETAIL DEALERS: Retail sales of all of the above.

Naturally, addresses, phone numbers, web sites, etc change over time so if you have more current information than I'm giving here, please be so kind as to let me know. Additionally, I'm always looking for new companies so if you have some that I don't have I'd like to see those too. Thanks - ed.

G.2.1. STORAGE FOODS MANUFACTURERS

ALPINEAIRE FOODS
Post Office Box 926
Nevada City, California 95959
(800) 322-6325
(916) 272-2624 fax

http://www.alpineairefoods.com/
E-mail: sales@alpineairefoods.com

Storage food manufacturer. Shelf stable foods with a long storage life. Many foods that require no cooking. Also backpacking meals. No retail sales. See suppliers list for retail dealers.

FREEZE DRY FOODS, LIMITED
579 Speer Rd
Oakville, Ontario L6K 264 Canada
(905) 844-1471
(905) 844-8140 fax
http://www.freeze-dry.com
E-mail: info@freeze-dry.com

A Canadian freeze-dried foods manufacturer. Produces Hardee Camping Foods. List of dealers on site. No retail sales.

HARVEST FOODWORKS
445 HWY 29
RR#1
Toledo, Ontario KOE 1YO, Canada
(800) 268-4268
(613) 275-2218
(613) 275-1359 (fax)
http://www.harvest.on.ca
e-mail: thefolks@harvest.on.ca

A Canadian producer of primarily vegetarian (some have meats) dehydrated and freeze dried foods. No retail sales, but a links page gives location of dealers. Ingredients and nutrition information on site.

OREGON FREEZE DRY, INC (Mountain House)
P.O. Box 1048
Albany, OR   97321
(800) 547-0244
(541) 967-6527 fax
(541) 926-6001 international
http://www.ofd.com/mh/index.html
E-mail: mtnhouse@ofd.com

Manufacturer of Mountain House freeze dried foods in pouches and larger cans. Does not sell direct, but through distributors. A list of dealers and stocking stores on site.

PERMA-PAK
3999 S. Main St., Suite #S-2
Salt Lake City, UT   84107
(800) 594-8974
(801) 268-3913
(801) 268-4376 fax
http://permapak.com

A major producer of storage foods. No retail sales. See retail

suppliers list for dealers.

READY RESERVE FOODS
Post Office Box 697
1442 S. Gage
Beaumont, California 92408
(800) 453-2202

Over 100 different dry food products for long term storage. No retail sales. Contact company for a list of dealers.

SOPAKCO
P.O. Box 1129
215 South Mullins St
Mullins, South Carolina 29574
(800) 276-9678
(888) 276-9678
(803) 464-0121
(803) 464-2178 fax
http://www.sopakco.com

Manufacturer of military MRE's, their civilian MRE equivalent brand *Camp & Trail* and humanitarian pouch meals. Some product info on site. No retail sales, but does have dealer contact info.

STAR FOOD PROCESSING, INC.
3444 East Commerce Street
San Antonio, Texas 78220
(800) 882-MEAL

RETAIL SALES. Fully cooked heat & eat serving trays. Each tray contains 106 ounces of fully cooked, ready to eat products. Thirty minutes time required to prepare a meal from pantry to the table. This product is shelf stable and requires no refrigeration or freezing for storage. Normal shelf life is two years.

WALTON FEED,INC
135 North 10th
P.O. Box 307
Montpelier, ID 83254
(800) 269-8563
http://www.waltonfeed.com

RETAIL SALES. Major manufacturer and supplier of storage foods. Bulk & N2 packed dehydrated foods, grains/legumes bulk and N2 packed, oxygen absorbers. Free food storage planning software. Can labels and head gas analyses of most products available for viewing on site. Very informative web site.

WORNICK COMPANY, THE (formerly Right Away Foods and Shelf Stable Foods)
200 North First Street
McAllen, TX 78501
(800) 565-4147 (Mil-Spec orders)
(210) 687-9401

(210) 687-7028 fax
http://www.wornick.com

Manufacturer of military MRE's, their civilian MRE equivalent brand *Mil-Spec* and humanitarian pouch meals. Good information on military and civilian MRE's on their site. No retail sales.

G.2.2 FOOD PRESERVATION DEALERS AND SUPPLIERS

Canning, meat curing, food drying, spices, pickling, cultured milk products, soybean products, etc.

ALLIED-KENCO SALES
26 Lyerly St.
Houston, Texas 77022
(800) 356-5189
(713) 691-2935
(713) 691-3250 fax
http://www.alliedkenco.com
E-mail: alliedkenco@msn.com

A butcher supply house specializing in sausage and jerky making supplies and equipment. Seasoning, sausage casings, meat grinders, sausage stuffers, commercial vacuum sealing machines and more.

CON YEAGER SPICE COMPANY
144 Magill Rd
Zelienople, PA 16063
(800) 222-2460
(412) 452-6171
http://www.nauticom.net/w-pa/yeager.htm
E-mail: bkrever@fyi.net

Meat curing, smoking, herbs and spices. Bulk sales.

COOKBOOK SHOPPE, THE
Vickie Tate
302 East 200 North
Manti, Utah 84642
(801) 835-8283

Home Storage & Preparedness Books including Cooking With Home Storage.

CUMBERLAND GENERAL STORE
#1 Highway 68
Crossville, TN 38555
(800) 334-4640
(931) 456-1211 fax
http://www.cumberlandgeneral.com

The rival to Lehman's Hardware. A good deal of food preservation and storage equipment with the emphasis on non-modern gear. Can sealers, grain mills, water pumps and a great deal of other non-electrically

powered equipment.

DOUBLE SPRINGS HOMEBREW SUPPLY
4697 Double Springs Rd.
Valley Springs, CA 95252
(888) 499-2739
(209) 754-4888
http://www.doublesprings.com/
E-mail: homebrew@GOLDRUSH.com

Home brewing and vintning supplies of all sorts. May have oxygen absorbers. Preservative chemicals. Many books, including vinegar making. Vinegar mothers. A lot of equipment.

GEM CULTURES
30301 Sherwood Rd.
Ft Bragg, CA 95437
(707) 964-2922 (mornings are best time to call, Pacific time)

Fermented food starter cultures such as natto, tempeh, amazake, miso, shoyu, tamari, koji, miso, sourdough and other bread leavens (barm, etc.), fil mjolk, viili, and kefir grains. Also natural nigari (bitterns) and calcium sulfate (gypsum) as well as a form box for tofu making.

HOME CANNING SUPPLY & SPECIALTIES
P. O. Box 1158
(1815 LaBraya St.)
Ramona, CA 92065
(619) 788-0520 (phone)
(619) 789-4745 (fax)
(800) 354-4070 (orders only)

Home canning and food preservation supplies such as bulk pectin. They offer regular pectin, low-methoxyl pectin without preservatives, and low-meth pectin with preservatives.

KOCH SUPPLIES
1411 West 29th St
Kansas City, Missouri   64108
(800) 456-5624
(816) 753-2150
(816) 561-3286 fax
http://www.kochsupplies.com
E-mail: koch@kochsupplies.com

Primarily wholesale dealer in meat curing, smoking and sausage making supplies.

LEHMAN'S HARDWARE
P.O. Box 41
Kidron, OH   44636
(330) 857-5757
http://lehmans.com

E-mail: getinfo@lehmans.com

Not a great deal of food, but a lot of food related equipment, grain mills, can sealers, water pumps, butchering, cheese making, dehydrators, pitters, peelers, etc. Most of it non-electric. Many books. Free shipping on many orders.

PENZEYS, LTD. SPICE HOUSE
P.O.Box 933
Muskego, WI 53150-0933
(414) 679-7207 voice
(414) 679-7878 fax
http://www.penzeys.com/
E-mail: info@penzeys.com

Herb and spice supply house. Excellent prices on bulk quantities of herbs and spices. Good quality and variety.

SAUSAGE MAKER, THE
1500 Clinton St
Building 123
Buffalo, NY 14207-2875
(716) 824-6510 voice

Mail order sausage making, meat curing and smoking supplies, training videos, equipment, etc

STUFFERS SUPPLY COMPANY
22958 Fraser Highway
Langley, B.C. V2Z 2T9
(604) 534 7374
(604) 534 3089 fax
http://www.harb.net/stuffers
E-mail: bleathem@stuffers.com

A Canadian source of sausage making and meat curing supplies.

G.2.3. FOOD STORAGE AND PRESERVATION EQUIPMENT MANUFACTURERS

BERLIN PACKAGING
National Customer Service Center
435 East Algonquin Rd
Arlington Heights, IL 60055
(also regional sites, addresses on web site)
(800) 423-7546
http://www.berlinpackaging.com
E-mail: info@berlinpackaging.com

Food grade packaging and containers, primarily plastic, but also metal and glass. They claim no order is too small.

CONSOLIDATED PLASTICS
8181 Darrow Rd

Twinsburg, OH 44087
(800) 362-1000
(216) 425-3900
(216) 425-3333 fax

FDA approved plastic food storage containers, food grade plastic bags, screw off bucket lids and more. Ask for their Rubbermaid, laboratory/industrial catalogs and bags/packaging/shipping catalogs.

COUNTRY LIVING PRODUCTS
14727 56th Avenue NW
Stanwood, Washington 98292

Manufacturer of the Country Living grain mill.

DESICCARE, INC

East coast facility
211 Industrial Dr
Richland, MS 39218
(888) 932-0405
(601) 932-0442 fax

West coast facility
10600 Shoemaker Ave, Bldg C
Santa Fe Springs, CA 90670-4026
(800) 446-6650
(562) 903-2272

http://dessicare.com/homeprod.htm
E-mail: desiccant@desiccare.com

Retail sales of pre-packaged and bulk desiccants.

DRYING PANTRY, THE
9756 South Kristin Drive
Sandy, Utah 84070
(801) 571-9115

A non-electric kitchen food dryer. Uses naturally occurring heat, either from the sun or your homes heating system. Hangs from a hook to save counter space. It can also serves as a sprouter.

FREUND CAN COMPANY
155 West 84th St
Chicago, IL 60620-1298
(773) 224-4230 ext 179
(773) 224-8812 fax
http://www.freundcan.com

Metal, glass and plastic containers. Can sealers of several sorts. Claims will sell any quantity.

GLITCHPROOF.COM
3171 Green Valley Rd #11
Birmingham, AL 35243
(205) 302-0706
(205) 969-9356
http://www.glitchproof.com
E-mail: info@glitchproof.com

No food, but carries kits and products for do-it-yourself food storage.

Buckets, lids, oxygen absorbers, Mylar and poly liner bags, 55 gallon food-safe drum liners, and other packaging items.

LIFE SPROUTS
Post Office Box 150
Paradise, Utah 84328-0150
(800) 241-1516

Manufactures the Sprout Master Sprouter and carries organic sprouting seeds. Also markets recipe books, food storage.

UNITED STATES PLASTICS
1390 Neubrecht Rd
Lima, OH 45801
(800) 537-9724
(419) 228-5034 fax
http://www.usplastic.com
E-mail: usp@usplastics.com

FDA approved plastic food storage containers, food grade plastic bags, screw off bucket lids and more.

WELLS CAN COMPANY, LTD.
8705 Government St
Burnaby, British Columbia V3N 4G9 Canada
(604) 420-0959
(604) 420-0975 fax
http://www.cobra-net/wellscan/canning.html
E-mail: wellscan@lightspeed.bc.ca

A Canadian manufacturer of pressure canners & cookers, can sealers, metal cans, canning jars, plastic and metal buckets and vacuum sealers. Retail sales.

G.2.4 DIATOMACEOUS EARTH MANUFACTURERS AND DEALERS

ALL GONE!
Phone: 800-373-3423
E-mail allgone1@vero.com

Diatomaceous earth

DIATECT CORPORATION
c/o Gordon Dill 410 E. 48th St Holland, MI 49423

Diatomaceous earth

FOSSIL SHELL SUPPLY COMPANY
P.O. Box 50225 Amarillo TX 79159
(800) 370-9920
(806) 355-4236 voice
(806) 351-0777 fax
http://www.webtex.com/webtex/com/fssc /

E-mail jandj@arn.net

Diatomaceous earth

NECESSARY ORGANICS, INC
One Nature's Way
New Castle, VA 24127-0305

Concern brand diatomaceous earth. This is the brand I've been buying.

PLANET NATURAL
1612 Gold Ave
P.O. Box 3146
Bozeman, MT 59772
(800) 289-6656
(406) 587-0223 fax
http://www.webcom/ecostore/index.html
E-mail: ecostore@webcom.com

A very green dealer. The DE is in the Soaps, Oils and More directory.

G.2.5 STORAGE FOOD RETAIL DEALERS

AMERICAN FREEDOM NETWORK, THE
P.O. Box 1750
Johnstown, CO 80534
(800) 205-6245 orders
http://www.amerifree.com/index.htm
E-mail: comments@amerifree.com

Mainstay Emergency Ration bars, Country Living grain mill, Katadyn water filters. Pre-packaged storage foods, including organic.

B&A PRODUCTS
Rt 1 Box 100
Bunch, OK 74931-9705
(918) 696-5998
(918) 696-5999 fax
http://www.baproducts.com
E-mail: Byron@baproducts.com

Water filters, Ready Reserve, Alpineaire foods and Heater Meals.

BACK TO BASICS (KATHLEEN LAMONT)
P.O. Box 1138
Waynesville, NC 28786
(704) 452-2866
http://www.dnet.net/~basics
E-mail: basics@dnet.net

Many good books, food dehydrator, Tilia vacuum sealer, video taped food storage courses. Lamont lectures at some preparedness expos.

BEST PRICES STORABLE FOODS by Bruce Hopkins
1737 Cascade St
Mesquite (Dallas) Texas 75149
(972) 288-0262 in the p.m.
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Pre-packaged dehydrated foods, bulk foods, grains, legumes, and grain mills. Mylar bags, oxygen absorbers, containers and DE. Mountain House freeze dried foods. Organic foods.

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http://www.kootenet.net/csin/index.htm
E-mail: CSIN@kootenet.net

Grain mills, bulk and nitrogen packed (buckets & cans) grains, legumes, dehydrated and freeze dried foods, sprouting seeds. Oxygen absorbers and Mylar bags. $100 minimum order.

EMERGENCY ESSENTIALS
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A major preparedness retailer. Storage foods of all types, MRE's, water purifiers, storage containers, grain mills and other food equipment. Excellent costs on shipping. Free preparedness software.

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Heater Meals, Datrex ration bars and MREs. Water filters.

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Canadian "Freddy Chef" MREs and other surplus related items, primarily Canadian or British.

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Pre-packaged foods, bulk grains, legumes and dehydrated foods. MRE's, freeze dried foods, grain mills.

HOMESTEAD PRODUCTS
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Several grain mills, Katadyn water filters and Aladdin lamps.

J&K ENTERPRISES
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Pre-packaged storage foods, bulk grains, legumes, dehydrated foods organics, Alpineaire, sprouting seeds. Oxygen absorbers, grain mills.

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Bulk dehydrated foods.

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(405) 794-7365
The site did not list a postal address
http://www.universalweb.com/food/index.htm
E-mail: ron@universalweb.com

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Gardena, California 90248
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(310) 324-6909 fax
http://majorsurplusnsurival.com
E-mail: info@majorsurplusnsurvival.com

MRE's and some food/water storage containers.

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Cassel, CA 96016
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E-mail: mcs@C-zone.net

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Pre-packaged and bulk dehydrated, freeze-dried, storage foods. Datrex and Mainstay ration bars. Mountain House and Alpineaire foods and civilian MREs. Water storage containers and filters. Grain mills, #10 can sealer. Oxygen absorbers and Mylar bags..

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Preparedness food, equipment and supplies. MRE's, Mountain House freeze dried foods, Heatermeals, BFM (Balanced Food Mix), 26 page catalog, send $2.

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Pre-packaged and bulk long term storage foods, books, grain mills, containers (empty #10 cans for home use). Oxygen absorbers (in emergency preparedness section).

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E-mail: Sales@avicom.net

Alpineaire pre-packaged foods, their own cannery line as well. Grain mills, books, Oxygen absorbers.

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SHERRY'S STOREHOUSE
P.O. Box 1507
Merlin, OR 97532
(541) 471-7859 days
(541) 660-8267 evenings
(800) 662-0137 fax
http://www.homezen.com/sherstor/sherstor.html
E-mail: none listed.

Grains, legumes, dehydrated, freeze dried, organic bulk and nitrogen packed foods (buckets and cans), sprouting seeds, Mainstay ration bars. Oxygen absorbers, Mylar bags, #10 cans and grain mills.

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P.O. Box 851293
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(972) 495-5270 voice
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http://www.southsummit.com
E-mail: southsummit@topher.net

Provident Pantry long term storage foods, MRE's, water storage, filters and containers, ration bars, freeze dried foods (multiple manufacturer's), plastic food storage buckets.

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A lot of books, not all of them useful. Pre-packaged food plans. Mountains House freeze dried foods in pouches and cans. MRE's. Grain mills. For catalog send $2.00.

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http://www.wheatmt.com

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Gainesville, Fl 32614-0008

Information concerning emergencies and emergency management

Disaster may strike quickly and without warning. These events can be frightening for adults, but they are traumatic for children if they don't know what to do.

Children and Their Response to Disaster

Children depend on daily routines: They wake up, eat breakfast, go to school, play with friends. When emergencies or disasters interrupt this routine, children may become anxious. In a disaster, they'll look to you and other

adults for help. How you react to an emergency gives them clues on how to act.
If you react with alarm, a child may become more scared.

They see our fear as proof that the danger is real. If you seem overcome with a sense of loss, a child may feel their losses more strongly. Children's fears also may stem from their imagination, and you should take these feelings seriously. A child who feels afraid is afraid. Your words and actions can provide reassurance. When talking with your child, be sure to present a realistic picture that is both honest and manageable. Feeling or fear are healthy and natural for adults and children. But as an adult, you need to keep control of the situation.

When you're sure that danger has passed, concentrate on your child's emotional needs by asking the child what's uppermost in his or her mind. Having children participate in the family's recovery activities will help them feel that their life will return to "normal." Your response during this time may have a lasting impact. Be aware that after a disaster, children are most afraid that the event will happen again. someone will be injured or killed. they will be separated from the family. they will be left alone.

Advice to Parents: Prepare for Disaster

You can create a Family Disaster Plan by taking four simple steps. First, learn what hazards exist in your community and how to prepare for each. Then meet with your family to discuss what you would do, as a group, in each situation. Next, take steps to prepare your family for disaster such as: posting emergency phone numbers, selecting an out-of-state family contact, assembling disaster supplies kits for each member of your household and installing smoke detectors on each level of your home. Finally, practice your Family Disaster Plan so that everyone will remember what to do when a disaster does occur.

Develop and practice a Family Disaster Plan. Contact your local emergency

management or civil defense office, or your local Red Cross chapter for materials that describe how your family can create a disaster plan. Everyone in the household, including children, should play a part in the family's response and recovery efforts.

Teach your child how to recognize danger signals. Make sure your child knows what smoke detectors, fire alarms and local community warning systems (horns, sirens) sound like.

Explain how to call for help. Teach your child how and when to call for help. Check the telephone directory for local emergency phone numbers and post these phone numbers by all telephones. If you live in a 9-1-1-service area, tell your child to call 9-1-1. Help your child memorize important family information. Children should memorize their family name, address and phone number. They should also know where to meet in case of an emergency. Some children may not be old enough to memorize the information. They could carry a small index card that lists emergency information to give to an adult or babysitter.

AFTER THE DISASTER: TIME FOR RECOVERY

Immediately after the disaster, try to reduce your child's fear and anxiety.Keep the family together. While you look for housing and assistance, you may want to leave your children with relatives or friends. Instead, keep the family together as much as possible and make children a part of what you are doing to get the family back on its feet. Children get anxious, and they'll worry that their parents won't return. Calmly and firmly explain the situation. As best as you can, tell children what you know about the disaster. Explain what will happen next. For example, say, "Tonight, we will all stay together in the shelter." Get down to the child's eye level and talk to them. Encourage children to talk. Let children talk about the disaster and ask questions as much as they want. Encourage children to describe what they're

feeling. Listen to what they say. If possible, include the entire family in the discussion. Include children in recovery activities. Give children chores that are their responsibility.

This will help children feel they are part of the recovery. Having a task will help them understand that everything will be all right. You can help children cope by understanding what causes their anxieties and fears. Reassure them with firmness and love. Your children will realize that life will eventually return to normal. If a child does not respond to the above suggestions, seek help from a mental health specialist or a member of the clergy. The Federal Emergency Management Agency's Community and Family Preparedness Program developed this brochure in cooperation with the American Red Cross' Community Disaster Education Program. Both are national efforts to help people prepare for disasters of all types. For more information on how to prepare for and respond to disaster, contact your local or State office of emergency management and your local Red Cross chapter. Ask for Your Family Disaster Plan.
Or, write to: FEMA, P.O. Box 70274, Washington, D.C. 20024.

FACT SHEET: TSUNAMIS
A tsunami is a series of waves that may be dangerous and destructive. When you hear a tsunami warning, move at once to higher ground and stay there until local authorities say it is safe to return home.

BEFORE

Find out if your home is in a danger area. Know the height of your street above sea level and the distance of your street from the coast. Evacuation orders may be based on these numbers. Be familiar with the tsunami warning signs. Because tsunamis can be caused by an underwater disturbance or an earthquake, people living along the coast should consider an earthquake or a sizable ground rumbling as a warning signal. A noticeable rapid rise or fall in coastal waters is also a sign that a tsunami is approaching. Make sure all

family members know how to respond to a tsunami. Make evacuation plans. Pick an inland location that is elevated. After an earthquake or other natural disaster, roads in and out of the vicinity may be blocked, so pick more than one evacuation route. Teach family members how and when to turn off gas, electricity, and water. Teach children how and when to call 9-1-1, police or fire department, and which radio station to listen for official information.

Have disaster supplies on hand. Flashlight and extra batteries, Portable, battery-operated radio and extra batteries, First aid kit and manual, Emergency food and water, Nonelectric can opener, Essential medicines, Cash and credit, cards, Sturdy shoes, Develop an emergency communication plan. In case family members are separated from one another during a tsunami (a real possibility during the day when adults are at work and children are at school), have a plan for getting back together. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, often it's easier to call long distance. Make sure everyone knows the name, address, and phone number of the contact person. Contact your local emergency management office or American Red Cross chapter for more information on tsunamis.

DURING

Listen to a radio or television to get the latest emergency information, and be ready to evacuate if asked to do so. If you hear an official tsunami warning or detect signs of a tsunami, evacuate at once. Climb to higher ground. A tsunami warning is issued when authorities are certain that a tsunami threat exists. Stay away from the beach.

Never go down to the beach to watch a tsunami come in. If you can see the wave you are too close to escape it. Return home only after authorities advise it is safe to do so.

A tsunami is a series of waves. Do not assume that one wave means that the danger over.

The next wave may be larger than the first one. Stay out of the area.

AFTER

Stay tuned to a battery-operated radio for the latest emergency information.

Help injured or trapped persons. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help. Remember to help your neighbors who may require special assistance--infants, elderly people, and people with disabilities. Stay out of damaged buildings. Return home only when authorities say it is safe.

Enter your home with caution. Use a flashlight when entering damaged buildings.

Check for electrical shorts and live wires. Do not use appliances or lights until an electrician has checked the electrical system. Open windows and doors to help dry the building. Shovel mud while it is still moist to give walls and floors an opportunity to dry. Check food supplies and test drinking water. Fresh food that has come in contact with flood waters may be contaminated and should be thrown out. Have tap water tested by the local health department.

INSPECTING UTILITIES IN A DAMAGED HOME

Check for gas leaks--If you smell gas or hear a blowing or hissing noise, open a window and quickly leave the building. Turn off the gas at the outside main valve if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.

Look for electrical system damage--If you see sparks or broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker.

If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Check for sewage and water lines damage--If you suspect sewage lines are damaged, avoid using toilets and call a plumber. If water pipes are damaged, contact the water company and avoid the water from the tap. You can obtain safe water by melting ice cubes.

MITIGATION

Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies.

Investing in preventive mitigation steps now, such as checking local building codes and ordinances about wind-resistant designs and strengthening unreinforced masonry, will help reduce the impact of tornadoes in the future. For more information on mitigation, contact your local emergency management office.

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Remember to help your neighbors who may require special assistance--infants,

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Return home only when authorities say it is safe. Enter your home with caution.

Use a flashlight when entering damaged buildings. Check for electrical shorts and live wires. Do not use appliances or lights until an electrician has checked the electrical system. Open windows and doors to help dry the building.

Shovel mud while it is still moist to give walls and floors an opportunity to dry. Check food supplies and test drinking water. Fresh food that has come in contact with flood waters may be contaminated and should be thrown out. Have tap water tested by the local health department.

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If water pipes are damaged, contact the water company and avoid the water from the tap. You can obtain safe water by melting ice cubes.

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FACT SHEET: VOLCANOES

Volcanic eruptions can hurl hot rocks for at least 20 miles. Floods, airborne ash, or noxious fumes can spread 100 miles or more. If you live near a known volcano, active or dormant, be ready to evacuate at a moment's notice.

BEFORE

Learn about your community warning systems. Be prepared for these disasters that can be spawned by volcanoes. Earthquakes, Flash floods, Landslides and mudflows, Thunderstorms, Tsunamis, Make evacuation plans. You want to get to high ground away from the eruption. Plan a route out and have a backup route in mind. Develop an emergency communication plan. In case family members are separated from one another during a volcanic eruption (a real possibility during the day when adults are at work and children are at school), have a plan for getting back together. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance.

Make sure everyone knows the name, address, and phone number of the contact person. Have disaster supplies on hand. Flashlight and extra batteries, Portable, battery-operated radio and extra batteries, First aid kit and manual, Emergency food and water, Nonelectric can opener, Essential medicinesCash and credit cards, Sturdy shoes, Get a pair of goggles, and a throw-away breathing mask for each member of the household, Contact your local emergency management office or American Red Cross chapter for more information on volcanoes. Evacuation Although it may seem safe to stay at home and wait out an eruption, doing so could be very dangerous. The rock debris from a volcano can break

windows and set buildings on fire. Stay safe. Follow authorities' instructions and leave the area before the disaster begins.

DURING

Follow the evacuation order issued by authorities. Avoid areas downwind of the volcano. If caught indoors: Close all windows, doors, and dampers. Put all machinery inside a garage or barn. Bring animals and livestock into closed shelters. If trapped outdoors: Seek shelter indoors. If caught in a rockfall, roll into a ball to protect head. Avoid low-lying area where poisonous gases can collect and flash floods can be most dangerous. If caught near a stream, beware of mudflows. Protect yourself: Wear long sleeved shirts and pants. Use goggles to protect eyes. Use a dust-mask or hold a damp cloth over face to help breathing. Keep car or truck engines off. Stay out of the area. A lateral blast of a volcano can travel many miles from the mountain. Trying to watch an erupting volcano is a deadly idea. Mudflows are powerful "rivers" of mud that can move faster than people can walk or run. Mudflows occur when rain falls through ash-carrying clouds or when rivers are damed during an eruption. They are most dangerous close to stream channels. When you approach a bridge, first look upstream.

If a mudflow is approaching or moving beneath the bridge, do not cross the bridge. The power of the mudflow can destroy a bridge very quickly.

AFTER

Listen to a battery-powered radio or television for the latest emergency information. Stay away from volcanic ashfall. When outside cover your mouth and nose. A number of victims of the Mount St. Helens volcano died from inhaling ash. Wear goggles to protect your eyes. Keep skin covered to avoid irritation or burns. If you have a respiratory ailment, avoid contact with any amount of ash. Stay indoors until local health officials advise it is safe to go outside. Avoid driving in heavy ashfall. Driving will stir up more ash that

can clog engines and stall vehicles. Clear roofs of ashfall. Ashfall is very heavy and can cause buildings to collapse. Remember to help your neighbors who may require special assistance--infants, elderly people, and people with disabilities.

FACT SHEET: WILDLAND FIRES

The threat of wildland fires for people living near wildland areas or using recreational facilities in wilderness areas is real. Advance planning and knowing how to protect buildings in these areas can lessen the devastation of a wildland fire.

BEFORE

Learn and teach safe fire practices. Build fires away from nearby trees or bushes. Always have a way to extinguish the fire quickly and completely. Never leave a fire--even a cigarette--burning unattented. Obtain local building codes and weed abatement ordinances for structures built near wooded areas.

Use fire-resistant materials when building, renovating, or retrofitting structures. Create a safety zone to separate the home from combustible plants and vegetation. tone walls can act as heat shields and deflect flames. Swimming pools and patios can be a safety zone. Check for fire hazards around home.

Install electrical lines underground, if possible. Keep all tree and shrub limbs trimmed so they don't come in contact with the wires. Prune all branches around the residence to a height of 8 to 10 feet. Keep trees adjacent to buildings free of dead or dying wood and moss. Remove all dead limbs, needles, and debris from rain gutters. Store combustible or flammable materials in approved safety containers and keep them away from the house.

Keep chimney clean. Avoid open burning completely, and especially during dry season. Install smoke detectors on every level of your home and near sleeping

areas. Make evacuation plans. Plan several routes in case the fire blocks
escape
route. Have disaster supplies on hand, flashlight with extra batteries,
Portable, battery-operated radio and extra batteries, First aid kit and manual,
Emergency food and water, Nonelectric can opener Essential medicines, Cash and
credit cards, Sturdy shoes, Develop an emergency communication plan. In case
family members are separated from one another during a wildland fire (a real
possibility during the day when adults are at work and children are at school),
have a plan for getting back together. Ask an out-of-state relative or friend
to serve as the "family contact." After a disaster, it's often easier to call
long distance. Make sure everyone knows the name, address, and phone number of
the contact person.

Fire-Resistant Building Materials

Avoid using wooden shakes and shingles for a roof. Use tile, stucco, metal
siding, brick, concrete block, rock, or other fire-resistant materials. Use
only thick, tempered safety glass in large windows and sliding glass doors.
Contact your local emergency management office or American Red Cross chapter
for more information on wildland fires.

DURING
Turn on a battery-operated radio to get the latest emergency information.
Remove combustible items from around the house. Lawn and poolside furniture,
Umbrellas, Tarp coverings, Firewood, Take down flammable drapes and curtains
and close all venetian blinds or noncombustible window coverings. Take action
to protect your home. lose all doors and windows inside your home to prevent
draft. Close gas valves and turn off all pilot lights. Turn on a light in each
room for visibility in heavy smoke. Place valuables that will not be damaged by
water in a pool or pond. If hoses and adequate water are available, leave
sprinklers on roofs and anything that might be damaged by fire. Be ready to

evacuate all family members and pets when fire nears or when instructed to do so by local officials.

AFTER

Take care when re-entering a burned wildland area. Hot spots can flare up without warning. Check the roof immediately and extinguish any sparks or embers. Check the attic for hidden burning sparks. For several hours afterward, re-check for smoke and sparks throughout the home. If trapped in a wildland fire, you cannot outrun a fire. Crouch in a pond or river. Cover head and upper body with wet clothing. If water is not around, look for shelter in a cleared area or among a bed of rocks. Lie flat and cover body with wet clothing or soil. Breathe the air close to the ground through a wet cloth to avoid scorching lungs or inhaling smoke.

SHEET: HURRICANES

Hurricanes can be dangerous killers. Learning the hurricane warning messages and planning ahead can reduce the chances of injury or major property damage.

BEFORE

Plan an evacuation route. Contact the local emergency management office or American Red Cross chapter, and ask for the community hurricane preparedness plan. This plan should include information on the safest evacuation routes and nearby shelters. Learn safe routes inland. Be ready to drive 20 to 50 miles inland to locate a safe place. Have disaster supplies on hand. Flashlight and extra batteries Portable, battery-operated radio and extra batteries First aid kit and manual Emergency food and water Nonelectric can opener Essential medicines Cash and credit cards Sturdy shoes Make arrangements for pets. Pets may not be allowed into emergency shelters for health and space reasons. Contact your local humane society for information on local animal shelters.

Make sure that all family members know how to respond after a hurricane.

Teach family members how and when to turn off gas, electricity, and water.

Teach children how and when to call 9-1-1, police, or fire department and which radio station to tune to for emergency information. Protect your windows.

Permanent shutters are the best protection. A lower-cost approach is to put up plywood panels. Use 1/2 inch plywood--marine plywood is best--cut to fit each window. Remember to mark which board fits which window. Pre-drill holes every 18 inches for screws. Do this long before the storm. Trim back dead or weak branches from trees. Check into flood insurance. You can find out about the National Flood Insurance Program through your local insurance agent or emergency management office. There is normally a 30-day waiting period before a new policy becomes effective. Homeowners polices do not cover damage from the flooding that accompanies a hurricane. Develop an emergency communication plan.

In case family members are separated from one another during a disaster (a real possibility during the day when adults are at work and children are at school), have a plan for getting back together. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance. Make sure everyone in the family knows the name, address, and phone number of the contact person.

Hurricane Watches and Warnings

A hurricane watch is issued when there is a threat of hurricane conditions within 24-36 hours. A hurricane warning is issued when hurricane conditions (winds of 74 miles per hour or greater, or dangerously high water and rough seas) are expected in 24 hours or less.

DURING A HURRICANE WATCH

Listen to a battery-operated radio or television for hurricane progress reports.

Check emergency supplies. Fuel car. Bring in outdoor objects such as lawn

furniture, toys, and garden tools and anchor objects that cannot be brought inside. Secure buildings by closing and boarding up windows. Remove outside antennas. Turn refrigerator and freezer to coldest settings. Open only when absolutely necessary and close quickly. Store drinking water in clean bathtubs, jugs, bottles, and cooking utensils. Review evacuation plan. Moor boat securely or move it to a designated safe place. Use rope or chain to secure boat to trailer. Use tiedowns to anchor trailer to the ground or house.

DURING A HURRICANE WARNING

Listen constantly to a battery-operated radio or television for official instructions. If in a mobile home, check tiedowns and evacuate immediately.

Store valuables and personal papers in a waterproof container on the highest level of your home. Avoid elevators. If at home: Stay inside, away from windows, skylights, and glass doors. Keep a supply of flashlights and extra batteries handy. Avoid open flames, such as candles and kerosene lamps, as a source of light. If power is lost, turn off major appliances to reduce power "surge" when electricity is restored. If officials indicate evacuation is necessary: Leave as soon as possible. Avoid flooded roads and watch for washed-out bridges.

Secure your home by unplugging appliances and turning off electricity and the main water valve. Tell someone outside of the storm area where you are going.

If time permits, and you live in an identified surge zone, elevate furniture to protect it from flooding or better yet, move it to a higher floor. Bring pre-assembled emergency supplies and warm protective clothing. Take blankets and sleeping bags to shelter. Lock up home and leave.

AFTER

Stay tuned to local radio for information. Help injured or trapped persons.

Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help. Return home

only after authorities advise that it is safe to do so. Avoid loose or dangling power lines and report them immediately to the power company, police, or fire department. Enter your home with caution. Beware of snakes, insects, and animals driven to higher ground by flood water. Open windows and doors to ventilate and dry your home. Check refrigerated foods for spoilage. Take pictures of the damage, both to the house and its contents and for insurance claims. Drive only if absolutely necessary and avoid flooded roads and washed-out bridges. Use telephone only for emergency calls.

INSPECTING UTILITIES IN A DAMAGED HOME

Check for gas leaks--If you smell gas or hear blowing or hissing noise, open a window and quickly leave the building. Turn off the gas at the outside main valve if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional. Look for electrical system damage--If you see sparks or broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Check for sewage and water lines damage--If you suspect sewage lines are damaged avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid the water from the tap. You can obtain safe water by melting ice cubes.

MITIGATION

Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in preventive mitigation steps now such as strengthening unreinforced masonry to withstand wind and flooding and installing shutters on every window will help reduce the impact of hurricanes in the future. For more information on mitigation , contact your local emergency management office.

FEMA - FACT SHEET: WINTER DRIVING SHEET: WINTER DRIVING

The leading cause of death during winter storms is transportation accidents.
Preparing your vehicle for the winter season and knowing how to react if
stranded or lost on the road are the keys to safe winter driving.

BEFORE

Have a mechanic check the following items on your car.
Battery, Antifreeze, Wipers and windshield washer fluid, Ignition system,
Thermostat, Lights, Flashing hazard lights, Exhaust system, Heater,
Brakes, Defroster, Oil level (if necessary, replace existing oil with a winter
grade oil or the SAE 10w/30 weight variety)
Install good winter tires. Make sure the tires have adequate tread.
All-weather radials are usually adequate for most winter conditions. However,
some jurisdictions require that to drive on their roads, vehicles must be
equipped with chains or snow tires with studs. Keep a windshield scraper and
small broom for ice and snow removal. Maintain at least a half tank of gas
during the winter season. Plan long trips carefully. Listen to the radio or
call the state highway patrol for the latest road conditions. Always travel
during daylight and, if possible, take at least one other person. If you must
go out during a winter storm, use public transportation. Dress warmly. Wear
layers of loose-fitting, layered, lightweight clothing. Carry food and water.
Store a supply of high energy "munchies" and several bottles of water. Contact
your local emergency management office or American Red Cross chapter for more
information on winter driving.

Winter Car Kit

Keep these items in your car:

Flashlights with extra batteries, First aid kit with pocket knife, Necessary
medications, Several blankets, Sleeping bags, Extra newspapers for insulation

Plastic bags (for sanitation), Matches, Extra set of mittens, socks, and a wool

cap, Rain gear and extra clothes, Small sack of sand for generating traction under wheels, Small shovel, Small tools (pliers, wrench, screwdriver), Booster cables, Set of tire chains or traction mats, Cards, games, and puzzles, Brightly colored cloth to use as a flag, Canned fruit and nuts, Nonelectric can opener, Bottled water,

DURING

IF TRAPPED IN CAR DURING A BLIZZARD

Stay in the car. Do not leave the car to search for assistance unless help is visible within 100 yards. You may become disoriented and lost is blowing and drifting snow. Display a trouble sign. Hang a brightly colored cloth on the radio antenna and raise the hood. Occasionally run engine to keep warm. Turn on the car's engine for about 10 minutes each hour. Run the heater when the car is running. Also, turn on the car's dome light when the car is running. Beware of carbon monoxide poisoning.Keep the exhaust pipe clear of snow, and open a downwind window slightly for ventilation. Watch for signs of frostbite and hypothermia. Do minor exercises to keep up circulation. Clap hands and move arms and legs occasionally. Try not to stay in one position for too long. If more than one person is in the car, take turns sleeping. For warmth, huddle together.

Use newspapers, maps, and even the removable car mats for added insulation.

Avoid overexertion. Cold weather puts an added strain on the heart.

Unaccustomed exercise such as shoveling snow or pushing a car can bring on a heart attack or make other medical conditions worse. Be aware of symptoms of dehydration.

Wind Chill

"Wind chill" is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. A strong wind combined with a temperature of just below freezing can have the same effect as a still air temperature about 35 degrees colder.

Winter Storm Watches and Warnings

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. A blizzard warning means that large amounts of falling or blowing snow and sustained winds of at least 35 miles per hour are expected for several hours.

Frostbite and Hypothermia

Frostbite is a severe reaction to cold exposure that can permanently damage its victims. A loss of feeling and a white or pale appearance in fingers, toes, or nose and ear lobes are symptoms of frostbite. Hypothermia is a condition brought on when the body temperature drops to less than 55 degrees Fahrenheit.

Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion. If frostbite or hypothermia is suspected, begin warming the person slowly and seek immediate medical assistance. Warm the person's trunk first. Use your own body heat to help. Arms and legs should be warmed last because stimulation of the limbs can drive cold blood toward the heart and lead to heart failure. Put person in dry clothing and wrap their entire body in a blanket.Never give a frostbite or hypothermia victim something with caffeine in it(like coffee or tea) or alcohol. Caffeine, a stimulant, can cause the heart to beat faster and hasten the effects the cold has on the body. Alcohol, a depressant, can slow the heart and also hasten the ill effects of cold body temperatures.

FACT SHEET: HOUSE AND BUILDING FIRES

A fire can engulf a structure in a matter of minutes. Understanding the basic characteristics of fire and learning the proper safety practices can be the key to surviving a house or building fire.

BEFORE

Install smoke detectors. Check them once a month and change the batteries at least once a year. Develop and practice an escape plan. Make sure all family

members know what to do in a fire. Draw a floor plan with at least two ways of escaping every room. Choose a safe meeting place outside the house. Practice alerting other household members. It is a good idea to keep a bell and a flashlight in each bedroom for this purpose. Practice evacuating the building blindfolded. In a real fire situation, the amount of smoke generated by a fire will most likely make it impossible to see. Practice staying low to the ground when escaping. Feel all doors before opening them.

If the door is hot, get out another way. Learn to stop, drop to the ground, and roll if clothes catch fire. Post emergency numbers near telephones. However, be aware that if a fire threatens your home, you should not place the call to your emergency services from inside the home. It is better to get out first and place the call from somewhere else. Purchase collapsible ladders at hardware stores and practice using them. Install A-B-C type fire extinguishers in the home and teach family members how to use them. Do not store combustible materials in closed areas or near a heat source. Cooking keep the stove area clean and clear of combustibles such as bags, boxes, and other appliances. If a fire starts, put a lid over the burning pan or use a fire extinguisher. Be careful. Moving the pan can cause the fire to spread. Never pour water on grease fires. Check electrical wiring. Replace wiring if frayed or cracked.

Make sure wiring is not under rugs, over nails, or in high traffic areas. Do not overload outlets or extension cords. Outlets should have cover plates and no exposed wiring. Only purchase appliances and electrical devices that have a label indicating that they have been inspected by a testing laboratory such as Underwriter's Laboratories (UL) or Factory Mutual (FM).

DURING

Get out as quickly and as safely as possible. Use the stairs to escape. When evacuating, stay low to the ground. If possible, cover mouth with a cloth to avoid inhaling smoke and gases. Close doors in each room after escaping to

delay the spread of the fire. If in a room with a closed door. If smoke is pouring in around the bottom of the door or it feels hot, keep the door closed.

Open a window to escape or for fresh air while awaiting rescue. If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.

If there is too much smoke or fire in the hall, slam the door shut. Call the fire department from a location outside the house.

AFTER

Give first aid where appropriate. Seriously injured or burned victims should be transported to professional medical help immediately. Stay out of damage buildings. Return home only when local fire authorities say it is safe. Look for structural damage. Discard food that has been exposed to heat, smoke, or soot. Contact insurance agent. Don't discard damaged goods until after an inventory has been taken. Save receipts for money relating to fire loss.

Heating devices such as portable heaters, wood stoves, and fireplaces demand safe operation. Use portable heaters in well-ventilated rooms only. Refuel kerosene heaters outdoors only. Have chimneys and wood stoves cleaned annually. Buy only approved heaters and follow the manufacturers' directions.

Smoke detectors more than double the chance of surviving a fire. Smoke detectors sense abnormal amounts of smoke or invisible combustion gases in the air. They can detect both smoldering and burning fires. At least one smoke detector should be installed on every level of a structure. Test the smoke detectors each month and replace the batteries at least once a year. Purchase smoke detectors labeled by the Underwriter's Laboratories (UL) or Factory Mutual.

Family Disaster Plan and Personal Survival Guide there are many differentkinds of disasters. Earthquakes, floods, fires, airplane crashes, chemical spills, pipeline leaks and explosions, and others, small and large, which seldom give warning are equally devastating to their victims. This

guide is primarily geared to earthquakes, but the planning you and your family do now will be of benefit when and if any disaster strikes you. Family Meetings: At least once a year have a meeting with your family to discuss and update your plan and determine what training, equipment and supplies are needed. Occasional drills will assure quick reaction and avoid injury and panic in an emergency. Share your plans with neighbours, friends, relatives, and co-workers.

Preparedness Activities

Learn how to protect yourself from falling objects, smoke, fire, caustic fumes, etc. Learn First Aid (available through your local Red Cross Chapter)
Persons Trained: _____ Date: _____
Location of First Aid kit: _____
Learn how and where to shut off utilities.
Location of gas valve: _____
Location of wrench: _____
Location of main water valve: _____
Location of main circuit breaker: _____
Location of other utilities:_____
Draw a Plan of your home
On a piece of paper draw a floor plan of your home showing the location of exit windows and doors, utility cutoffs, First Aid Kit, emergency supplies, food, clothing, tools, etc. Be sure everyone in you household is familiar with it. Show it to baby-sitters and house guests when you're going to be away. They could use it to direct someone to a utility cutoff in an emergency. List alternate places to meet around home
Outside: _____
Inside: _____
Alternate reunion locations when family is not at home, e.g. Red Cross shelter, neighbour, relative, park, school.

_____

Learn and discuss school disaster policy. Church? Club? Other? Are medical consent forms complete?

_____

Identify where emergency supplies and equipment are located.
Fire extinguisher: _____
Flashlight/Batteries: _____
Portable radio: _____
Tools: _____
Safety equipment: _____
Water: _____

Sanitation supplies: _____
Food: _____
Cooking equipment: _____
Blankets: _____
Extra eyeglasses: _____
Medication: _____
First Aid Supplies: _____
Complete set of clothes, shoes, gloves:_____

After an Earthquake be prepared for after shocks If you must evacuate Special Health Needs
be prepared for after shocks Put on Heavy shoes immediately to avoid injury from
stepping on glass and other debris. Check for injuries and give first aid.
Check for fires and fire hazards.Remove fallen objects from top of stove.
Sniff for gas leaks, starting at the hot water heater. If you smell gas or
suspect a leak, turn off main gas valve, open windows and carefully leave
house.
Do not turn lights on or off or light matches or do anything that makes a
spark.
Note: Do not shut off gas unless an emergency exists. Do Not turn it back on
until the gas company or plumber has checked it out. If damage to electrical
system is suspected, (frayed wires, sparks or the smell of hot insulation) turn
off system at main circuit breaker or fuse box. If water leaks are suspected,
shut off water at main valve. Check neighbours for injury. Turn on radio and
listen for advisories. Locate light source if necessary. Do not touch downed
power lines or objects touched by downed wires. Clean up potentially harmful
materials. Do not use phone except for genuine emergencies. Check house, roof
and chimney for damage. Check emergency supplies. Check to see that sewage
lines are intact before continued flushing of toilets. Do not go sightseeing.
Open closets and cupboards carefully. Cooperate with public safety officials.
Be prepared to evacuate when necessary. If you must evacuate prominently post a
message indicating where you can be found. Take with you a First Aid kit
Flashlight, radio and batteries Important papers and cash, Food, Sleeping

bags/blankets, Clothes, Toiletries and personal item, Baby supplies, Special Health Needs, Keep a list posted of supplies/equipment that your particular family members may need to take with them in case of evacuation. Include such items as: Medication, insulin & syringes, Dentures, Eyeglasses, contact lens supplies, Wheelchairs, walker, crutches, Oxygen tanks, Special dietary needs, special baby formula. Name and number of family doctor and dentist.

Pets In a Disaster

Pets are not permitted in shelters, so families should plan for their pets in the event of a disaster such as an earthquake., if you must leave your home, you should very seriously consider provisions for leaving your pets behind. They should be confined to a basement, garage or bathroom. Leave only friendly dogs together. Never leave cats with dogs, even friendly dogs. Do not leave pets in a car with windows closed. The most important task is to provide water. Dogs and cats adapt well to deprivations of food, but not water. Fill a tub or several buckets. Tie any vessel so that it cannot be tipped over. It may be better to leave no food than to leave food which will spoil. It is probably best to leave only dry pet food, low in protein and fat.

General Family Preparedness

Disasters can affect any part of the United States anytime of the Year, swiftly and without warning. Most people do not think of a disaster until it is too late; then they suddenly realize how unprepared they are for the massive changes it makes in their lives. Local officials can be overwhelmed and emergency response personnel may not be able to reach everyone who needs help right away.

Each type of disaster requires clean up and recovery. The period after a disaster is often very difficult for families, at times as devastating as the disaster itself. Families that are prepared ahead of time can reduce the fear, confusion and losses that come with disaster. They can be ready to evacuate their homes, know what to expect in public shelters and how to provide basic first aid.

Family Disaster Supply Kit

One of the first steps toward preparedness is the creation of a Family

disaster supply kit. This will help families get through the First few days after a disaster. Public shelter after a disaster may not offer some basic necessities. The development of a kit will make a stay in a public shelter more comfortable, should it be necessary. Store the kit in a convenient place known to all family members. Store items in airtight bags or containers.

Replenish the kit twice a year. Include Water, Food, First Aid Kit, Tools, Supplies, Clothing, Bedding, and Special Items.

Water

Store water in clean plastic containers such as thoroughly washed and rinsed soft drink bottles with tight fitting screw-on caps. Store 1 gallon per day per family member (Two quarts for drinking, two quarts for food preparation / sanitation). Children, nursing mothers and ill people will need more. A 3-day supply of water should be stored for every family member. Replace water every 6 months.

Food

Store at least a 3-day supply of non-perishable food. Select foods that require no refrigeration, preparation or cooking and little or no water. If you must heat food, pack a can of sterno. Rotate these foods into the regular diet frequently to keep the supply fresh.

In a disaster supply kit include:

- Ready-to-eat canned meats, fruits and vegetables
- Canned juices, milk, soup (if powdered, store extra water)
- Staples such as sugar, salt, pepper.
- High energy foods such as peanut butter, jelly, crackers, granola bars, and trail mix.

First Aid Kit:

- 2-inch and 4-inch sterile gauze pads (4-6 of each)
- Hypoallergenic adhesive tape
- Triangular bandages (3)
- 2-inch and 3-inch sterile roller bandages (3 rolls each)
- Scissors
- Tweezers
- Needle
- Moistened towelettes
- Antiseptic
- Thermometer Tongue blades (2)
- Sunscreen
- Tube of petroleum jelly or other lubricant
- Assorted sizes of safety pins

Cleansing agent/soap
Latex gloves (2 pairs)
Non-prescription drugs
Aspirin or nonaspirin pain reliever
Anti-diarrhea medication
Antacid (for stomach upset)
Syrup of Ipecac (use to induce vomiting if advised by the Poison Control
Center)
Laxative
Activated charcoal (use if advised by the Poison Control Center)

4. Tools and Supplies:

Various tools and supplies may be needed for temporary repairs or personal
needs.

Include these items in your disaster supply kit:
Battery operated radio, Flashlight and extra batteries,
Non-electric can opener, utility knife,
Map of the area (for locating shelters)
Cash or traveler's checks, change
Fire extinguisher: small canister, ABC type
Tube tent
Pliers, Tape, Compass, Matches in waterproof container,
Aluminum foil, Plastic storage containers, Plastic sheeting, Signal flare,
Paper, pencils, pens, Needles, thread, Medicine dropper, Shut-off wrench, to
turn off household gas and water, a Whistle,
Mess kits or paper cups, plates and plastic utensils
Emergency preparedness manual
Toilet paper
Soap, liquid detergent2
Feminine hygiene supplies
Personal hygiene items
Plastic garbage bags, ties (for personal sanitation uses)
Plastic bucket with tight lid
Disinfectant
Household chlorine bleach

5. Clothing and Bedding
Your disaster supply kit should include at least one complete change of clothing and footwear per person. Items to include are:
Sturdy shoes or work boots
Rain gear Blankets or sleeping bags
Hat and gloves
Thermal underwear
Sunglasses
6. Special Items
Family members may have special needs. Other items you may add to your kit
include:

For Babies:
Formula
Diapers
Bottles
Powdered milk
Medications
For Adults:
Heart and high blood pressure medication
Insulin
Prescription drugs
Denture needs
Contact lenses and supplies
Extra pair of eye glasses Entertainment
Games and books
Important Family Documents:
Keep these in a waterproof, portable container.
Wills, insurance policies, contracts, deeds, stocks and bonds
Passports, social security cards, immunization records
Bank account numbers, Credit card account numbers and companies
Inventory of valuable goods, important telephone numbers
Family records (birth, marriage, death certificates)

4-Step Family Preparedness Plan
In addition to your family disaster supply kit, develop a family preparedness plan. This plan needs to be known to all family members. A basic preparedness plan has four steps:
Do your homework, Create a family disaster plan,
Make a checklist and periodically update it, Practice and
maintain your plan. Do your homework! Find out what disasters could happen in
your area. Contact your local emergency management or civil defense office and
American Red Cross chapter to learn which disasters are possible where you live
and how these disasters might affect your family. Request information on how to
prepare and respond to each potential disaster. children's school or day-care
center, as well as other places where your family spends time. Develop a list
of important telephone numbers (doctor, work, school, relatives) and keep it in
a prominent place in your home. Ask about animal care. Pets may not be allowed
inside shelters because of health regulations. Create a family disaster plan
Discuss with your family the need to prepare for disaster. Explain the danger
of fire, severe weather (tornadoes, hurricanes) and floods to children.
Develop a plan to share responsibilities and how to work together as a team.
Discuss the types of disasters that are most likely to occur and how to
respond. Establish meeting places inside and outside your home, as well as

outside the neighborhood. Make sure everyone knows when and how to contact each other if separated. Decide on the best escape routes from your home. Identify two ways out of each room. Plan how to take care of your pets. Establish a family contact out-of-town (friend or relative). Call this person after the disaster to let them know where you are and if you are okay. Make sure everyone knows the contact's phone number. Learn what to do if you are advised to evacuate. Make a checklist and periodically update it. Post emergency telephone numbers by phones (fire, police, ambulance, etc.). Teach your children how and when to call 911 or your local EMS number for help. Show each family member how to turn off the water, gas and electricity at the main valves or switches. Teach each family member how to use a fire extinguisher (ABC type) and have a central place to keep it. Check it each year. Install smoke detectors on each level of your home, especially near bedrooms. Conduct a home hazard hunt. Stock emergency supplies and assemble a disaster supply kit.

Learn basic first aid. At the very least, each family member should know CPR, how to help someone who is choking and first aid for severe bleeding and shock.

The Red Cross offers basic training of this nature. Identify safe places in your home to go for each type of disaster. Check to be sure you have adequate insurance coverage.

4. Practice and maintain your plan

Test children's knowledge of the plan every 6 months so they remember what to do. Conduct fire and emergency evacuation drills. Replace stored water and food every 6 months. Test your smoke detectors monthly and change the batteries once a year. And... In conjunction with the preparedness plan, working with neighbors can save lives and property. Meet with neighbors to plan how the neighborhood could work together after a disaster until help arrives. Members of a neighborhood organization, such as a home association or crime watch group, can introduce disaster preparedness as a new activity. Know your

neighbors' special skills (medical, technical) and consider how to help neighbors who have special needs, such as disabled and elderly persons. Make plans for child care in case parents can't get home.

Preparing Children for Disaster

As you develop your preparedness plan, include children in the planning process. Teach your children how to recognize danger signals. Make sure they know what smoke detectors and other alarms sound like. Make sure they know how and when to call for help. If you live in a 9-1-1 service area, tell your child to call 9-1-1. If not, check your telephone directory for the number.

Keep all emergency numbers posted by the phone. Help your children make preparations for People with disabilities. People with disabilities may need to take additional steps to prepare for disaster. If you are disabled or know someone who is, the following precautions should be taken. Ask about special assistance that may be available to you in an emergency. Many communities ask people with disabilities to register, usually with the fire department or emergency management office, so needed help can +be provided quickly in an emergency. If you currently use a personal care attendant obtained from an agency, check to see if the agency has special provisions for emergencies (e.g. providing services at another location should an evacuation be ordered).

Determine what you will need to do for each type of emergency. For example, most people head for a basement when there is a tornado warning, but most basements are not wheelchair accessible. Determine in advance what your alternative shelter will be and how you will get there. Learn what to do in case of power outages and personal injuries. Know how to connect or start a back-up power supply for essential medical equipment. If you or someone in your household uses a wheelchair, make more than one exit from your home wheelchair accessible in case the primary exit is blocked. Consider getting a medic alert system that will allow you to call for help if you are immobilized in an

emergency. Store back-up equipment, such as a manual wheelchair, at a neighbor's home, school or your workplace. Avoid possible hazards by fastening shelves to the wall and placing large, heavy objects on the lower shelves or near the wall. Also hang pictures or mirrors away from beds. Bolt large pictures or mirrors to the wall. Secure water heaters by strapping them to a nearby wall.

Special Preparations for the Hearing Impaired

Deaf or hearing impaired individuals will have a more difficult time communicating after a disaster. People may not realize you can't hear warning signals and instructions, and may leave you behind. If there is a power failure, your teletypewriter will be useless, and communicating in the dark will require a flashlight. To avoid potential problems you should:

Make sure you have a flashlight, pad and pencil by your bed at home. Ask a neighbor to be your source of information as it comes over the radio. Remind co-workers that you can't hear an evacuation order. If you are trapped in a room, knock on the door or hit objects together to let others know you are there.

Special Preparations for the Visually Impaired

Blind or visually impaired individuals will have a difficult time after a disaster if surroundings have been greatly disrupted. In addition, seeing eye dogs may be too frightened or injured to be reliable. Have an extra cane at home and work, even if you have a seeing eye dog. If you are trapped, make noise to alert others. Also keep in mind that, if electricity fails, blind people can assist sighted people and potentially save lives.

Evacuation Procedures

Evacuations during a disaster are a common event. Evacuation procedures vary by location and disaster. Contact your local emergency management or civil defense office for specific evacuation plans. The amount of time you will have

to evacuate depends on the disaster. Some disasters, such as hurricanes, may allow several days to prepare. Hazardous materials accidents may only allow moments to leave. This means that preparation is essential since there may not be time to collect the basic necessities. Evacuations can last for several days. During this time you may be responsible for part or all of your own food, clothing and other supplies.

Preparing for Evacuation

Advance planning will make evacuation procedures easier. First, you should have your family disaster supply kit and plan ready. Additional steps that can aid preparedness include:

1. Review possible evacuation procedures with your family. Ask a friend or relative outside your area to be the check-in contact so that everyone in the family can call that person to say they are safe. Find out where children will be sent if they are in school when an evacuation is announced.

2. Plan now where you would go if you had to evacuate. Consider the homes of relatives or friends who live nearby, but outside the area of potential disaster. Contact the local emergency management office for community evacuation plans. Review public information to identify reception areas and shelter areas.

3. Keep fuel in your car's gas tank at all times. During emergencies, filling stations may be closed. Never store extra fuel in the garage.

4. If you do not have a car or other vehicle, make transportation arrangements with friends, neighbors or your local emergency management office.

5. Know where and how to shut off electricity, gas and water at main switches and valves. Make sure you have the tools you need to do this (usually pipe and crescent or adjustable wrenches). Check with your local utilities for instructions.

Evacuating

When you are told to evacuate there are four steps you need to take:

1. If there is time, secure your house. Unplug appliances.In a flood hazard area, store propane tanks or secure them safely to the structure. Turn off the main water valve. Take any actions needed to prevent damage to water pipes by freezing weather, if this is a threat. Securely close and lock all doors, windows and garage.

2. Follow recommended evacuation routes. Do not take shortcuts, they may be blocked.

3. Listen to the radio for emergency shelter information.

4. Carry your family disaster supply kit.

Returning Home After the Disaster

1. Do not return until the local authorities say to do so. There may be leaking gas or other flammable materials present. Use battery-operated flashlights for light. If you suspect a gas leak, do not use any kind of light. The light itself could cause an explosion. If you smell leaking gas, turn off the main gas valve at the meter. If you can open windows safely, do so. Do not turn on lights they can produce sparks that may ignite the gas. Leave the house immediately and notify the gas company or the fire department. Do not reenter the house until an authorized person tells you it is safe to do so. Notify the power company or fire department if you see fallen or damaged electrical wires. If any of your appliances are wet, turn off the main electrical power switch in your home before you unplug them. Dry out appliances, wall switches and sockets before you plug them in again. Call utility companies for assistance. Check food and water supplies for contamination and spoilage before using them. Wear

sturdy shoes when walking through broken glass or debris, and use heavy gloves when removing debris. After the emergency is over, telephone your family and friends to tell them you are safe.

When Disaster Strikes

Hopefully you will never have to experience disaster. When it does happen, however, try to remain calm and patient and put your family preparedness plan into action. You should follow the following steps:

Retrieve your disaster supply kit. Wear protective clothing and sturdy shoes.

Confine or secure pets to protect them. Go to the safe place in your home you identified and stay there until well after the disaster is over. Listen to your battery-powered radio for news and instructions. Evacuate, if advised to do so.

The Role of Government After a Disaster

After a preliminary damage assessment report has been completed, the governor of a state can request a major disaster or emergency declaration from the president.

Declaration of an Emergency.

The president can issue a Declaration of Emergency to supplement the state and local effort to save lives and protect property. The president can act only after a state governor has requested a Declaration of an Emergency be issued. Total assistance provided in any given emergency declaration may not exceed $5 million.

Declaration of a Major Disaster.

A major disaster declaration may be requested by the governor to the president after a natural catastrophe occurs. Assistance is offered to both

the public and private sectors. With the declaration, the Federal Emergency Management Agency (FEMA) has the authority to engage the services of 12 federal departments, two agencies, one commission, one corporation and one authority offering 97 different Federal assistance programs. These 97 programs provide many different services to help people and state and local governments deal with recovery from a disaster. A listing of the main agencies that provide assistance can be found in General Family Preparedness, Insurance and Resources After a Disaster.

Emotional Recovery After a Disaster

In addition to the physical damage a disaster brings, stress and emotional disequilibrium need to be addressed by victims. Steps you can take to reduce the effects of a disaster include:

Be extra patient. Keep in mind that other people may have a different viewpoint about what should be top priority. Realize that it will take time to restore things, both physically and emotionally for them to express disbelief, sadness, anger, anxiety and depression. Also realize that these emotions and moods can change unexpectedly.

Helping Children Cope After a Disaster

Children may require special attention after experiencing a disaster. Four common fears children have are death, darkness, animals and abandonment. In a disaster children may experience any or all of these. You should encourage children to talk about what they are feeling and to express this through play, drawing or painting.

A child's reaction to a disaster may vary depending on age, maturity and previous experience. In all cases it is important to acknowledge what happened and take time to talk with children about their fears. Some behaviors you may find children exhibiting after a disaster include:

Being upset at the loss of a favorite toy, blanket, teddy bear, etc.

Hitting, throwing or kicking to show their anger and frustration.

Fear of the disaster coming again.

Fear of being left alone or sleeping alone. They may want to sleep with another person.

Behaving as they did when they were younger, including wetting the bed, sucking their thumb, wanting to be held, etc.

Exhibiting symptoms of illness such as nausea, fever, headaches, not wanting to eat, etc.

Becoming quiet and withdrawn. Becoming easily upset.

Feeling that they caused the disaster in some way.

Feeling neglected by parents who are busy cleaning up or rebuilding.

Refusing to go to school or to be out of the parent's sight.

Parents and other adults can help children come to terms with their feelings in several ways. Let children know you love them and they can count on you. Reassure them that they are not responsible for what occurred. Talk with your children about your own feelings. Give simple, accurate answers to children's questions, Hold them. Close contact assures children you are there for them and will not abandon them. Let children grieve for a lost toy or blanket that was special to them. It will help them cope with their feelings. Provide play experiences to relieve stress. Repeat assurances and information as often as you need to; do not stop responding. Spend extra time putting children to bed at night. Listen to what children say. Repeat their words to clarify what they are feeling. If additional help is needed for adults or children, contact a

community resource such as a counseling center, minister or mental health agency.

Food Safety

Food safety precautions can make an important difference after a disaster occurs. Food can become contaminated as a result of fire, flood and wind related exposure. It also may spoil or become unsafe after a power outage.

Precautions Against Power Outages

If your area comes under an advisory that may lead to prolonged power outages (hurricanes, prolonged flooding, etc.) take these steps to help keep your food safe:

Turn your refrigerator and freezer to the coldest setting. This will help the food stay frozen. Purchase a 50-pound block of dry ice. This will keep food in a full 18 cubic foot freezer safe for 2 days. Wrap it in brown paper for longer storage. Separate it from direct food contact with a piece of cardboard. Fill partially filled freezers with crumpled newspaper to reduce air currents which will dissipate dry ice. After a Power Outage if you should lose power, the emergency food supplies in your family disaster supply kit will be safe. Food in the refrigerator and freezer may be in trouble. Generally, food in a refrigerator will be safe if the following measures are taken. Group meat and poultry to one side, or on a tray, so their juices won't contaminate other foods if they begin to thaw. Be wary of using meat, poultry and foods containing milk, cream, sour cream or soft cheese. Don't rely on odor or appearance of food. If perishable food has been at room temperature for more than 2 hours, discard it. In an emergency the following foods should keep at room temperature (above 40 degrees F) a few days. Discard anything that turns moldy or has an unusual odor or look. Butter, margarine, Fresh fruits and vegetables, Dried fruits and coconut, opened jars

of salad dressing, peanut butter, jelly, relish, taco sauce, barbecue sauce, mustard, catsup, olives, Hard and processed cheeses, Fruit juices, Fresh herbs and spices, Flour and nuts, Fruit pies, Bread, rolls, cakes and muffins.

Discard the following foods if kept for more than 2 hours above 40 degrees F.

Raw or cooked meat, poultry and seafood Milk, cream, yogurt, soft cheese, Cooked pasta, pasta salads, Custard, chiffon or cheese pies, Fresh eggs, egg substitutes, Meat topped pizzas, lunchmeats, Casseroles, stews or soups, Mayonnaise and tartar sauce, Refrigerator and cookie doughs, Cream filled pastries, Refreeze thawed foods that still contain ice crystals or feel cold.

Tornado and Wind Related Contamination

If you live in an area that has sustained tornado or wind damage, take the following measures. Drink only approved or chlorinated water. Consider all water from wells, cisterns, and other delivery systems in the disaster area unsafe until tested. Check foods and discard any containing particles of glass or slivers of other debris. Discard canned foods with broken seams.

Flooded Food Recovery

Flood waters may carry contaminants such as silt, raw sewage or chemical waste. Disease bacteria in the water also can contaminate any food it touches. If you have experienced flood conditions, follow these guidelines:

Save undamaged commercially canned foods (except as noted later). Do not use home-canned foods that have been covered with flood water. Commercial glass jars of food are safe if the containers are sanitized (except as noted later).

Remove the labels from jars and cans and mark the contents on can or jar lid with indelible ink. Paper can harbor dangerous bacteria. To sanitize jars, cans, dishes and glassware, wash in a strong detergent solution with a scrub brush. After washing, immerse them in a solution of 2 teaspoons chlorine

bleach per gallon of room temperature water. Air dry before using. If needed, clean empty glass also may be sanitized by boiling in water for 10 minutes. To sanitize metal pans and utensils, boil in water for 10 minutes. Discard wooden and plastic utensils, baby nipples, pacifiers and any other porous nonfood items that are used with food.

Discard the following foods:

Meat, poultry, fish and eggs, Fresh produce, Preserves sealed with paraffin, Unopened jars with waxed cardboard, seals such as mayonnaise and salad dressing, All foods in cardboard boxes, paper, foil, cellophane or cloth, Spices, seasonings and extracts, Home-canned foods, Opened containers and packages of Flour, grain, sugar, coffee and other staples in canisters or dented, leaking, bulging or rusted cans.

Food Safety After a Fire

Food after a fire may be exposed to toxic fumes that contaminate food. Discard any type of food stored in permeable packaging such as cardboard or plastic wrap.

Discard raw food outside the refrigerator. Food in refrigerators and freezers also may be contaminated. The seal on these appliances is not completely airtight. Discard any food with an off-flavor or smell. The chemicals used to fight fires contain toxic material that can contaminate food and cookware.

Throw away foods exposed to the chemicals used in fire fighting. Chemicals cannot be washed off the food. This includes foods stored at room temperature, as well as foods stored in permeable containers such as cardboard and screw-topped jars and bottles.

Sanitize canned goods and cookware in the same method as recommended for flooded foods.

Insurance and Resources After a Disaster

Most homeowner policies offer coverage for losses due to natural disasters except flooding. If you are unsure what your policy covers, check it before a

disaster happens. Contact your agent for clarification if you are still unsure.

In general most insurance policies cover:

Your house, rental units that are part of the building and any attachments to the building, such as the garage. Structures on the grounds that are not attached to the house, such as a pool, gazebo, tool shed, etc. This also includes the lawn, trees and shrubs on the property. Vacant land you own or rent, with the exception of farmland. Cemetery plots or burial vaults you may own. Personal possessions, including those of members of your household and guests, and contents of the house. This does not include the possessions of tenants in your home. Any items that have been loaned to you, or given for safe keeping. Living expense if your home is unlivable due to damage. Rental payments, if you rent one part of your house but it is unlivable due to damage.

Responsibility for unauthorized use of your credit cards, forged checks or counterfeit currency accepted in good faith. Settlement, medical expenses and court costs brought against you for bodily injury of others or damage to the property of others. Most homeowner policies DO NOT cover loss due to flooding.

You should check to see if your community participates in the National Flood Insurance Program. If you need financial assistance, programs are available.

Programs include:

The American Red Cross...offers emergency assistance for groceries, new clothes, medical needs and immediate building repairs.

Farmers Home Administration(FmHA)...offers agricultural loans only when other credit is not available. Qualifying farmers can get short, medium or long term loans, with moderate interest.

Federal Crop Insurance Corporation (FCIC)...Farmers can insure crops for 50, 65 or 75 percent of yield. Unavoidable losses due to any adverse weather conditions including drought, excessive moisture, hail, wind, hurricanes, tornadoes and

lightning are covered. Unavoidable losses due to insect infestations, plant diseases, floods, fires and earthquakes also are covered. You must have this insurance prior to the disaster.

Small Business Administration (SBA)...offers medium- and long-term loans for rebuilding non-farm homes and small businesses with moderate interest rates.

Commercial and federal land banks offer loans for home repair and improvement, land, equipment and livestock. Insurance companies offer long-term loans at relatively high interest for the same things. Assistance also may be available through a variety of state or local agencies and volunteer groups. Listen to your battery operated radio after a disaster for information on disaster relief services and locations.

Non-financial resources like The Agricultural Stabilization and Conservation Service (ASCS)...for information on livestock and wildlife feeding, production and conservation practices.

The Animal and Plant Health Inspection Service (APHIS)...offers technical assistance on animal and plant pests and diseases.

Extension Service-USDA...offers information, educational material and advice on cleanup.

The Food Safety Inspection Service (FSIS)...can be reached toll free at (800) 535-4555 for questions on the safe handling of meat and poultry.

Special Post-Disaster Considerations

Restoring Flooded Water Systems

Do not start submerged electric motors until they have been cleaned, dried and checked for safety. Disconnect the motor. An ejector or jet pump motor may be a separate unit mounted on the pump, or the end bell of the motor may be part of the pump. The separate motor unit can be disconnected and serviced easily.

With the second type, remove the pump and motor as a unit. It is not necessary to remove the drop pipes. Take the motor to an electrical repair shop. In the shop, the motor should be checked for any short circuits or grounding caused by moisture. If the motor was submerged in mud and water, it should be thoroughly cleaned. Windings should be dried in a drying oven. The bearings should be lubricated before you use the motor again. Clean and dry electrical controls and pressure switches. Check all wiring for short circuits. Pumps usually are damaged by sediment deposited in the bearings. Clean pumps. Check valves for silt and sand. Remove all dirt and water from the gears in the gear box and replace the lubricant with fresh oil.

Submersible pumps. The bearings on water lubricated pumps will not be damaged by flood waters, since these bearings are constantly submerged in water. As soon as possible, flush clean water down the casing to remove the sediment and silt. Then disinfect the well.

Centrifugal pumps.

Many centrifugal pumps contain two sets of oil-lubricated bearings along the drive shaft between the motor and the pump. If the pump has been flooded, dismantle the container bracket and remove the bearings. Clean the bearings, or install new bearings if the old ones are worn out. Close-coupled centrifugal pumps contain no bearings, so there is little chance of flood damage except to the electric motor.

Injector-type pumps.

These pumps usually contain watertight packing at the ground surface, with sealed impellers. Flood waters probably will not damage this type of pump. The storage tank and piping should be all right unless muddy water was pumped through it. If tank is contaminated, disinfect the entire system with a strong chlorine solution. Use 1 quart household laundry bleach or check with local

health department for recommended solution strength. Open all faucets while the system is being filled. Do not close the spigot until a definite smell of chlorine is evident. Do not use the system for 24 hours. Then start the pump and run water from all faucets until the chlorine odor is gone. Wells probably will not be damaged structurally from floods, but they may be contaminated.

Have your well tested by health officials before you use the water after sterilizing the walls of the well casing. Leave it there at least 4 hours, or preferably overnight. Pump the chlorinated water into the piping system, and leave it there for at least 2 hours or even overnight. The next day, pump and flush out the system until the taste and odor of chlorine are no longer apparent. Two days after you have disinfected the water system take a sample of water according to recommended procedures and have it tested for purity.

Boil or treat all drinking water until a water test indicates that water is safe for all purposes. Do not drink water from a flooded cistern until you disinfect the cistern and the entire piping system. To disinfect the cistern:

Use an auxiliary pump to remove the water and empty the cistern. Do not pump water through the pipeline distribution system. Wash down the walls and ceiling with clean water, and pump out the dirty water with an auxiliary pump. Check the cistern walls, ceiling and floor for cracks where groundwater could come in. Disinfect the interior with a solution of 1 quart laundry bleach in 3 gallons of water. Be sure the bleach contains no soap. Apply the chlorine solution with a sprayer or scrub with a stiff broom. Swab or pump out the disinfecting solution that collects in the bottom of the cistern. Leave the chlorine solution in the pipes for at least 2 hours (overnight if possible) before you drain them. Fill the cistern with water for use. This water will have a chlorine taste for awhile, but it will be safe for all purposes.

Regenerate water softeners before you use them. Use clean chlorinated water to backwash the filterbed.

Disinfecting Wells

Disinfect flooded wells before they are used as a source of drinking water. To disinfect a well:

1. Scrub the pumproom and wash all equipment, including piping, pump and pressure tank.

2. Remove the well seal at the top of the casing. Pour a solution of 1 quart laundry bleach and 3 gallons of water into the top of the well. Pour the solution so it washes down the inside of the casing and the outside of the drop pipes. In some wells you will need only to remove a plug from the seal to pour the solution into the well.

3. Leave the solution in the well about 4 hours. Then pump it into the pressure tank and distribution system.

4. Draw the chlorinated water into all piping by opening each faucet until the odor of chlorine is apparent. Leave the chlorine in the piping at least 2 hours. Then run the water until the taste and odor are no longer objectionable.

Disposing of Animal Carcasses

1. Prompt and sanitary disposal of animal carcasses is necessary to protect the living animals in an area from disease.

2. Search all pastures for dead animals as soon as possible. Carcasses may have some commercial value, so send them to a rendering plant if possible.

3. If rendering is impractical, dispose of the dead animals on the premises. Use the following procedure: Immediately after finding a carcass, cover it with crude oil or kerosene to keep away dogs, buzzards and vermin. Fat swine are the only animal carcasses that will burn satisfactorily. Used railroad ties can be used as starters. Bury other carcasses. Use power equipment if it is available. Choose a site where subsurface drainage will not reach water supplies. Bury the

carcasses at least 3 to 4 feet deep so predatory animals won't get at it.

Drought
Water Conservation
Water conservation is defined as the efficient use of water so that unnecessary or wasteful uses are eliminated. In many areas, more groundwater is drawn out of the aquifers each year than is recharged through rainfall and stream flow. As a result, groundwater levels have dropped dramatically. Demand for water from a state's streams and reservoirs may rapidly approach the available long-term supply.

Across many states, many communities are regularly required to limit water use at some time during the year. While some additional water supplies can be developed by constructing new reservoirs, in many locations the demand for water will still equal or exceed the available long-term supply. For these towns and cities, water conservation can make the difference between adequate supplies and shortages. Importantly, the way water is used and, in some instances, wasted must be rethought. This section explains easy ways that water can be conserved and money can be saved at the same time. Useful information is also provided on how to measure home water use, how simple repairs can be made, and how water-saving devices are installed. In addition to the measures found in this section, also refer to the General Family Preparedness section found at the beginning of this handbook. Water conservation at home, there are dozens of ways to conserve water and save money around the home. As a starting point, To determine whether a low-flow showerhead needs to be installed, check the flow rate of the current showerhead by using the water meter or by putting a gallon container under the showerhead while the water is on and measuring the time it takes to fill the container at the usual shower setting. If it fills in less than 20

seconds, the flow is greater than 3 gallons per minute. Low-flow showerheads can be purchased at most department, hardware and plumbing stores. Models costing from under $3 are available. A showerhead can usually be installed in 10 minutes.

Place displacement devices in the toilet. Three types of displacement devices can be used in toilets, but they should not be used in newer, low-water use toilets which use less than 3« gallons per flush. To determine the capacity of the toilet tank, either turn off the water supply valve to the toilet (usually located on the pipe behind the toilet) or hold the float ball up so that the tank does not refill, and flush the toilet. Measure the capacity of the tank by filling it to the normal level with a gallon container. Toilet dams can be installed in toilet tanks to reduce the amount of water used, typically saving « to 2 gallons per flush. Toilet dams are available from many utilities or from most plumbing supply stores from under $5 per pair. A plastic bottle filled with water and weighted down with a few stones can accomplish the same purpose as dams. It is important to place the bottle in the toilet tank where it will not interfere with the flushing mechanism. A plastic bottle in the tank will save « to 1 gallon per flush. A toilet bag which is available free of charge from many utilities, can also be used in place of dams. A displacement bag in the tank will save « to 1 gallon per flush. Bricks should not be used in the tank because small pieces can break off and permanently damage the plumbing system.

Install faucet aerators. The standard faucet flow rate is 5 gallons a minute. A low-flow aerator can reduce this flow to approximately 2« gallons a minute while still providing adequate water for washing and rinsing. Installing aerators on the kitchen sink and lavatory faucets will save hot water and cut water use by as much as 60 gallons a month for a typical family of four. Most

aerators have either internal or external threads. Before purchasing aerators, the location of the threads and the diameter of each spout should be determined. If the faucet already has a standard aerator (not a low-flow type), it can be removed and taken to the store to ensure that the correct low-flow size is purchased. Aerators are available for less than a dollar from most stores that sell plumbing fixtures.

Water Conservation

If the kitchen has a portable dishwasher that must be connected to the faucet, do not install a low-flow aerator because the reduced flow may affect the performance of the dishwasher and result in dishes that are not properly cleaned.

Change your water use patterns. The washing machine and dishwasher should only be used when fully loaded. This practice can save at least two loads or approximately 60 gallons each week. Examine personal water use habits. Changing tooth brushing habits can save as much as 14 gallons of water to water utilities, leaks can easily account for 10 percent of a water bill and waste both water and energy if the source is a hot water tap.

Toilet Leaks.

When a toilet leaks, water escapes from the tank into the bowl. Toilets are notorious for hidden or silent leaks, because leaks are seldom noticed unless the toilet "runs" after each flush (which can waste 4 to 5 gallons a minute). To determine if the toilet is leaking, look first at the toilet bowl after the tank has stopped filling. If water is still running into the bowl or if water can be heard running, the toilet is leaking. Often the toilet may have a "silent leak." To test for a silent leak, mix a few drops of food coloring or place a dye capsule or tablet (available from many utilities and hardware stores) into the water in the toilet tank after the water has stopped filling and the tank is full. Do not flush the toilet. Wait for about 10 minutes, and

if the dye or food coloring appears in the toilet bowl, the toilet has a silent leak. Leaks of this type usually are caused by a defective flush valve (flapper) ball or a corroded or scaled valve seat. Replacement balls and valves, which can be installed in less than 30 minutes, are available from most hardware and plumbing stores for under $3.

Faucet Leaks.

Faucet leaks are obvious. However, periodically check seldom used taps in the basement or outside the house. The cause of faucet leaks is frequently a worn washer that can be replaced with two or three hand tools. Replacement washers can be purchased from most hardware and variety stores and cost only a few cents.

Use efficient outside watering practices. Plant native vegetation.

Once established, which usually takes two years, these plants require less frequent watering. Water grass only when needed. If grass springs up after being walked on, it does not need watering. Soak grass long enough for water to reach the roots. Water slowly and deeply. Water during the cool, early morning hours to minimize water loss by evaporation and discourage disease. Do not water on windy days. Use sprinklers that produce droplets instead of mist and that have a low trajectory. This type of sprinkler will lose less water by evaporation and be less affected by the wind. Use drip irrigation systems for shrubs, flowerbeds and other frequently watered areas. During the summer, keep the grass about 2 to 3 inches high. This height shades the root system and holds soil moisture better than does a closely clipped lawn. Do not water streets and sidewalks. Adjust the hose or sprinkler until it waters just the grass or shrubs. For flowerbeds, shrubs and trees, use drip or soaker systems.

Reading a Water Meter To Measure Leaks

If your house has a water meter, the entire plumbing system can be checked for an undetected leak in five easy steps:

1. Find the water meter. (It may be outdoors or hidden in a dark corner of the basement.)

2. Turn off all running water and water-using appliances, and do not flush the toilet.

3. Read the dial (or dials) and record the reading.

4. After 15 to 20 minutes, re-check the meter.

5. If no water has been turned on or used and the reading has changed, a leak is occurring. The rate (gallons per minute) of the leak can be determined by dividing pipe. This is often the case when the neck ends in a ball joint. Most necks can be unscrewed and replaced, or an adaptor can be used. Adapters or replacement necks are readily available in plumbing and most hardware stores.

When installing the new showerhead, teflon tape or pipe joint compound could be applied to the exposed threads of the new neck so that the joint will be sealed and provide a leakproof connection. If the shower neck has been on for a few years and the neck joint is too stiff to unscrew with moderate pressure, consider having a plumber replace it.

Installing Shower Flow Restrictors to Conserve Water

Restricting devices fit into the space between the showerhead and the shower neck. These devices range from a simple washer with a small hole in it to small chrome-plated pressure compensating fittings. While restrictors reduce water flow, low-flow showerheads produce a flow that is more satisfying to most individuals.

Installing Toilet Dams, Toilet Bags and Plastic Bottles to Conserve Water

Many of the toilets in homes today use from 5 to 7 gallons per flush. Several effective retrofit devices are available that can reduce the volume of water used with each flush by 2 to 3 gallons. While these devices can be used

in some of the low-flush toilets on the market today that use from 3 to 4 gallons per flush, they generally perform better when used in the older 5- to 7-gallon per flush models.

The height of water in the toilet tank (not just the volume) causes the bowl to flush, so the purpose of displacement devices is to reduce the volume of water used in each flush without affecting water height in the tank. The following three types of devices have proven to be effective.

1. Toilet Dams:
To install a dam, flex or bend the dam and insert it into the tank. The dam should fit tightly against the tank sides and bottom and should curve outward away from the plumbing fixtures in the tank. Most tanks work best when a single dam is used.

2. Toilet Bags:
Fill the bag with water, securely seal the top of the bag with the bag clamp and hang the bag in the tank by using the bag clip and hanger that are provided. Make sure the bag is located in the tank so it does not interfere with the operation of the toilet tank.

3. Plastic Bottles:
Fill a plastic bottle with water and weight down with a few stones, and place in the most open portion of the tank. This will save as much water as is displaced by the bottle. Make sure the bottle does not interfere with the operation of the moving parts of the tank. Check all such devices periodically to ensure that they remain in place.

Water Saving Steps When Remodeling or Replacing Fixtures and Appliances

1. Hot Water Pipes.
Where possible, insulate hot water pipes from the hot water heater to fixtures and appliances. This will reduce the time between turning the water on and the time hot water comes out of the faucet and reaches a constant temperature.

2. New or Replacement Fixtures and Appliances.

Install low-water use fixtures when remodeling or replacing fixtures. Install toilets that use 3« gallons or less per flush. Install low-flow showerheads that flow at 3 gallons or less per minute. Install water-saving dishwashing and clothes-washing machines. Be sure to check the water efficiency of appliances when shopping for replacement appliances.

3. Pools and Hot Tubs.

Simple repair steps that can be done without contacting a plumber are listed below.

1. If the water is too high in the toilet tank and is spilling into the overflow tube, the float can be adjusted by turning the adjustment screw or by very gently bending the float arm down so that the water shuts off at a level slightly below the top of the overflow tube. Ideally, the water level should be set so that it is about even with the fill line on the back of the toilet tank.

2. A frequent problem that causes a toilet to leak is a worn flapper ball or a flapper ball that does not seat properly into the valve seat. If the flapper ball is worn, it can be removed and replaced with a new flapper ball. When replacing a flapper ball, take care to note how the chain is adjusted before the old ball is removed. Also, check the valve seat for scale or corrosion and clean if necessary. If cleaning does not work, install a retrofit valve seat, available from most plumbing or hardware stores.

3. If the handle needs to be jiggled to keep the toilet from "running," the guide-wire or the handle itself may be sticking. If the handle is sticking, adjust the nut that secures it in the toilet tank. If that does not work, replace the handle.

4. If none of the preceding steps solve the problem, contact a plumber to repair the toilet.

Repairing Faucet Leaks

1. Leaky faucets, which can develop even in new houses, are wasteful and a nuisance. With a few simple tools, a leaky faucet can be repaired in less than an hour.

2. Most water faucets in houses today are compression-type units in which a washer is compressed over a pipe opening when the faucet is closed, thus closing off the water. All compression-type faucets may not look alike, but all are similar in their operation and repair.

3. The exact point where a leak appears on a faucet is a good clue to finding its cause:
A spout drip is usually caused by a worn upper faucet washer or a corroded seat.
Leaks at the stem result from a loose cap nut or worn cone or bonnet packing.
A cap leak, or water oozing below the cap nut, indicates a worn bib or packing washer. A leak at the base of the faucet results from water seeping past a worn lower faucet washer.

4. To repair a leaky compression type faucet, use the following steps:
Turn off the water supply at the valve nearest the faucet. Next, open the tap to drain the faucet. Remove the handle screw and lift handle off the spindle.
Unscrew the cap nut. Use a protective cover of adhesive tape or a rag to avoid marring the finish. Unscrew the stem with finger pressure and lift it out.
Remove the screw from the bottom end of the spindle. Scrape away all worn washer parts. Be careful not to damage the rim. Install a new washer. (Take either the old washer or the complete spindle unit with you to purchase the correct size and shape (flat or conical) replacement washer.) Double-check to make sure the replacement is like the worn washer. Check the seat (which is located down inside the faucet) to make sure it is not pitted or rough. If the seat is scarred or rough, use a seat-dressing kit to grind the seat to a smooth finish. A leak at the stem usually means that the packing inside the cap nut

needs replacing. To replace the packing, pry out the old packing washer with a screwdriver. If a washer is used, replace it with a new one. If there is no washer, wrap the spindle tightly with "packing wicking." String can be used if commercial wicking is not available. Reassemble the faucet. Tighten the cap nut just enough to prevent leaking. Screwing the nut down too tightly causes rapid wear on the stem. Turn the shutoff valves to the on position and check the faucet for leaks.

5. A mixing faucet may look more complicated than a single faucet, but repairs are made in much the same way. Actually, a mixing faucet is two separate units with a single spout. Mixing faucets are used on sinks, bathtubs and laundry tubs. Repairs must be made separately on each faucet unit. Follow the same steps listed above, but remember to turn off the water before beginning work.

6. Every washerless and single-lever faucet model is a little different. When repairs are required, homeowners can purchase a repair kit for their model which includes instructions and the parts that generally will be worn. By replacing all the parts at once, the faucet should function for several years without needing further repair.

Adding New Landscape Or Redesigning The Yard To Conserve Water

When planning to add new landscaping or to redesign existing landscaping, the following suggestions may help you to save 50 percent or more of the water needed to maintain a traditional lawn.

1. If hiring a landscape architect or gardener, select one who is experienced in Xeriscape, the conservation of water and energy through creative landscaping.

2. Design the yard to reduce the grassed areas to only that amount which will actually be used for recreation and entertainment. Front and side yards are

most frequently just for show and are logical areas that can be completely or partially converted from lawns to native grasses, ground covers and shrubs.

3. Use native grasses, ground covers, shrubs and trees. Many beautiful varieties of native species can be used in landscaping and are preferable to imported species. The advantage of native species is that, once they are established (usually about 2 years), they do not need to be watered as frequently (about half as often), and they can survive a dry period without any watering.

4. When installing an irrigation system for lawn, shrubs and trees, sprinkler heads for the lawn should be low-angle spray heads that sprinkle the grass without spraying the water high into the air or allowing the water to drift onto the sidewalks and streets. The heads should produce droplets of water instead of a mist. The preferable irrigation system for shrub beds and trees is a drip-type system. There are several varieties, including soaker hoses, bubblers and "leaky pipe." If a sprinkler system is installed for shrubs, an upright pipe extension may be needed if low-angle spray heads are to be used. This is done to spray evenly without obstructions.

5. Shape the soil to protect against erosion and use conditioners to promote water penetration and retention. Shape the soil into earthen basins around all shrubs.
If the original soil is rocky, shallow or a heavy clay, improve the soil by adding 2 to 4 inches of organic material or topsoil that is compatible with the soil type.

6. Watering needs vary:
Plants: During summer month, most plants will need about 1 inch of water every 5 to 7 days.
Lawns: The frequency of watering depends on the type of grass.

Landscape Water Conservation
A water conscious landscape design can reduce water use for landscape

maintenance by 50 percent or more and also reduce the amount of maintenance required. Of equal importance, the natural beauty and function of the landscape also can be preserved by using adapted plant materials.

1. By using plant materials adapted to specific areas, water needs for landscape maintenance can be reduced by more than 50 percent. Water conscious landscaping involves more than just using adapted plant materials it includes the use of other conservation techniques and practices. Water saving practices include the use of low pressure drip or trickle irrigation systems for watering trees, shrubs, gardens and individual plants or beds; the use of mulches around shrubs, beds and gardens to conserve water; the use of bark, rock or other landscape material in ground cover in areas difficult to water or in areas where plants are not needed; the use of vegetative groundcovers such as ivy, jasmine, liriope and vinca in small, isolated areas, sloping sites that are difficult to water and in heavily shaded sites.

2. Water conscious landscape designs minimize intensively maintained lawn space. Manicured lawn areas may be the focal point of the landscape, but they do not need to cover the entire area unless the lawn is used as a playground or sports field. Highly maintained grass areas generally require more irrigation than any other component of the landscape. On golf courses, for example, only the landing areas need to be intensively maintained. Rough areas may have a more drought tolerant grass, taller mowing heights and a separate water system. Large open areas of the landscape where a grass cover is needed can be planted to low maintenance grasses such as buffalograss, centipede grass or bahiagrass. Native plants and wildflowers also can be allowed to develop in these areas. Such plantings require very little maintenance and no supplemental water once they become established.

3. Proper site preparation will produce a more beautiful landscape and result

in more efficient water utilization. Slopes, areas with shallow topsoil, compacted soils and deep sands are difficult sites to establish grass and are inefficient with respect to water use. Modifying or amending the sites before planting is more effective than waiting until problems develop.

4. As the foundation is the strength of a building, the seedbed is the support for a turf. The seedbed refers to the few surface inches of soil that are modified prior to planting. Poor soil conditions result in continuous turf maintenance problems. To prepare a seedbed, first remove all debris such as large stones, wood or other trash that may sawdust (preferably hardwood), leaf mold or similar material. Thoroughly mix 1 inch of organic matter with the top 3 to 4 inches of soil to produce a uniform seedbed. This mixing can be done by repeated cultivation with a garden tiller or with a tractor and rotovator. When adding un-decomposed organic matter to the soil, also add 3 pounds of ammonium nitrate or 5 pounds of ammonium sulfate per 1,000 square feet to aid decomposition of the organic material. Most soils are deficient in the major nutrients required for turf. Sandy soils normally are deficient in nitrogen, phosphorus, potassium and lime.

In the black land areas, nitrogen and phosphorus may not be adequate for good turf development. Potassium in the soil may become deficient for turf growth when high amounts of nitrogen are used in areas not normally deficient in potassium.

If possible, base rates and combinations of fertilizer nutrients on the results of soil tests. In the absence of a soil test, apply a complete fertilizer to the surface of the seedbed. Apply a fertilizer with a 1-2-1 (10-20-10, 6-12-6) or 1 (8-8-8) ratio at a rate to supply 1 pound of phosphorus per 1,000 square feet of lawn. Grade the seedbed to provide surface drainage away from structures, walks and driveways. A fall of 6 inches for every 40 to 50 surface feet is adequate for drainage on sandy soils, provided no pockets or depressions exist. Clay or clay loam soils may require twice that slope to

provide adequate surface drainage. In some cases, subsurface drainage systems may be needed to remove excess water from poorly drained sites. If a considerable part of the landscape needs to be filled, use a loam or sandy loam soil. Repeated wetting of the filled site will help settle the soil. The final step in seedbed preparation is raking the surface to remove large clods and stones. At the same time, fill depressions that have developed and level high spots. Walks and driveways should be about 1 inch above the final soil surface. The site is now ready to be seeded, sprigged or sodded.

5. Conservation and reduced maintenance costs are enhanced by good cultural practices. By some estimates as much as 50 percent of the water used for landscape maintenance is wasted through run-off and evaporation. Proper timing and method of application will reduce much of this water loss. The most important water conserving practice is to water only when grasses show symptoms of water stress. Grasses wilt and begin to go off color when under moisture stress. Shrubs and small trees wilt and begin to drop their leaves under moisture stress. Ideally, water shrubs before the first sign of moisture stress. When water is needed, thoroughly wet the soil 4 to 6 inches deep by applying water slowly or at intervals to avoid run-off. One inch of water, properly applied, will wet most soils 4 to 6 inches deep. (One inch of water is equivalent to 62 gallons per 100 square feet.) During summer months an inch of water will meet most plant needs for 4 or 5 days. But wait until the plants (or grass) show moisture stress before watering again. Early morning dew, cooler temperatures or rain may extend the interval between irrigations several days.

6. Mowing is the key to maintaining neat, attractive turf areas. Low maintenance grasses such as buffalograss require lrecycle plant nutrients. When clippings are picked up, they can be composted or used for mulch in gardens. During hot, dry conditions raise mowing heights to reduce water needs. Grass mowed at 2 to 3 inches maintains a deeper root system than grass mowed at

1 inch. Supplemental water needs are reduced with more effective use of water in the soil by deep rooted grasses. Mow St. Augustine, bluegrass and tall fescue lawns at 3 inches during drought conditions. Do not mow bermudagrass and zoysia higher than 2 inches.

7. Thatch, the organic layer between the soil and the green leaves, can slow water movement into the soil and cause excess run-off. Thatch accumulation results from heavy fertillizing, improper mowing practices, over watering and frequent pesticide use. Aeration and thatch removal increase water penetration and reduce run-off. Under some conditions wetting agents (surfactants) improve water penetration in a heavily thatched lawn. Water movement into the root zone is even more difficult where compaction develops. Aeration of compacted soils once or twice a year helps break up the compacted layer and increases water penetration. Aeration also reduces run-off from sloping sites.

8. In soils containing high levels of sodium salts, gypsum can aid water penetration. Soil test information available through county Extension agents can reveal the presence of high levels of sodium. Like the other three factors affecting water use, the quality of the water used can influence the amount of water needed to keep a turf healthy. Where salt is a problem, it is important to thoroughly wet the soil during each application. Light, frequent applications of water high in salts result in an sccumulation of salts near the surface. Thorough watering helps move the salts below the root zone of grasses.

Watering Lawns and Plants During a Drought

1. If water is rationed during a drought, give priority to shrubs that are more expensive and harder to replace than grass and annual plants.

2. During a severe drought when outside watering is prohibited, water plants with "gray water" saved from bathing, dishwashing and clothes washing, if this is permitted by the city or local health department.

Special Considerations for Agricultural Producers

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

Developing a Crop Water Management Plan

Develop a water management system before you are faced with a drought situation.

1. Water Use Efficiency

In areas where water supply is limited or expensive, it is economically important for farmers to attain high water use efficiency as well as high yields. Water use efficiency values can be calculated in several ways and should be clearly defined to avoid misinterpretation. Water use efficiency for a crop and irrigation system can be expressed as crop yield (pounds) per unit of water applied to or actually used by the crop (acre-inches).

2. Rainfall Patterns

Average monthly rainfall data can be misleading because large variations occur. Therefore, percent probability that a certain rainfall amount will occur is a better way of assessing risk. Dryland crops should be grown during periods of high rainfaing widely practiced on drought tolerant crops to take advantage of expected rainfall.

1. Sorghum

Sorghum has good ability to adjust to water stress. Sorghum requires 13 to 24 inches of seasonal water use (evapotranspiration) from precipitation, stored soil moisture and irrigation to achieve grain yields of 3,000 to 6,700 pounds per acre.

Dryland sorghum yields an average of about 1,600 pounds per acre, although yields of up to 3,000 pounds per acre are not uncommon during high rainfall years. Pre-plant irrigation is often not needed and may be inefficiently

applied, especially when using conventional graded furrow irrigation systems.

The same amount of water may be more efficiently used if applied at later stages of crop growth.

Conservation tillage can reduce the need for pre-plant irrigation of sorghum through improved soil moisture storage. Irrigations should be timed to avoid water stress during periods of peak water use (boot, heading and flowering stages) to achieve reasonably good yields and maximum irrigation water use efficiency. Two well-timed seasonal irrigations of 4 inches per application or the equivalent are adequate in normal years for good yields of medium maturity hybrids. Saving irrigation water by withholding a 4-inch rrigation reduces sorghum grain yields by only about 10 percent during the early 6- to 8-leaf stage but by almost 50 percent if withheld at the heading and bloom stage.

2. Corn

Corn is much more sensitive to water stress than sorghum, wheat or cotton.

Corn is planted earlier than sorghum and typically allows more efficient use of the May-June wet season than sorghum. The early planting date required for corn increases the need for pre-plant irrigation for stand establishment. The total seasonal water use to achieve any corn grain yield is about 13 inches.

Pre-plant irrigation is often necessary. Drought seasons require one or two additional irrigations. Moisture stress caused by low soil water availability or hot, dry conditions during the flowering stage (which includes tasseling, silking and pollination) can severely restrict corn yield. Reduced irrigation of corn has generally resulted in significant yield decreases. Planned water deficits into the stress range are not recommended and may be feasible only on soils with moderate to high water storage and during the early vegetative or grain ripening stages. Reduced acreage, rather than reduced irrigation, offers the best way to

adjust corn irrigation to limited water supplies.

3. Wheat

Winter wheat is a major drought-tolerant crop that grows vegetatively during the normal dry period from fall to early spring and develops grain during a period of increasing spring rainfall. Wheat is normally planted around October 1 and requires available soil moisture from irrigation or precipitation for germination and early growth. Wheat also should receive one late fall irrigation followed by two to three spring irrigations for high grain yields. One additional early irrigation (together with additional applied fertilizer) is usually needed for early planted wheat that is grazed and also managed for grain production. The highest wheat yield response to irrigation, deficits and application.

Early fruit set is important in cotton production. However, the production, placement and retention of fruiting sites are sensitive to soil water availability. Under dryland conditions, expected lint yields are in the range of 250 to 300 pounds per acre. Cotton requires more than 13 inches of seasonal water use to produce appreciable lint yields. High levels of water application can decrease lint yield by causing excessive vegetative development and fall immaturity. A pre-plant irrigation of 4 inches is usually advantageous, especially if spring rainfall is not adequate, but heavier pre-plant irrigations are not warranted. Cotton has the ability to overcome moisture stress at most growth stages if water becomes available and low temperatures do not limit growth. The most critical period for irrigation is early to mid-bloom. If water is available, a second irrigation should be applied at peak to late bloom.

Developing and Improving Vegetative Cover

1. Good cover (standing vegetation and mulch) lessens the impact of rain that dislodges soil particles, and thus reduces the amount of sediment in surface

run-off. Good cover also slows the movement of run-off so that more water soaks into the soil and more sediment is deposited on the grazing land rather than being carried into streams or ponds. Vegetative cover also entraps manure and prevents pollution of streams with animal waste.

2. Best management practices for preventing nonpoint source pollution from grazing lands include locating animal holding pens and feeding areas away from streams and other hydrologically sensitive areas, and establishing and maintaining good vegetative cover.

3. The amount and type of vegetation present significantly influence the rate of infiltration of water. Standing vegetation and a mulch or litter layer increase infiltration. Organic matter in the surface soil improves soil aggregation, making it easier for water to move through the soil.

4. Pores in the soil created by plant roots increase the rate at which water can enter the soil by providing pathways for water movement. Long-lived, perennial bunchgrasses have deeper root systems than sodgrasses and allow water to move deeper.

5. The height of grass also affects water movement. Water moves more rapidly across closely grazed grass than grasses left with several inches of stubble.

6. If the watershed has been severely overgrazed, the vegetative cover will need to be improved by controlling undesirable plants such as broadleaf weeds and shrubs and/or seeding desirable plants.

Maintaining Vegetative Cover

1. If at least 10 to 15 percent of the desirable vegetation is present, the most practical and economical way to maintain a desirable vegetative cover is through proper grazing management. The key to proper grazing management is to balance

the number of grazing animals with the forage produced. The proper balance will leave a sufficient amount of plant residue to maintain stored food reserves, plant vigor, a healthy root system and seed production of the desired plants. It also allows seedlings to become established.

2. For planning purposes, an appropriate long-term stocking rate may be determined based on the "take half and leave half" rule of thumb. However, a more realistic approach is to manage the grazing stocking rate so that a given amount of residue is left prior to resumption of growth in the spring. The amount of residue required will vary according to the area of the state and the vegetation types. For example, 300 pounds of plant residue may be adequate for a semi-arid area with short-grass vegetation, while 1,200 pounds of residue may be required in a more humid area with tall-grass vegetation.

3. It also is important to properly distribute animals over the grazing land. Poor distribution may result in extreme overgrazing of one area and little use of another in the same unit. Often these overgrazed areas are located near water, thus increasing the potential for pollution. Practices which contribute to proper grazing distribution include the development and strategic placement of water sources, construction of fences, strategic location of salt and feeding sites, building of trails, fertilization, prescribed burning and spot seeding.

4. Plants benefit from periods of no grazing. Deferment from grazing is particularly useful on areas where vegetation needs to be improved.

5. Planned grazing systems divide an area into two or more grazing units to allow periods of grazing and rest from grazing in a sequence determined by management

objectives, physiological needs of the plants and the design of the system.

Grazing systems may include as few as 2 or as many as 30 or more grazing units.

Some temporary soil compaction may occur with systems that concentrate animals in a small area for short periods of time. However, if the period is short, the soil will recover rapidly from the compaction. A planned grage plants and water quality.

Managing Salinity

Salinity problems normally occur in arid or semi-arid climatic regions.

Salinity is a major nonpoint source pollutant in the west as irrigation return flows can carry dissolved salts into waterways. In humid climates, soluble salts are generally eached downward through the soil profile where they cannot cause problems.

In general, accumulation of salt results from water evaporation at the soil surface. This condition can render land vegetatively nonproductive, and may lead to nonpoint source pollution through erosion and sedimentation. Further, the salt concentration may run off during a storm and affect adjacent lands.

These problems normally occur where either surface seep areas appear or where a high water table exists in the soil profile. Sometimes rainfall moves through the ground to the water table or to a barrier above the water table. Here it accumulates and moves laterally, often parallel with the land slope, toward an outlet or low point in the landscape. It then forms a wet weather or saline seep. During the summer or periods of low rainfall, such seepage spots may completely dry out. Only detailed analyses of borings, soils and surveys can establish the source and amount of groundwater contributing to seep areas.

1. Irrigated land in arid areas sometimes must be drained to prevent or

reduce salinity problems. Topographic surveys and subsurface investigations should be made to obtain information on the soils, geology and water table elevations. These data are the basis for determining the extent of the problem and for setting design parameters.

2. Plant nutrients and pesticides should be applied in such a manner as to limit the potential for contamination of surface and groundwater supplies by outflow from drainage systems.

3. One alternative treatment is to establish permanent salt tolerant species such as bermudagrass, aikali sacaton, gramas and kleingrass. Salt tolerant species will allow a vegetative cover where bare ground would otherwise lead to water quality problems.

4. Cropping with salt tolerant, seasonal species such as cotton or small grains assists in addressing the problem of saline soils. Planting high water use crops such as alfalfa, four-wing saltbush or trees above a seep area helps control the amount of moisture that accumulates.

5. Organic or inorganic additives to the soil surface will increase water infiltration. This will allow water to force dissolved salts below the root zones and prevent further concentration of salts on the soil surface. Organic amendments include cotton burs and gin "trash" that may be obtained from cotton processing facilities. Inorganic agents to increase soil tilth include gypsum or calcium sulfate.

6. Land alterations are sometimes used to alleviate salinity problems. Such constructed systems have a place in salinity control, but use caution when implementing them. In some cases, altering the land surface by smoothing or

grading may eliminate the effects of the problem by confining the seep area or providing natural surface drainage. Practices such as closed-end terraces or basin terraces which impound water can be used on areas with minimal seepage, but should be scrutinized where they might contribute to problems associated with salinity of the site.

7. A surface drainage system may be the least expensive alternative, but potential maintenance problems and obstructions to farming operations should be onsidered. Maintaining water quality of any discharge waters is of utmost importance. Most subsurface drainage uses corrugated plastic tubing installed with a synthetic filter envelope. Again, as with any other drainage system, an adequate outlet is imperative, especially considering the discharge water quality in comparison to receiving waters.

8. Irrigation water management is important on saline soils. Salt accumulates in soils because of salts in irrigation water or the presence of a high water table. To prevent harmful accumulation of salts in soils irrigated with saline water, an additional quantity of water, above that required for the crop, must be passed through the root zone to leach salt from the soil. A high water table contributes to salt accumulation because capillary action causes water and soluble salts to rise to the soil surface. There the water evaporates, leaving behind salt deposits. Enough water must be applied periodically to leach out accumulated salts without excessive waste of water. If a seep area could be made worse by applying liquid agricultural waste, proper management must be used, including nutrient management.

Earthquakes

The crust of the earth is made up of seven masses called tectonic plates.
They are in steady motion. Accumulated stress builds up from the continental plates grinding, sliding or colliding against or slipping under each other.
Pressure is released in a powerful explosion of energy that fractures the earth's surface, shakes the ground, causes the ground to roll, liquefies some soil and generates giant water waves. When an earthquake will unleash its force remains unpredictable.
Preliminary cracks may send off foreshocks before a main fracture. These foreshocks can occur months or minutes before the rapid onset of the earthquake. An earthquake lasts for seconds or minutes, while aftershocks may occur for months after the main earthquake. Powerful and widespread ruptures or shaking ground can cause buildings to move off their foundations or collapse; damage utility lines, other structures and roads; set off fires; and threaten the lives of people and animals. It is the damage to structures that presents the greatest risks to life and property.

Earthquakes create a trigger for other natural hazards such as landslides, tsunamis, avalanches, fires and flash floods. The greatest likelihood of major earthquakes is in the western United States, particularly along the San Andreas Fault in California and up the Alaskan Coast, in the New Madrid Fault Zone in the Midwest, and in a few pockets on the East Coast, particularly in South Carolina and New England. There is no seasonal or yearly cycle of occurrence.
Earthquakes can happen at any time. Major earthquakes appear to occur in cycles of between 50 and 275 years. Earthquakes are measured in intensity of ground vibrations, the elasticity of buildings and tructures, and how well structures are connected to their foundation, falling or collapsing objects and structures accompany earthquakes. Structural instability, such as dam failures, can trigger flash

floods. Fires have been the greatest cause of damage in the past. Offshore earthquakes may cause tsunamis.

Preparing for an Earthquake

In addition to precautions outlined in the sections on General Family Preparedness, Residential Fires and Hazardous Material Accidents, you need to take the following steps.

1. Become familiar with earthquake terms.

Aftershocks: Tremors that occur in the hours or days after the initial earthquake shaking is over.

Epicenter: The place on the surface of the earth directly above an earthquake's first movement (focus).

Fault: A fracture in the earth's crust along which rocks have been displaced.

Focus: The point beneath the surface of the earth where the rocks first break and move, beginning the earthquake.

Intensity: An indication of an earthquake's apparent severity at a specific location, based on its effects on people and structures.

Magnitude: Size of an earthquake determined from the size of the seismic waves it generates as recorded by seismographs.

Mercalli Scale: The scale used to measure the strength of an earthquake as determined by people's eyewitness observations.

Tidal wave: This is a misnomer for a tsunami. Tidal waves occur from the interaction of the moon and large bodies of water. Waves you see rolling into the ocean shore every day are tidal waves. Tsunami: A seismic sea wave. An unusually large wave (or series of them) produced by an undersea earthquake or volcanic eruption.

2. Safeguard your home by:

Bolting bookshelves, water heaters and cabinets to wall studs. Anchoring things so that they will not move or fall during an earthquake is the most important thing you can do to make yourself safe. Keeping things in place also means they will not break.

3. There are many ways to make the contents of your home and workplace less hazardous. Move cabinets and tall furniture so that if they fall they are not likely to hit people. Use steel angle brackets to anchor them to studs in the wall. Put heavy or breakable things on bottom shelves. You can even put "fences" or restraining wires to keep items from falling off open shelves. Put child-proof or swing-hook latches on bathroom and kitchen cabinets. At work, put strong latches on cabinets where hazardous items are stored. Use screw-eyes or tongue-in-groove hangers to mount mirrors or pictures instead of hanging them on nails.

Preparing for an Earthquake

Be sure that ceiling fans and light fixtures are well anchored or have earthquake safety wiring. Anchor typewriters, computers, televisions, stereos and like items with heavy duty Velcro, at home and at work. Strap your water heater to anchor it to wall studs. You can buy metal strapping, called plumber's tape or strap iron, in hardware stores. Use it to strap the heater at the top and bottom. This not only preserves your best source of water but also significantly reduces the fire hazard in your home by preventing a broken gas line. Do not assume that anything is too heavy to move in an earthquake. When the ground is going up and many injuries occur when people act on their impulse to run. Train yourself to take cover where you are.

Responses Inside Buildings During an Earthquake

For most of us the biggest danger in an earthquake is not from a building collapsing, but from things inside the building falling or flying around while

the building is shaking. Hazards found inside buildings include overhead lights, ceiling tiles, cabinets, windows, furniture and equipment.

If an earthquake happens, the best thing to do is:

1. Drop, cover, and hold on. Get under a table. If there are no tables, get under or down between rows of chairs or against inner walls.

2. Do not stand in a doorway. Buildings today have so much partitioning, much of which is temporary, that many doorways are actually weak points. Doorways are not a good solution in a group situation either.

3. If you have nothing to get under, sit down against an interior wall or next to a chair, holding on if possible.

4. If you are in bed, it's best to stay there, hold on, and pull the pillows over your head for protection.

5. If children are in another room, take cover in the closest safe place and call to them to do the same. Children will need you alive and unhurt after the earthquake. Avoid the urge to run to protect your children, as that puts you in more danger of being hurt or injured.

Responses if You are Outside During an Earthquake

1. Outside, get away from buildings, walls, trees and power lines. If you cannot get clear of hazards, getting back inside a building is better than staying on the sidewalk. Sidewalks next to buildings are among the worst places to be.

2. In a car, ease off the accelerator and slow down carefully. Do not stop on or under overpasses and bridges if you can avoid them. Be aware of what traffic around you is doing and act accordingly.

3. If you live in coastal areas, be aware of possible tsunamis.

After an Earthquake

1. Take basic precautions immediately after an earthquake. In addition to those outlined in the General Family Preparedness, Residential Fires and Hazardous Materials Accidents sections you should:

Expect aftershocks. Avoid using vehicles except in emergencies.

2. Check yourself for injuries and protect yourself by putting on shoes, work gloves and any other protective gear at hand.

3. If the electricity is off, turn on a flashlight.

4. Once you are sure that you're all right, check the people around you for injuries. You might ask loudly, "Is everyone okay?" This will also help calm people. The types of injuries that happen most often in an earthquake include cuts, bruises, fractures and physiological shock.

5. Check the entire building for structural damage and chemical spills. Refer to the section on Hazardous Materials Accidents for further response information. Check chimneys for cracks and damage. The initial check should be made from a distance. Have a professional inspect the chimney for internal damage that could lead to fire.

6. Right after an earthquake, hang up your phone. If the receivers are shaken off the hooks, these lines register as "open" in the system and it overloads. You can help restore telephone service by hanging up your phone.

Special Considerations for Agricultural Producers

In addition to animals right after an earthquake. Aftershocks are quite frequent after large earthquakes, and further increase the fear and skittish reactions of animals. The best thing to do for animals after an earthquake is to get them out in the open, to open pasture or rangeland. Let the animals run free. Do not attempt to rope or chain large animals such as cows and horses because they may injure or kill themselves if an aftershock occurs and they try to run. Get animals out of barns or buildings that may have been damaged in an earthquake. Barns are especially susceptible to earthquake damage. Large beams and rafters may not be well secured, thus making the barn subject to collapse during aftershocks. Hay bales and large equipment may be tossed around and come tumbling down on animals and people inside barns. Immediately open the doors and let the animals out. It's easier to recover a live animal than replace a dead one. Ensure that mechanical equipment has not been turned over or damaged. If there is danger of electrical shock, turn off the main electrical circuit breaker or fuse. If you smell gas or suspect a gas leak, turn off the main valve. Check fence lines and posts. You may need to build a make-shift yard from temporary posts and fencing. Then repair/ rebuild the regular fencing, and open the temporary yard when completed. If animal carcasses need to be disposed of refer to the General Family Preparedness, Special Post-Disaster Considerations section for appropriate handling.

Residential Fires

Fire safety and prevention are important for everyday emergencies, but they are crucial during disasters. More than 6,000 Americans die and 100,000 more are injured by fires each year. Fire spreads quickly. A fire's heat is more dangerous than the flames; inhaling super hot air can sear your lungs. Fires produce poisonous gases that make you drowsy and disoriented. In addition to those measures outlined in the General Family Preparedness section, the following fire specific measures should be followed.

Fire Safety and Prevention

1. Install smoke detectors in your house or apartment. Place detectors on every level of your house: outside bedrooms at the top of open stairways or the bottom of enclosed stairs - near (but not in) the kitchen. Clean smoke detectors regularly and replace batteries once a year.

2. Plan escape routes with your family. See the General Family Preparedness section of the Handbook.

3. Clean out storage areas. Don't let trash accumulate.

4. Check electrical wiring. Inspect extension cords for frayed or exposed wires or loose plugs. Do not overload extension cords or outlets.

5. Never use gasoline, benzine, naptha or similar liquids indoors. Never smoke near these flammable liquids. Safely discard all rags or materials soaked in flammable material after use.

6. Check heating sources. Make sure they are clean and in working order.

7. Alternative heating sources such as wood, coal and kerosene should be used carefully.

8. Make sure that home insulation is not in contact with electrical wiring.

9. Know where your gas meter and central electrical panels are so you can shut them off in an emergency. If you shut off your gas line, allow only a gas company representative to turn it on again to make sure it is done properly.

10. Ask your local fire department to inspect your house for fire safety and prevention.

11. If you live in wildland areas, your house could be a target for wildfire. Call local authorities and get information about wildfires in your area.

Do not install an untreated wood shake roof. Make your landscape fire safe by removing excess brush and undergrowth, planting fire resistant plants, and pruning trees of low branches.

What to Do in Case of a Fire

1. To put out a small fire, take away its air or fuel, or cool it with water or fire extinguishing chemicals.

2. Never use water on an electrical fire. Use only a fire extinguisher.

3. Oil and grease fires occur primarily in the kitchen. Smother the flames with baking soda or salt or put a lid over the flame if it is burning in a pan.

4. Small fires can be controlled with water or fire extinguishers, but do not try to put out a fire which is getting out of control.

5. If your clothes catch on fire, stop, drop and roll until the fire is extinguished. Running only makes the fire burn faster.

6. Sleep with your door closed. If you wake up to the sound of a smoke detector, feel the door before you open it. If the door is cool, leave immediately. Be prepared to bend low or crawl. Smoke and heat rise, and the air is cooler near the floor. If the door is hot, escape through a window.

After

1. Ask your insurance agent about estimates and loss coverage.

2. Do not enter a fire-damaged building unless authorities have given you permission.

3. When entering a building, be watchful for signs of heat or smoke because they may be signs of smoldering remains of fire.

4. Have an electrician check your household wiring before the current is turned back on. Do not attempt to reconnect any utilities yourself.

5. Beware of structural damage. Roofs and floors may be weakened and need repair.

6. Discard food, beverages and medicines that have been exposed to heat, smoke or soot.

7. If you have a safe or strong box, do not try to open it. A safe or fire proof box can hold intense heat for several hours. If the door is opened before the box is cooled, the entering air combined with the high internal temperature may cause the contents to burst into flames. Refer also to the General Family Preparedness section.

Floods

Floods are the most common and widespread of all natural hazards. Some floods develop over a period of days, but flash floods can result in raging waters in just a few minutes. Even very small creeks, gullies, culverts, dry streambeds or low-lying ground that may appear harmless in dry weather can flood. Wherever you live, be aware of potential flooding hazards. If you live in a low-lying area, near water or downstream from a dam, you must be prepared for floods. In addition to the information provided here, also refer to the General Family Preparedness section.

Preparing for Floods and Flash Floods

Some simple advance preparation will help you be ready for possible floods in your area.

1. Know the flood warning system in your community and be sure your family knows the warning. Instruct family members in emergency procedures during a flood warning. If you live in an area subject to frequent or sudden floods, especially flash floods, you may wish to have family flood drills. Assign each family member an emergency task such as gathering emergency supplies, turning off utilities, or listening to the radio for instructions.

2. Flood proof your buildings. Install check valves in sewer traps to prevent

water
from backing up in sewer drains. Seal cracks in walls and floors with hydraulic
cement.

Watch for these these fire hazards on your property:

- Broken or leaking gas lines
- flooded electrical circuits,
- submerged furnaces or electrical appliances
- flammable or explosive materials coming from upstream.

5. Before floodwaters crest, turn off the main power switch if you think the
electrical circuits are going to be under water. Never Touch The Switch While
You Are Wet Or Standing In Water. Do not turn the electrical system back on
until it has been inspected by an electrician.

6. Know what a river height forecast means for your property especially how far
your property is above or below expected flood levels.

7. Know where to go in case of flooding. Remember that you must seek higher
ground as quickly as possible, on foot if necessary.

8. If you are camping, know how far your campsite is above nearby waterways.

Know how to seek higher ground. Stay out of unknown water paths such as dry
creeks or river beds. If advised to leave the area, do so immediately.

9. Refer to the General Family Preparedness section of this Handbook for
additional steps to take.

Building Dikes To Prevent Minor Surface Flooding

Standing water from melting snow or heavy rains can flood basements and
damage yards, wells, feed supplies, machinery and other property. Flooding is
more apt to occur in areas with poor surface drainage systems or ice dams. A
1- to 3-foot high sandbag earth dike offers protection from shallow flooding
(water depth less than 3 feet). Contact a construction firm, lumber yard or
Civil Defense officials for information on where to buy sandbags in the area. A

sandbag dike can be constructed as follows:

1. Select the site for the dike, making the best use of natural land features to keep it as short and low as possible. Avoid trees or other obstructions which would weaken the structure. Do not build the dike against a basement wall. Leave about 8 feet of space to maneuver between the dike and buildings.

2. Remove ice and snow (down to the bare ground if possible) from a strip of land about 8 feet wide.

3. Fill and lap sandbags. Fill bags approximately half full of clay, silt or sand. Do not tie. Alternate direction of bags with bottom layer lengthwise of dike. Lap unfilled portion under next bag. Tamp thoroughly in place. Build the dike three times as wide as it is high.

4. Seal the finished dike to increase its watertightness. To seal the dike:
Spread a layer of earth or sand 1 inch deep and about 1 foot wide along the bottom of the dike on the water side. Lay polyethylene plastic sheeting so that the bottom edge extends 1 foot beyond the bottom edge of the dike over the loose dirt. The upper edge should extend over the top of the dike. (This plastic sheeting, available from construction supply firms, comes in 100-foot rolls and is 8 or 10 feet wide.) Lay the plastic sheeting down very loosely so that the pressure of the water will make the plastic conform easily with the sandbag surface. If the plastic is stretched too tightly, the water force can puncture it. Place a row of tightly fitting sandbags on the bottom edge of the plastic to form a watertight seal along the water side. Place sandbags at about 6-foot intervals to hold damp or flooded basements.Leaks in basements may be caused by cracked walls, improper grading, water in window wells or water pressure under floors.

Cracks

Watertight concrete is important to prevent water seepage in the basement.

Fill cracks when the soil is dry, so cracks will be dry. It is best to fill cracks when there is no artificial heat in the basement so thin layers of mortar can cure.

1. Wide cracks (« inch or more). Shape the crack like a V with a star drill or cold chisel. Fill with mortar. Chisel out the sides of the crack to make a V opening about 1 inch deep and 1 inch wide at the surface. Coat the crack with a creamy mixture of cement and water. With a trowel immediately fill the opening with a 1:2 mixture of cement and sand mortar (one amount of cement to two amounts of sand mortar). Or use a chemically treated cement available at hardware or building supply stores.

2. Hairline cracks. Fill the cracks with a cement base paint. With a scrub brush apply a cement wash of Portland cement and water. Or check for other leak-stopping materials at your local lumberyard or hardware store.

3. The ground around foundations should slope away from the house at a rate of at least 6 inches in 10 feet. You should regrade by cutting and filling if you notice water standing along foundations, or if the surrounding ground is flat or slopes toward the house.

4. Carry roof water away from the building by eave gutters and downspouts. Water from downspouts should be carried about 3 feet away from the foundation wall. Use a splash block, downspouting or tile drain. Do not direct water from the downspouting into the drain around the footing.

Preventing Leaks in Basements

Window Wells

1. Check window wells to be sure that surrounding ground ends a few inches below the top of the well.

2. To prevent water seeping down the outer surface and under the well, compact

several inches of dirt around the well.

3. If there is tile around basement footing, dig a post hole inside the well to this tile. Fill with clean gravel.

4. If there is no tile around footing, improve drainage by laying drain tile from the bottom of the window well to a lower point in the yard.

Basement Floors

Water pressure under concrete basement floors may cause them to leak or buckle.

To relieve this pressure:

1. Build a sump so water can run into it and be pumped out.

2. If there is a layer of clean gravel under the floor, drill a hole in the side of a floor drain. This will allow water to flow through the gravel to the drain, and will relieve the pressure under the floor.

3. Leaks sometimes can be diverted through concrete lined channels below or above floor level. Make a channel by chipping away floor and smoothing it with mortar, or by building a ditch above floor level. Carry the channel around the wall to a floor drain.

Cleaning Up After a Flood Setting Priorities

Priorities will vary with the kind and seriousness of damage. Buildings may not be habitable during repair.

1. Examine building structure. Check foundations for settling, cracking or undermining. Examine walls, floors, doors and windows to determine what repairs are necessary. You may want to repair only temporarily until extensive work can be done.

2. If basement is flooded, start pumping the water and water system.

3. Shovel out mud and silt before it dries.

4. Before they dry, wash down flooded walls and floors with a hose. Start at upper limit of flooding and work downward.

5. Scrub and disinfect walls and floors.

6. Start the heating system if possible to speed up drying. Before operating it, the heating system may need to be cleaned, dried and reconditioned. Make sure chimneys are clean before starting system.

7. Dry out walls and floors. If necessary for proper drying, strip walls open up to water level. Drill holes in exterior siding. Complete drying may take months.

8. Repair buckled walls and floors.

9. Clean and dry household items, furniture, carpets, clothing, dishes and bedding. Disinfect when necessary.

10. Treat items for mildew as needed.

11. Care for damaged trees, shrubs and lawn.

12. Repaint, repair, refinish as necessary.

Salvaging Sewing Machines and Sergers

Most damage to flooded sewing machines and sergers is caused by rust. Even if the machine was not submerged, check for rust caused by general dampness. Rust develops quickly on highly polished, machined or plated surfaces.

1. If the equipment was submerged, the machine (head and controls) or the serger should be serviced by a dealer or professional sewing machine/serger repair person within 10 days if possible.

2. Try to prevent as much damage as possible by drying equipment quickly. Use a hand-held hair dryer to help dry interior parts. Dry attachments with a soft cloth or a hair dryer. Rinse attachments and removable metal parts in dry cleaning solvent or a light machine oil. Oil replaces water and protects the metal.

3. Oil interior parts to protect them. Put a few drops of machine oil on each moving part and operate the sewing machine or serger by hand for several minutes to distribute oil. If the equipment has been submerged, do not use the motor and

controls to operate the equipment until they have been inspected by a dealer or a repair person.

4. If the sewing machine, serger or attachments have already begun to rust, follow preventive measures as above. Then rub rusted parts with very fine steel wool and reapply a coating of oil.

5. If the equipment cannot be serviced within 2 weeks, be sure a light film of oil remains on the parts. Store equipment in a large plastic bag until serviced to protect other surfaces from leaking oil. Place a chemical dehumidifier in the bag with the machine to absorb any residual moisture.

6. If equipment and controls were not submerged, professional servicing may not be necessary. Follow rust prevention measures for metal parts and then operate the equipment with the motor. If the equipment works properly, remove excess oil from attachments and other removable parts with a soft cloth. To remove excess oil from interior metal parts and thread-handling mechanisms sew/serge through scrap fabrics until no more oil is absorbed into fabric.

Cleaning Flood-soiled Pillows and Mattresses

Mattresses

1. A good innerspring mattress should be sent to a commercial renovating company.
Renovation is too difficult to do at home. Ask about the cost of the work.

It may be less expensive to buy a good reconditioned or new mattress.

2. If a mattress must be used temporarily, scrape off surface dirt and expose mattress to sunlight to dry as much as possible. Cover mattress with a rubber or plastic sheet or mattress cover before using it.

3. If you decide to keep a flood-soiled mattress, it should be sterilized. This must be done at a sterilizing plant such as a mattress company or a state hospital. Ask your local public health department or county Extension agent for information on mattress sterilizing plants in your area. Have mattresses as dry as possible before taking them to a sterilizing plant. Use crop drying fans or household fans to speed up the drying process.

Feather Pillows

1. For feather pillows, if ticking is in good condition and does not contain red or yellow stains, wash feather and ticking together. Brush off surface dirt. Wash in machine or by hand in warm (not hot) suds 15 to 20 minutes. Use a disinfectant, following product directions for use. If using an automatic washer, wash no more than two pillows at one time. If washing by hand, rinse at least three times in clear warm water. Spin off water or squeeze out as much water as possible. Do not put pillows through a wringer. Dry in an automatic dryer at moderate heat setting. Put several bath towels in the dryer with the pillow to speed up drying. Allow about 2 hours. Or dry pillows in a warm room on a sweater drying rack with a fan on them. Shake and turn pillows occasionally to fluff feathers and hasten drying. Or hang pillows on a clothesline by two corners. Change position end to end and shake occasionally to fluff feathers and speed drying.

2. If ticking is not in good condition or is stained with red or yellow mud, wash

feathers and ticking separately. Find or make a bag of light weight, firmly woven fabric such as muslin. The bag should be two to three times larger than the ticking. Open one edge of the ticking.

Radiological Accidents

Radiation is energy in the form of waves or particles and is part of our everyday lives. Our planet receives radiation from outer space and from the sun. Other naturally occurring radioactive materials are present in the soil, in the structures where we live, and in the food and water we consume. These natural forms of radiation are referred to as "background radiation."

Radioactive materials also are a source of fuel for nuclear power plants. While the history of such plants in the United States has been generally safe, residents living near power plants should know what preparations and responses are appropriate to take in the event of a radiological accident. In addition to the information in this section, also refer to the General Family Preparedness section.

Radiation Types

The three basic forms of radiation are:

1. Alpha particles can be stopped by a single sheet of paper or a few layers of dead skin. Therefore, alpha radiation is not an external hazard. However, if the source of radiation is within the body, it is the most serious hazard, because of alpha radiation's greater biological effects on live tissue.

2. Beta particles can be stopped by a few layers of clothing, 10 feet of air or a half-inch of tissue. If beta particles are retained in the skin, they can damage living cells by causing severe skin or eye burns. They also can damage cells

in the digestive tract if particles are ingested with food or water.

3. Gamma rays are similar to x-rays and are the major radiation of concern in radiological environments. Gamma rays are deeply penetrating and can damage body cells. Although all cells are subject to damage, bone marrow cells and cells in the intestinal lining seem to be particularly sensitive. Gamma rays can be shielded to acceptable levels by sufficient amounts of materials.

Radioactive materials can be released in the form of particles or gases. Both are spread by the wind. The farther the particles travel, the lower the concentration of radioactive material. Contamination is an undesired presence of radioactive materials. In an accident that releases radiation into the environment, people, farm equipment, animals, crops and the soil can become contaminated. In addition to the following procedures, homeowners and agricultural producers also should refer to the section on General Family Preparedness.

Preparing for a Nuclear Power Plant Accident

1. If you live near a power plant, familiarize yourself with the terms used to describe a nuclear emergency. Notification of unusual event means a small problem has occurred at the plant. No radiation leak is expected. No action is necessary on your part. An Alert means a small problem has occurred and small amounts of radiation could leak inside the plant. You should not have to do anything. A site area emergency is a more serious problem. Small amounts of radiation could leak from the plant. Area sirens may be sounded. Listen to your radio or tele vision for safety information. A general emergency is the most serious problem. Radiation could leak outside the plant and off the plant site. The sirens will sound. Tune to your local radio or televistall sirens and other warning systems to cover a ten-mile area around the plant. Obtain public

emergency information materials from the company that operates your local nuclear power plant or from your local emergency services office.

What to Do in a Nuclear Power Plant Emergency

1. Keep calm. Not all incidents result in the release of radiation.

2. Stay tuned to local radio or television. Specific instructions will be given by authorities. Local instructions should take precedence over any advice given in this handbook.

3. Evacuate if you are advised to do so. See the section on Evacuation Procedures in the General Family Preparedness section. Keep car windows and vents closed; use reecirculated air.

4. If you are not advised to evacuate, remain indoors. Close doors and windows. Turn off the air conditioner, ventilation fans, furnace and other air intakes. Go to a basement or other underground area if possible. If you must go outdoors, cover your nose and mouth with a handkerchief.

5. Do not use the telephone unless absolutely necessary. All lines will be needed for emergency calls.

6. If you have just been outdoors, take a thorough shower. Change your clothes and shoes. Put the items you were wearing in a plastic bag. Seal the bag and store it out of the way. Clothes can later be washed as you normally would in the washing machine. Any contamination would remain in the water and not contaminate the washing machine.

7. Put food in covered containers or in the refrigerator. Food not previously in covered containers should be washed first.

Safety of Home Gardens After a Nuclear Accident

1. Test homegrown produce for radioactive contamination before it is consumed.

2. If you work outside make sure you: Wash hands thoroughly before eating.
Wear protective clothing that covers all portions of your body while outside.
Remove outer clothing before you go inside. Wear a dust mask or a folded, damp
cloth over your nose and mouth while you work. Avoid dust-producing activities
as much as possible.

Recovering Losses and Expenses from a Nuclear Accident

1. Nuclear power station operators are required to have insurance to cover
damages
suffered by the public. Additional living expenses, loss of farm or business
income, and physical or property damage are covered.

2. The Federal Emergency Management Agency also may provide funds for temporary
housing and home repair, as well as other types of assistance. See the section
on
General Family Preparedness for post-disaster assistance information.

Special Considerations for Agricultural Producers
In addition to the precautions and responses covered in the previous pages, the
agricultural producer will want to consider the following measures.

What to Do in a Nuclear Power Plant Emergency

1. Shelter livestock and give them stored feed if advised to do so by
authorities.
Some farm buildings provide better protection than others because of heavy
construction. Placing earth, hay, sacked feed or fertilizer, concrete blocks
or
other materials around exposed shelter walls will increase shielding
effectiveness. Make sure that adequate ventilation and wood lots offer some
protection. Cattle could be penned in cattle underpasses or bridges if
available. Cattle confined in pens shelter each other to a limited extent.
Move dairy cattle and goats indoors first because radioactive material easily
transfers to milk.

2. Do not add water to covered storage unless it is from a protected source.

3. Protect standing water by covering the surface at the outset of an emergency.

4. Cover feed to protect it from falling particles. Protect haystacks in an open field with tarpaulins, plastic sheets or similar coverings.

5. Poultry are somewhat more resistant to radiation than other farm animals. Confined shelters and use of stored feed also lower concern of contamination. The same feed, water and shelter ventilation measures taken for livestock should be followed to reduce the likelihood of contaminated egg and poultry products.

6. Swine care should follow the steps taken with other livestock. Water is a primary necessity for hogs, so sure the source is protected.

Animal Care After a Nuclear Accident

1. Limit the use of feeds to those under cover or protected from contamination. Grain in permanent indoor storage, hay in a barn and silage in a covered silo may be considered protected. Rolled bales of hay should be used only when absolutely necessary, and only if the outer layers are removed and discarded. Do not let animals graze until you are notified that forage in your area is safe. If grazing cannot be avoided, supplementing it with protected feed will limit ingested contamination. If no stored feed is available, animals can survive on water for a period. Make a special effort to prevent dairy animals from becoming contaminated by providing clean food and water. If possible, prevent cattle from drinking from ponds, lakes, rivers and streams. Spring and well water should be free of contamination.

2. If you have been evacuated and your absence is longer than the protected feed sources will last, emergency officials may allow you to reenter the area. You must conform to rules regarding emergency workers, including the use of protective equipment and instrumentation and limitation of stay.

3. It is unlikely that even a worst case event would cause the death of any animals. Any unexplained illness or death would more likely be the result of changes in routines of livestock feeding and patterns of grazing. In the event of death or illness of an animal contact your State Department of Agriculture or County Extension agent immediately to assist in diagnosis of the problem.

4. Soap and water will remove contamination from animal hides.

5. Wear protective clothing similar to that used in pesticide application.

Recovering Exposed Fruits, Vegetables and Soils

1. Fruit and vegetables may be externally contaminated by radioactive particles. normal washing of leaves, pods and fruits that are surface contaminated is effective in removing contamination. Washing should be done in a place other than the kitchen to prevent contamination of foods and dishes.

2. Underground crops absorb little radiation. Standard removal and disposal may be necessary. Planting alternative crops such as cotton or flax instead of food crops may be recommended in some situations. Deep plowing will remove radioactive substances below the plant root level and prevent plants from taking up contaminated substances.

Monitoring Fish and Marine Life

1. Fish and marine life in ponds may be harvested unless officials determine they are contaminated.

2. Samples of water, fish and marine life from open bodies of fresh and saltwater should be analyzed for contamination.

Marketing Animals and Products

1. A buffer zone, called a Food Control Area, will be established around land which may be contaminated.

2. State emergency officials will monitor milk on farms and at points on its way to market. You will be notified if sampled milk contains radioactive materials. Milk should be safe if it is from dairy animals that have been adequately sheltered and protected. There may be delays in milk pickups which will require holding milk for longer periods of time. Be prepared to provide alternate storage or some milk may have to be discarded.

3. Do not destroy animal foods unless storage has made them inedible.

4. Livestock that have been exposed to external contamination can be used for food if they have been washed well and monitored by authorities prior to slaughter. Meat animals that have internal contamination cannot be slaughtered until officials advise that it is safe to do so.

Tornadoes

Tornadoes are nature's most violent storms and can leave an area devastated in seconds. A tornado appears as a rotating, funnel shaped cloud, striking the ground with whirling winds of up to 200 miles per hour or more. A tornado spins like a top and may sound like a train or an airplane. Although tornadoes usually travel for up to 10 miles before they subside, 200-mile "tornado tracks" have been reported. Tornadoes can strike any time of the year and often accompany hurricanes. In addition to those measures listed in the General Family Preparedness section, also use the following tornado preparedness and response measures.

How to Prepare for a Tornado

1. Know the tornado season for your area.

2. Learn to recognize severe weather signs. Tornado weather is usually hot and humid with southerly winds.

3. Know what a tornado looks and sounds like.

4. Know what a tornado watch or warning is:
A Tornado Watch indicates that weather conditions may cause tornadoes or severe thunderstorms to develop in or near the watch area. A watch does not mean a tornado has been sighted. A Tornado Warning means that a tornado has actually been sighted or indicated by radar and residents should take shelter.

Special Precautions for Mobile Home Dwellers

1. When you purchase a mobile home, look for built-in safety features: Factory installed anchoring strapscate your home so the small end is directed into the direction of prevailing winds, reducing surface exposure to wind impact.

2. Encourage your neighbors to tie down, too. An unanchored mobile home blown into your home can cause extensive damage.

3. Have your mobile home blocked properly. Open concrete blocks are less expensive but are never good enough.

4. Make sure you purchase approved tie-downs.

5. Skirting your mobile home will help protect underneath the home from moisture and winter weather, as well as reduce soil heaving caused by soil thawing and freezing during winter months. Soil heaving destabilizes the mobile home, requiring retightening of the tie-downs.

6. Be aware of where designated tornado facilities or shelters are.

What to Do During a Tornado Warning

1. When a tornado has been sighted, stay away from windows, doors and outside walls. Protect your head from falling objects or flying debris. Take cover wherever you are. In a house or small building, go to the storm cellar or basement. If there is no basement, go to an interior part of the structure on

the lowest level (closets, interior hallways). In either case, get under something sturdy (such as a heavy table) and stay there until the danger has passed. In a school, nursing home, hospital, factory or shopping center, go to a designated shelter area. Stay away from windows and open spaces. In a vehicle, trailer or mobile home, get out immediately and go to a more substantial structure.

If there is no shelter nearby, lie flat in the nearest ditch, ravine or culvert with your hands shielding your head.

2. Do not attempt to flee from a tornado in a car or other vehicle.

Responses After a Tornado

1. Use great caution when entering a building damaged by high winds. Be sure that walls, ceiling and roof are in place and that the structure rests firmly on the foundation.

2. Look out for broken glass and downed power lines.

Inspecting Buildings for Hidden Wind Damage

1. Check the roof for:

Missing or damaged shingles. Loose nails on metal roofing. If nails don't hold when hammered back in, use #12 or #14 metal screws to fill old nail holes.

Potential leaks that could indicate structural separation. This is more easily checked for on sunny days.

2. Inspect the foundation to make sure that joints where the foundation and wall meet haven't separated. On stone or concrete foundations, check to see that plate bolts have not worked loose.

3. Inspect the interior of buildings for structural damage. Using a good light, check the framing. Look for ridge separation, loose knee braces and loose rafters where the rafters join the walls.

Special Considerations for Agricultural Producers

In addition to those tornado concerns listed previously, agricultural producers should inspect silos for hidden wind damage. Make sure the silo is still plumb. Look for loose hoops. Inspect the base of metal silos inside and out for hairline cracks. Remove any rust around the base with a wire brush. Look for new cracks in the plaster of empty concrete stave silos.

Volcanic Eruptions

Volcanic ash can be harsh, acid, gritty, glassy and smelly. While not immediately dangerous to most adults, the combination of acidic gas and ash which may be present within miles of the eruption can cause lung damage to small infants, very old people or those suffering from severe respiratory illnesses.

Preparing for a Volcanic Eruption

1. Follow the information located in the General Family Preparedness section of the Handbook.

2. Be familiar with terms associated with a volcanic eruption. Volcanic ash usually is erupted into the air above the volcano and then is carried downward along with volcanic gases. Pieces of ash may range from dust sized particles to pieces of rock. Ash can overload roofs, corrode metals, cause fabrics to decompose, clog machinery, block drains and water intakes and injure or kill vegetation. Lava flows are streams of molten rock from a vent or from a lava fountain. Volcanic gases associated with active volcanoes are water vapor, carbon dioxide, hydrogen sulfide, hydrogen, helium, carbon monoxide and hydrochloric acid. People with respiratory problems and heart disease are especially susceptible to volcanic gases. Gases rarely reach populated areas in lethal concentrations, although sulfur dioxide can react with the atmosphere downwind and fall as acid rain. Pyroclastic flows and surges are mixtures of hot rock fragments that

sweep away from their source at hurricane velocity. Because of their high speed and temperature, pyroclastic flows and surges kill or destroy virtually everything in their path. Volcanic landslides are not always associated with eruptions; heavy rainfall or a large earthquake can trigger landslides on steep volcanic slopes.

3. Check with your local emergency management agency to locate hazard maps of your area. Areas that could be endangered by volcanic ash, pyroclastic flows, lava flows and mud flows are identified in these maps.

During a Volcanic Eruption

1. Do not visit the volcano site; you could be killed by a sudden explosion.

2. If ash is being expelled, avoid areas downwind from the volcano. A building offers good shelter from volcanic ash but not from lava flows and rock debris.

3. Be aware of flying rocks and mudflows. The danger from a mudflow increases as you approach a stream channel and decreases as you move away and toward higher ground. Mudflows can move faster than you can walk or run. Look upstream before crossing a bridge, and do not cross if the mudflow is approaching.

4. If ash is falling, stay indoors until the ash has settled.

5. During an ashfall, close doors, windows and all ventilation in the house.

6. Remove ash from flat or low pitched roofs and rain gutters to prevent thick accumulation.

7. Avoid driving in heavy dust conditions unless absolutely required. If you must drive in dense dust, keep speed down to 35 mph or slower.

8. Avoid driving in heavy dust conditions unless absolutely required. The more dense the dust, the more urgent the requirement should be for driving.

9. When required to drive in dense dust, keep the speed down to 35 mph or lower.
Do not follow too close to cars in front of you. Use headlights on low beam.

10. Change oil often. In very dense dust, change at 50- to 100-mile intervals.
In light dust conditions, change oil at 500- to 1000-mile intervals. Lubricate all chassis components at each oil change.

11. Clean air filter by backflushing filter paper with compressed air (30 psi).
CAUTION! Blow element from inside (clean side) to outside (dirty side).
DO NOT strike filter against anything. If you are unsure, have a qualified

mechanic perform the air filter service.

12. Cover passenger compartment vent inlet (located at base of windshield and usually under hood) with thick, loosely woven, felt-type material to filter air into vehicle. With vent filter in place, keep heater blower on high. The blower will slightly pressurize the inside of the vehicle and keep dust from entering through body gaps or holes. If a vent filter is not installed, keep air conditioner and heater blowers off.

13. Have a service garage clean wheel brake assemblies every 50 to 100 miles for very severe road condition, or every 200 to 500 miles for heavy dust conditions.

14. Have a service garage clean alternator winding with compressed air after heavy dust accumulation or every 500 to 1,000 miles of severe dust exposure.

15.Wash the engine compartment with a garden hose or steam cleaner. Be sure to seal off air intakes and electrical components before cleaning.

16. Commercial truck filters can be installed to increase the filtering capacity of the air cleaner. However, this is expensive and should be attempted

only by trained garage mechanics or experienced personnel. This would be beneficial for vehicles operating continuously in extreme dust conditions.

Winter Storms

Winter storms can strike any area. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. The results can be isolation from power outages, blocked roads and cars trying to maneuver ice-covered highways. Everyone needs to be prepared to protect themselves from the hazards of winter weather-blizzards, heavy snow, freezing rain and sleet.

Preparing for Winter Storms

1. Being familiar with terminology used by the Weather Service will help you know what to expect when weather warnings are issued. The following terms are used frequently in winter weather releases: Freezing rain occurs when temperatures are below 32 degrees F and rain freezes on impact. This causes an ice coating on all exposed surfaces. If the coating is heavy, falling trees or wires can be additional hazards. Freezing rain or drizzle is called an ice storm when a substantial glaze layer accumulates. In some parts of the country, ice storms are called "silver thaws" or "silver frosts." Sleet is frozen rain drops (ice pellets) which bounce on surface impact. Sleet does not stick to objects, but sufficient accumulation can cause dangerous driving conditions. Travelers' advisory means that falling snow and/or drifting snow, strong winds, freezing rain or drizzle will make driving hazardous.

Heavy snow warnings are issued when 4 or more inches are expected during a 12-hour period, or when 6 inches or more are expected during a 24-hour period. Blowing and drifting snow result from strong winds. Blowing, falling snow or loose snow on

the ground can produce sizeable drifts. Blizzard warnings are issued when wind speeds of 35 miles per hour or more are expected with blowing or drifting snow.

Snow squalls are brief, intense snowfalls accompanied by gusty surface winds. Wind chill factor is the combined effect of wind and cold. A very strong wind combined with a temperature below freezing can have the same chilling effect as a temperature almost 50 degrees lower with no wind. Anyone who is outdoors and exposed to low temperatures and strong winds will be more easily exhausted and more subject to frostbite or death.

ø = temperature in degrees Fareneheit

Temp.	Wind 15 mph	30 mph	40 mph
30F	11øF	-2øF	-4øF
20øF	-5øF	-18øF	-22øF
10øF	-18øF	-33øF	-36øF
0øF	-33øF	-49øF	-54øF
-10øF	-45øF	-63øF	-69øF
-20øF	-60øF	-78øF	-87øF
-30øF	-70øF	-94øF	-101øF
-40øF	-85øF	-109øF	-116øF

Pay attention to weather forcasts and plan accordingly. Include food that needs no cooking in case of power failure. If power is out, keep your refrigerator and freezer doors closed as much as possible. Prevent fires by not overheating your stove, heater or furnace. Don't leave fireplaces unattended. Stay indoors during cold snaps and storms unless you are in top physical condition. If you must go out, don't overexert. Be particularly careful when shoveling snow. Heart attack is a common cause of death during and after winter storms. Remember that cold winds and temperatures put extra stress on your body even if you are in good condition. Wear several layers of loose-fitting, lightweight, warm clothing.

Layers of clothing trap warm air close to your body. You can remove clothing to prevent perspiring and subsequent chill. Outer clothes should be tightly woven, water repellent and hooded if possible. Cover your mouth to protect your lungs from extreme cold. Get your car winterized before the cold season. Use snow tires or chains. Keep the fuel tank filled to prevent water from getting into the fuel and causing the engine to stall. If you must travel when bad weather is forecast, be sure someone knows where you are going and the time you expect to arrive. Travel with someone else if at all possible. Blizzards may require long periods of isolation.

If you need outside help during this time, you should know the following emergency distress signals to signal aircraft:

Need doctor I
Need medical supplies II
Need food and water . . . . . .F
Need fuel L
International distress signal .. . . . .SOS

Make these signals on the ground where they will be clearly visible from the air. The letters should be at least 10 feet tall. Use black cloth or plastic, hay, boards or other material readily visible on the white snow. If no materials are available, tramp the letters into the snow, deep enough to create as much shadow as possible.

Notes:

Special Considerations for Travelers

When traveling any distance by car during the winter, observe these

safety precautions:

1. Before you leave, have your car checked. A thorough winterizing check should include:
Ignition system,
Battery Lights,
Snow tires installed,
Cooling system
Fuel system
Exhaust system
Heater Brakes
Wiper blades
Defroster
Tire chains and tow chains
Antifreeze Winter-grade oil

2. Select alternate routes before you leave, in case your preferred route isn't passable.

3. Listen to the radio as you travel and heed latest weather information.

4. Seek shelter immediately if the storm seems severe.

5. Try not to travel alone during a storm. Two or three people are better than one because they can help each other. Travel with another car if possible.

6. Make sure someone knows where you are going, when you leave, the time you expect to arrive and your expected route.

7. Always fill your gas tank before entering open country, even for short distances. You will be less likely to be stranded from running out of gas. In case you are stranded by the storm, you will have enough fuel to run the motor and heat the car.

8. Drive defensively.

9. Carry a winter storm car kit. This should include:
additional batteries, Windshield scraper, Booster cables, tow chains,
Fire extinguisher, Catalytic heater, Axe, Plastic scraper, Transistor

radio with extra battery, Tools like pliers, screwdriver, adjustable wrench,
Flares,

Winterizing Mobile Homes

1. Inspect the roof for leaks and cracks. Water can seep through to damage ceilings, interior panels or furnishings. When making inspections or repairs, do not walk on the roof unless it is absolutely necessary. Most repair work can be done from an extension ladder. Be careful not to lean to the side of the ladder when making repairs. Instead, move the ladder to the work area.

2. Check locked or lapped roof seams for loose screws, spreading, parting or buckling. Add new screws if necessary, and cover all seams with roof coating or asphalt-base paint.

3. Check stacks and vents for cracks, and make sure they are free of debris.

4. Check the flashing for loose screws and separation from the roof. Water can freeze between loose flashing and the roof, causing damage when it melts. If necessary, attach flashing to roof area with a liberal coat of caulking and extra sheet metal screws. Then coat screws and flashing area with roof coating or paint.

5. Check to see that molding is secure where roof meets exterior walls.

6. Check total roof surface for cracks, breaks, rust or oxidation. Scrape or wire brush rusted seams and recoat entire roof.

7. Provide at least one front and rear circulation vent and two side circulation vents when installing skirting. Keep vents free from obstructions. Allow for frost and Ground expansion. Do not apply skirting tight against the ground or tight against the bottom of the unit. Without expansion room, frozen ground can heave the skirting against interior panels, causing wall to buckle.

8. Clean or change furnace filters as recommended by manufacturer. Collected dust can be pulled into the motor, causing it to overheat. Some filters can be cleaned with a Vacuum cleaner; some should be washed in a detergent solution; and others require replacement. Follow manufacturer's instructions for cleaning, oiling and replacing parts.

9. During the summer months when the heater is not used, keep the fuel tank full to prevent condensation and rusting. Use only No. 1 fuel oil or kerosene in the outside fuel tank. No. 2 fuel oil can be used in underground tanks. Never add gasoline or naptha to the fuel oil.

10. If the mobile home is not positioned on concrete pads, frozen ground may cause it to heave or rise. This could make the doors stick. To correct this, turn the jack handle on the front hitch, raising the front as needed. Reverse the jack handle when the ground thaws in the spring and the unit settles again.

11. During sub-freezing temperatures give extra protection to water systems, especially if the unit is not set on a permanent sub-surface heated basement. Skirting will help reduce some possibility of freezing damage, but will probably not eliminate the problem. On most modern units, pipes leading from the underground pipe connection to the faucets are protected within the floor system. You will need to protect only the exposed pipes. Use electric heat tape equipped with a thermostat. This material is available at most hardware outlets , and when installing the pipetape, keeping it snug against the pipe. In general, three turns per foot of pipe (a spacing of about 4 inches between spirals) is adequate. Apply friction tape at 12- to 16-inch intervals to hold the heat tape in place. Wrap heat tape over the full length of the water pipe from the floor to below frost level. The heat tape should not touch itself at any point because hot spots could develop, causing failure of the tape. Place insulation around the pipe to save electricity. Inch-thick, pre-foamed pipe

insulation with a waterproof coating is recommended. Tape all joints with a waterproof tape or seal them with adhesive. Be sure the thermostat is also covered with insulation. Plug the heat tape cord into an electrical outlet when cold weather arrives.

12. Freezing problems sometimes occur in mobile home drainage systems, especially when drain pipes below the floor are installed with very little slope. To help prevent damage from freezing: Fix leaky faucets. When water flow in drain pipes is very slow (as from a dripping faucet) the water in the pipeline may freeze. This is especially true if faucets drip overnight. Check toilet tanks. Water running or dripping in the toilet tank could cause sewer lines to freeze. Install electric heating tape on the drain line. Drain pipes are less susceptible to freezing than pipes in a potable water system, so a single strand of heat tape taped to the bottom of the drain line usually will prevent freezing problems. Install insulation over the heat tape. Hold the eave in place with friction tape at 12-inch intervals. Be sure the thermostat is held securely to the pipe and is covered with insulation. Use preformed pipe insulation with a waterproof cover. Tape all joints in the insulation with waterproof tape.

Winterizing Residential Buildings

When winterizing your house, check each of the following items. Repair as necessary.

Roof

1. Check for broken, damaged or loose shingles; small holes; and loose nails.

2. Check flashing around all dormers, vent pipes, chimneys and any other projections where the roof covering meets an adjoining surface.

Gutters and downspouts

1. Clean out leaves, dirt and debris.

2. Paint any rusty gutters.

3. Check supports.

Exterior

1. Repair cracks in stucco or masonry walls.

2. Spot repair and paint any defective areas to prevent damage from freezing and thawing.

Windows and doors

1. Check weather-stripping around windows, doors and between foundation and siding. Replace where needed.

2. Check metal weather-stripping for dents, bends, breaks, loss of tension or other damage that could make it less effective.

3. Repair and paint storm windows if necessary.

Heating system

1. Have a qualified serviceman clean and check your furnace, replacing necessary parts. Furnace check should include:

Fan belts check for proper tension, cracks or wear.

Motors and bearings oil units equipped with oil parts.

Filters clean or install new filters. Fiberglass filters will need to be replaced because they lose their effectiveness if cleaned and re-used. Hot and cold air registers vacuum if necessary. Humidifier (if part of furnace) remove scale, lime deposits and corrosion. Check float valve and evaporator plate.

2. Remove air conditioner for winter storage. Cover with dust-proof cover. If air conditioner is left in the window, install a weather proof cover and seal the space around the unit.

Driveways and sidewalks

1. Clean and repair cracks, fissures and joints in concrete surfaces.

2. Upgrade gravel driveways.

3. Repair cracks or fissures in asphalt drives. Seal with asphalt topcoating.

Preparations to Reduce Heat Loss from Buildings

1. Install overhead and sidewall insulation. Adequate insulation is one of the most important factors in reducing heat loss and will increase the comfort of your home in both summer and winter.

Under most conditions you need the equivalent of 6 inches of fiberglass thermal insulation over your top floor ceiling; 3« or 4 inches of sidewall insulation is also recommended.

2. Weatherstrip and caulk around all joints and frames of windows and doors.

3. Install storm windows and doors or insulating glass. Storm windows can result in a 10 to 20 percent reduction in heating costs. If buying storm windows is not practical (as when renting), tape clear plastic to the window frame.

4. Clean and change furnace filters regularly. Have furnaces checked and cleaned by a qualified repairman once a year. Clean and replace air filters when they become loaded with dust or lint.

5. Close window draperies at night. Regular draperies reduce heat loss slightly; insulated draperies cut down heat loss even more.

6. Seal as tightly as possible any openings which may permit cold air leakage from the attic. Leakage is likely to occur around attic stairway doors, pulldown stairways, electric light fixtures, ceiling fans, air ducts and plumbing vents or pipes. Air leakage from the attic not only increases heat loss but also increases the possibility of moisture condensation in the attic. Condensation can wet insulation and building materials, eventually causing structural damage and reducing the effectiveness of the insulation.

7. If your basement is heated, close off upper wall construction that is open to the attic. However, be sure to provide exterior vents into the wall cavity.

8. Repair leaking hot water faucets. Leaky faucets waste both heat and water.

9. Close fireplace dampers when they are not in use. This will keep heated air from the chimney.

What To Do During a Home Power Failure

During severe winter storms, your home heating system could be inoperative for as long as several days. To minimize discomfort and possible health problems during this time, take the following steps:

1. Conserve body heat.

2. Put on extra clothing. If cold is severe, your bed may be the warmest place. Extra blankets and coverings will trap body heat. This is a good way to keep children warm. Farm families might consider taking refuge in the relative warmth of the livestock barn.

3. Find or improvise an alterric heater, Gas-fired hot water heater, or other heater

4. Provide fuel. Common fuel materials include:

Furnace coal
Canned heat Furnace oil
Wood chips
Campstove fuel
Alcohol
Newspapers, magazines
Charcoal lighter fluid
Kerosene, gasoline
Straw
Firewood
Corncobs

You can burn coal in a fireplace or stove if you make a grate to hold it, allowing air to circulate underneath. "Hardware cloth" screening placed on a standard wood grate will keep coal from falling through. Tightly rolled

newspapers or magazines can be used for paper "logs." Before burning the "logs," stack them properly to allow for air circulation. Consider burning wood, including lumber or furniture, if the situation becomes critical.

CAUTION: Do not store fuels in the heated area because of fire danger, especially if you have highly combustible materials such as gasoline or kerosene.

5. Select a room to be heated. To increase efficiency of available heat, close off all rooms except the one to be heated. When selecting a room or area to be heated, consider the following:

If using a vented stove or space heater, select a room with a stove or chimney flue. Confine emergency heat to a small area. Try to select a room on the "warm" side of the house, away from prevailing winds. Avoid rooms with large windows or uninsulated walls. Interior bathrooms probably have the lowest air leakage and heat loss. Your basement may be a warm place in cold weather because the earth acts as insulation and minimizes heat loss. Isolate the room from the rest of the house by keeping doors closed, hanging bedding or heavy drapes over entry ways, or by erecting temporary partitions of cardboard or plywood. Hang drapes, bedding or shower curtains over doors and windows, especially at night.

6. Provide adequate safety measures. Safety is of prime importance in a heating emergency. Your chances of freezing to death in your home are small. Fire, asphyxiation from lack of oxygen, or carbon monoxide poisoning are much greater dangers unless you take adequate safety precautions. Do not burn anything larger than candles inside your home without providing adequate ventilation to the outside. Any type of heater (except electric) should be vented. Connect the stove pipe to a chimney flue if at all possible. (Many

older homes have capped pipe thimbles in rooms once heated by stoves.) Or hook up your stove to the flue entrance of the nonfunctioning furnace pipe (after removing the pipe). Sometimes a stovepipe can be extended through a window if no other alternative exists. Replace the window glass with a metal sheet, and run the temporary stovepipe through the metal. Do not run emergency stovepiping close to flammable materials. Be particularly careful with window-mounted flues. The wood sash, curtains and shades are especially flammable. If you use a catalytic or unvented heater, provide plenty of ventilation in the room.

Whenever the device is in use, cross ventilate by opening a window an inch on each side of the room. It is better to let in some cold air than to run the risk of carbon monoxide poisoning. Do not burn outdoor barbecue materials such as charcoal briquets inside even in ventillated areas as your resources are used. One person should stay awake to watch for fire and to make sure ventilation is adequate.

If the firewatch feels drowsy, it may be a sign of inadequate ventilation. Keep fire fighting materials on hand.

Responses to Other Heat Loss Problems

During a power failure, keeping warm will be a major problem. However, several other related heat loss problems also should be considered.

1. If it seems likely that the heat will be off for several hours in below freezing temperatures, protect exposed plumbing. Drain all pipes (including hot water heating pipes) in any rooms where temperature falls below 40øF. You may need to drain only portions of your system. Drain the sink, tub and shower traps, toilet tanks and bowls, hot water heater, dish and clothes washers, water pumps and furnace boiler.

2. If your water pump is electrically powered, a power outage could restrict your water use. Save as much water as possible when you drain the system. Store

the water in closed or covered containers, preferably where it will not freeze. You may use water from your hot water heater and toilet tanks (not the bowls) for drinking and household use. Water from the heating system will be unfit for drinking or other household use.

3. Keep on hand a good supply of candles, matches and at least one kerosene or gas lantern with ample fuel. Also have a dependable flashlight with spare bulbs and batteries.

4. If your water supply is shut off, sanitation will become a problem. Flush the toilet only often enough to prevent clogging. (Disconnect the chain or lever attached to the toilet handle to prevent children from flushing.) Provide covered containers for disposing of toilet paper. A portable camper's toilet might be useful.

5. Camp stoves or fireplaces may be used for cook stoves in an emergency. Meal-in-a-can foods such as stews, soups, canned meats, beans or spaghetti require little heat for cooking, and some can be eaten without cooking. Cereals, breads, dried meats and cheese are other "no cook" possibilities. Freeze-dried meals used by campers and backpackers can be prepared with a minimum of heat.

Protecting Your Hot Water System During A Winter Storm Power Failure

1. If you think the heat will be off several hours or more during below freezing temperatures, you will need to keep exposed heating pipes from freezing. This can be done by circulating water through the pipes or adding antifreeze to the system.

2. If electrical power is available, keep the circulator pump going. Moving water does not freeze readily. However, if the room temperature drops to below 40øF, you probably should begin to drain the pipes.

3. Most hot water heating systems are not easily drained. Pipes may have to

be disconnected to drain low points. Open the vents on radiators to release air so pipes can drain.

4. Consult a heating contractor about adding antifreeze to your system. Antifreeze is poisonous and must not be allowed to get into the drinking water system. Make sure the house water system and the boiler water system are not connected. Use only antifreeze containing ethylene glycol. Do not use antifreeze containing methanol. (Methanol vaporizes readily when heated, and could cause excessive pressure in the system.) Make sure the antifreeze does not contain leak-stopping additives. These may foul pumps, valves, air vents and other parts.

Protecting Your Plumbing System During A Winter Storm Power Failure

1. Shut off the water at the main valve, or turn off the well pump if it is in the house.

2. Drain the pressure tank.

3. Open all faucets until they drain completely! Some valves will open only when there is water pressure. If so, remove the valve from the faucet.

4. Drain the entire system by disconnecting pipe unions or joints as close to the main valve as possible. You may use compressed air to blow water from pipes.

5. Insulate undrainable pipes around their main valves. Use newspaper, blankets or housing insulation.

6. Drain toilet flush tanks and spray hoses controls. Lay the softener tank on its side to drain as much water as possible. Also drain controls and tubing on brine (salt) tank. A brine tank itself will not be harmed by freezing.

Protecting Your Sewage System During A Winter Storm Power Failure

1. Empty all drain traps by carefully removing drain plugs or by

disconnecting traps.

2. Blow out inaccessible traps with compressed air or add ethylene-glycol base antifreeze in an amount equal to the water in the trap (1 pint to 1 quart is sufficient, depending on the size of the trap).

3. Check kitchen sinks, bathroom sinks, bathtub drains, toilets, washtubs, showers, floor drains and sump pumps.

Protecting Appliances During A Winter Storm Power Failure

1. Disconnect the electric power or shut off the fuel to all water-using units.

2. Shut off the water supply and disconnect the hoses if possible.

3. Drain all water-using appliances.

4. Check the water heater, humidifiers, ice-making unit of the refrigerator, washing machine and the dishwasher. Do not put antifreeze in these appliances. Close valves to the furnace, water heater and dryer.

Preventing Ice Dams on Eaves

Ice dams along eaves may cause considerable damage to the roof and inside walls of a house. Poorly insulated roofs are the chief cause of ice build-up on eaves. Ice forms when the snow melts off a warm roof, runs down to the eave line, and refreezes there. Ice in the eave trough prevents water from running off freely. If water backs up high enough, it may seep under shingles and down into the house. Sometimes it leaks through plaster walls and ceiling. Ice dams are usually a problem only on cold days when the roof is warmer than the eave overhang. On warm days the snow melts at the same rate on the eaves and water runs off freely.

To prevent ice dams:

1. Insulate between the top floor ceiling and the attic, or along the

underside of the eaves if the attic is used as living space. Insulation also will help cut fuel cost.

2. Ventilate the attic through windows and louvers when insulation is added to the attic floor. This will help reduce moisture condensation in the attic.

3. Use electric heating cables along the eaves if insulation or ventilation is not possible. Cables can be strung out along the edge of eaves. When plugged in, they will heat the area, melt any ice already formed and prevent further freezing when water drips off the roof. Be sure cables are approved for the intended use by the Underwriters Laboratory. Check with your electrician for correct installation.

4. Do not use salt to melt snow or ice from roof. Salt will rust nails, damage gutters and downspouts, and ruin next year's lawn.

Responses to Take When Caught Outdoors During A Winter Storm

Hunters, sportsmen or snowmobile riders occasionally become lost or injured in severe winter weather. Be sure someone knows where you are going and when you plan to return. Don't travel alone. Dress properly. If you do become stranded:

1. Remain calm. Don't rush to get out immediately. You can easily become disoriented and lose your way during a snowstorm.

2. Build a shelter for the night, preferably on the leeward side of brush or timber. In timber country a lean-to gives good protection. Construct one by using two "Y" poles for corners and a sturdy cross shaft. Place poles from cross shaft to the ground and cover with evergreen boughs. In open country where snow is shallow and the temperature isn't too cold, a snow trench can provide adequate shelter. "Snow caves" (in snow at least 4 feet deep) provide the warmest shelter during cold weather. Dig your cave on the leeward side of a drift. Be sure that you don't locate the opening under an overhanging drift or in a possible avalanche path. Cover the bottom of your shelter with boughs,

grass or sticks if they are available. Soft, springy boughs are good for a mattress.

3. Gather a fuel supply that will last throughout the night. Gather fuel while it is still daylight. Build a fire approximately 2 feet from the shelter, using a log or piled rocks to reflect the heat. When daylight comes again, be prepared to increase the size of the fire. Try to produce as much smoke as possible to signal rescue parties. Extreme cold and over exertion can cause a heart attack in cold weather conditions.

4. Stay in your car where you are sheltered and more likely to be found. You can become quickly disoriented when trying to walk around in blowing snow.

5. Stay calm.

6. Keep fresh air in your car. Freezing wet and wind-driven snow can seal the passenger compartment and suffocate you. Keep the downwind window open about an inch when you run the motor and heater. Be sure snow has not blocked the exhaust pipe.

7. Exercise from time to time by clapping hands and moving arms and legs vigorously. Don't stay in one position long.

8. Keep the dome light on at night to make the car visible to snow plows or rescue crews.

9. Have one person keep watch. Don't allow everyone in the car to sleep at once.

10. In a snowstorm, automobile parts can sometimes be used for emergency tools:
A hubcap or sun visor can be used as a shovel. Seat covers can serve as blankets. Floor mats will help shut out wind and cold. Place them against windows on the upwind side to help reduce drafts. Engine oil burned in a hub cap creates a smoke signal visible for miles. To light the oil, prime with a

little gasoline or use paper for starter fuel. Signal with the horn. An automobile horn can be heard as far as a mile downwind.

Special Considerations for Agricultural Producers, Preparing for a Winter Storm

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

1. Be aware of winter storm terminology. Stockman advisories are issued with combinations of cold, wet and windy weather, specifically, cold rain and/or snow with temperatures of 45øF or colder and winds of 25 miles per hour or higher. If the temperatures are in the mid-30s or lower the wind speed criteria are lowered to 15 miles per hour.

2. Stockmen also should consider the effect of the wind chill factor on livestock.

Providing Windbreaks for Livestock Protection

1. Simple shelters, sheds or windbreaks are necessary to protect livestock from winter storms. Usually, severe cold alone will not affect the performance of animals on full feed. Wind, however, can be a serious stress factor. A strong wind has about the same effect on animals as exposure to a sudden drop in temperature. In general, a 20 mph wind is approximately equivalent to a 30øF drop in temperature. Under extreme conditions, simple wind and snow protection devices will not be 100 percent effective.

2. Consider wind and snow as a joint problem when deciding the kinds of livestock protection you need.

3. Simple windbreaks, shelters or sheds are essential for livestock protection from wind and snow.

4. The effectiveness of a windbreak depends on its height and density. Windbreaks may be natural (trees) or manmade (fences).

5. Cottonwood or poplar trees are relatively ineffective as windbreaks because of their low branch density. Supplement these trees with thick-growing trees such as red pines, or with fences.

6. Snow fences can be good substitutes for tree windbreaks which take time to grow and are not practical under all conditions.

7. Porous fences of 80 percent density offer the best wind protection.

8. Snow will drift through a porous fence. A solid fence keeps most of the snow outside a yard and provides the best snow barrier, but may direct snow to other parts of the farmstead. Porous fences can give good snow control if you locate the fences to allow for the resulting drifts.

9. Swirling and relocation of snow within a farmstead is often the main cause of drifting problems.

10. Shallow open-front sheds provide excellent shelters for livestock. Such shelters should have slot openings along the eaves on the back side of the shelter. These openings will provide ventilation and prevent snow from swirling into the front of the shed. Plan slot size according to building width. You should have a 1- to 2-inch opening per 10 feet of building width. Ridge ventilators also are recommended.

11. Do not attach windbreak fences directly to the front corner of an open-front shed. Instead, use a swirl chamber arrangement. Attach a separate short fence to the building. Start the longer fence behind it and away from the building.

12. Divide long open-front sheds into 20- to 40-foot sections to reduce drafts and possible snow build-ups.

13. Locate shelters so that adjacent buildings will not deflect wind and snow into a shed.

Creating Windbreaks On Your Property

1. On some farms a windbreak may be necessary for protection from strong winds and blowing snow. A windbreak will: Protect livestock and reduce winter

feed requirements. Help protect homes and reduce fuel use. Help eliminate snow drifting around farmstead buildings and work areas.

2. Plan the windbreak before you plant. In designing the windbreak you should consider size and location, tree species, tree spacing and soil preparation.

3. To give the best protection from wind and snow a windbreak should be:
Located to the northwest of the farmstead L-, U- or E-shaped, with the ends extending about 50 feet beyond each corner of the area to be protected
At least 50 feet and preferably 100 feet from farm buildings and feedlots on level land (If your land slopes steeply to the north or west, plant trees closer to the farmstead, but no closer than 60 feet from the many trees, especially evergreens, are susceptible to "nitrogen burning." If any section of the windbreak is likely to be saturated by barnyard seepage, plan to construct a ditch or use drainage tile to carry the seepage away from trees.

5. Do not plant windbreaks where they could cause visibility hazards at intersections.

6. If it is necessary to cross fields, driveways or large ditches with a windbreak planting, try to make the crossing at oblique angles. This will prevent direct wind tunnels through the planting.

7. Windbreaks should contain several tree species. A mixture of species offers
Protection against disease, insects and weather damage, and takes advantage of differences in growth rates. Both deciduous and evergreen species should be included, but all trees must have adequate space. Select low, dense growing shrubs for outside rows. Plant medium sized trees next, and tall growing trees in center rows. Your choice of species will depend on your needs, climate and type of soil. Contact your county Extension agent for information about appropriate windbreak species for your area.

8. Sod, loosely powdered soil or field soil is best for tree planting. In late summer or early fall, plow heavy soil and soil covered with sod. If the soil has been deeply plowed and is relatively loose, roll or cultipack it. During winter months cover light or sandy soils with organic material such as well-rotted manure. This will increase soil fertility and reduce the possibility of erosion and moisture losses during winter and early spring. In dry regions summer fallow the land during the year prior to planting. Cultivate frequently enough to prevent any weed or plant growth and to keep the soil in suitable condition for absorbing moisture. If the soil is sandy and subject to blowing, plant a cultivated row crop such as corn instead of summer fallowing. Thoroughly disc and harrow the soil just before planting.

9. Do not overcrowd trees. Trees must have adequate space, especially when deciduous and evergreen species are mixed. Allow at least 20 feet between deciduous and evergreen species. A five-row planting is recommended for the most efficient windbreak but if space is limited use fewer rows rather than overcrowd trees. Properly spaced trees will have increased growth and vigor. Stagger trees in adjacent rows to offset wide spaces between young trees. Be sure to allow enough space for operating any necessary maintenance equipment.

10. Plant trees as soon as possible after receiving them. If you must hold trees for a few days before planting them, unpack them and heel them in until they are to be planted. Keep roots moist at all times during planting. Plant in rows according to predetermined plan. For specific planting instructions, contact a local nursery or your county agricultural Extension agent.

11. Provide protection and care for young seedlings. Protect trees permanently from poultry and livestock. Protect trees from rodents. Use screen wire, tree wrap materials or commercial repellents. Inspect trees periodically for disease or insect damage. To eliminate competition from grass or weeds, cultivate often cold weather causes additional stress on livestock, increasing

their need for food, water and shelter. To minimize livestock loss during winter storms, stockmen should:

1. Move stock, especially the young, into sheltered areas. Windbreaks, properly oriented and laid out, or timber-covered lowlands are better protection for range cattle than most shed-type shelters which may overcrowd and overheat cattle, causing subsequent respiratory disorders. Never close indoor shelters tightly because stock can suffocate from lack of oxygen. Extremities that become wet or are normally wet are particularly subject to frostbite and freezing during sub-zero weather. The loss of ears or tails may be of little economic significance, but damage to male reproductive organs can impair the animals' fertility or ability to breed.

2. During severe or prolonged cold weather, animals need extra feed to provide body heat and to maintain production weight gains. A grain ration that maintains an animal during the summer may not carry it through the stress of prolonged or severe cold. Haul extra grain to feeding areas before the storm arrives. If the storm lasts for more than over 48 hours, emergency feeding methods may be required. Pelleted cake or cake concentrates make good emergency feed. Mechanized feeders may be inoperable during power failures unless you have a source of emergency power.

3. Use heaters in water tanks to provide livestock with enough water. Cattle cannot lick enough snow to satisfy their water requirements.

Caring for Livestock After a Blizzard

1. Following a blizzard, water will be a crucial need for livestock. Cattle will not be able to satisfy all of their water requirements by eating snow. In pastures with severe drifting, water in shallow streams may be absorbed by snow in the stream bed. Very little, if any, running water may be available for several days. You may need to haul water to cattle. If water is limited, keep

cattle off salt. Cattle which have been away from feed and water for several days may overeat salt, causing salt poisoning.

2.When stock cannot be reached by roads, use planes, helicopters or snowmobiles to provide emergency rations. Feedlot cattle that have gone through a severe storm or stress period should be put back on feed carefully. Change the ration gradually from a low to a high proportion of concentrate. Watch your herd carefully for several weeks following prolonged exposure. Isolate cattle showing signs of scouring or labored breathing. Keep these animals in a dry, draft-free place and contact a veterinarian. Cattle which have not been fed for several days or are unaccustomed to grain should be limited to Two to fourpounds per head of whole grain in one feeding, or a total of five pounds per head the first day. Increase the amount of feed by two lb/head/day for large cows. Make any additional increases slowly. Add hay, even poor quality roughage, to the ration as soon as possible. Feeding three pounds per head of hay daily will greatly reduce the possibility of founder (acute indigestion).
Cattle can use hay to better advantage than grains when they must be fed on the ground.

Even moisture-saturated hay can be used until suitable feed is available. Do not use mildewed hay. Depression, followed by colic and diarrheacan occur.
Animals may die in a few days. Some survivors may develop acute lameness.
Prompt treatment can reduce deaths, crippling and recurring digestive disturbances.

Feeding Sheep After a Blizzard

1. If sheep, especially pregnant ewes, are withheld from feed heavy losses may occur.

2. Ewes in good flesh late in pregnancy may incur pregnancy disease if they are without feed for even a short time. Early symptoms of pregnancy disease include

listlessness and depression. As intoxication advances, ewes develop a wobbly gait, become uncoordinated and die.

3. Sheep can eat 1 to 3 pounds of whole grain per day. A small amount of roughage will prevent digestive trouble. Drying feed before giving it to sheep can reduce the possibility of digestive problems.

Feeding Horses After a Blizzard

1. Horses fed a maintenance ration adequate for summer conditions may need additional energy in their winter feed.

2. They can tolerate reduced rations for a few weeks unless they are mares nursing foals.

Feeding Swine After a Blizzard

1. Swine present few problems during periods of feed shortage. If you are substituting other feed, such as dairy feed, for regular swine feed, be sure swine have adequate fresh water available at all times. The salt content of cattle feed will produce salt poisoning in swine unless they have constant access to water.

Protecting Poultry and Livestock During a Winter Storm Power Failure

1. Ventilate shelter. Do not close buildings tight to conserve heat because animals could suffocate from lack of oxygen. Because oxygen eventually will be used up in mechanically ventilated production facilities, clear ice and snow from all vents. Then open vents to facilitate natural air flow.

2. Poultry facilities should be equipped with knock-out panels for emergency ventilation.

3. In dairy facilities, open door or turn cows outside.

4. Provide water. All animals, especially cattle, need plenty of water during cold weather. It may be possible to drive your water pump with a small gasoline engine and a belt. Otherwise, you will need to haul water. If you

have an outside source of water, cattle can be turned out to it. Be sure to place sand or other gritty material on icy feedlots to provide good footing.

Whatever the source of water, watch that it remains unfrozen so animals can drink it. If no water is available, dairymen can feed cows their own milk as a last resort.

5. Provide heat. Use camp stoves and heaters as emergency heat sources for brooders. Plan ahead to have this equipment ready when needed.

6. Provide feed. Animals need extra energy for body heat during severe or prolonged cold weather, especially if they are outside without shelter.

Mechanical feeders will be inoperable during a power failure. Provide for emergency feeding procedures. Pelleted cake or cake concentrate may be used for emergency feed.

Protecting Equipment During A Winter Storm Power Failure

1. Unplug or turn off all electric equipment to prevent damage when power is restored.

2. If you use portable space heaters for supplemental heat, close off the fuel valve as soon as possible after power is interrupted. On models not equipped with safety shut-offs, and especially on some models with gravity feed fuel systems, fuel continues to flow even when the burner is inoperative. An explosion or fire can result when power is restored.

Storing Milk and Cream During A Winter Storm Power Failure

1. You can use the intake manifold on the tractor engine as a source of vacuum to operate milkers that do not have a magnetic pulsator.

2. Ask the dairy to pick up milk as soon as possible.

3. Consider adding a standby power generator to handle vital electric equipment on the dairy.

4. Even if you are short of extra milk storage facilities, do not store milk in stock tanks or other containers such as bathtubs. Dairy plants may not accept milk that has been stored in anything other than regular milk storage

containers. Check with your local dairy about policy regarding emergency storage of milk and cream.

5. Check your tank for souring each time you add milk to it if you are unable to cool your milk or have it picked up. This check could mean the difference between losing all or only part of your milk supply.

Repairing Ice and Snow Damage to Shrubs and Trees

1. To prevent ice damage to trees or shrubs, try to remove ice before winds cause major damage. Do not try to break ice off branches. Connect a garden hose to the hot water faucet to melt the ice. If branches have been badly damaged, remove or repair them as suggested below.

2. Heavy accumulations of wet snow can cause damage to trees and shrubs. Evergreens and weak-wooded trees are more susceptible to snow damage than deciduous and hard-wood trees. Snow damage is more common to shrubs than to trees because snow depth often equals or exceeds shrub height. Evergreen shrubs are more easily damaged ove heavy snow ccumulations: Tap the branches lightly with a broom soon after the snow falls or as it builds up. If snow has melted and refrozen, do not use this procedure because you could break the branches. To remove frozen snow, spray the shrubs with a hose connected to the hot water faucet. Shrubs also may be damaged when snow from walks or drives is piled onto them, or when salt is used for snow removal along drives, walks and streets. With a hose, wash off shrubs that have been splashed with salt from streets. Often snow damage to evergreens is not apparent until the following spring as a broken branch will retain its green color until warm weather.

3. Determine whether the tree can be repaired, or if it should be removed completely. If the main trunk is completely broken or if the tree is uprooted, it should be removed. Most broken branches can be either repaired or pruned. Some branches broken at a crotch can be lifted into place and then bolted and

cabled. Remove broken branch to the nearest branch or to the tree trunk. Never leave a ragged stub. Remove large branches with three cuts. This will prevent splintering and peeling. Make the first cut upward from the bottom of the branch about 12 inches from the next branch. Cut about halfway through the branch, or until the saw begins to pitch. Make the second cut 5 or 6 inches further out, and continue cutting until the branch falls. With a third cut remove the stub cleanly without peeling. Treat wound.

Family Disaster Plan and Personal Survival Guide

There are many different kinds of disasters. Earthquakes, floods, fires, airplane crashes, chemical spills, pipeline leaks and explosions, and others, small and large, which seldom give warning are equally devastating to their victims. This guide is primarily geared to earthquakes, but the planning you and your family do now will be of benefit when and if any disaster strikes you.

Family Meetings: At least once a year have a meeting with your family to discuss and update your plan and determine what training, equipment and supplies are needed. Occasional drills will assure quick reaction and avoid injury and panic in an emergency. Share your plans with neighbours, friends, relatives, and co-workers.

Preparedness Activities

Learn how to protect yourself from falling objects, smoke, fire, caustic fumes, etc.

Learn First Aid (available through your local Red Cross Chapter)
Persons Trained: _____ Date: _____
Location of First Aid kit: _____
Learn how and where to shut off utilities.
Location of gas valve: _____
Location of wrench: _____
Location of main water valve: _____
Location of main circuit breaker: _____
Location of other utilities:
_____>
Draw a Plan of your home, on a piece of paper draw a floor plan of your home showing the location of exit windows and doors, utility cutoffs, First Aid Kit, emergency supplies, food, clothing, tools, etc. Be sure everyone in you

household is familiar with it. Show it to baby-sitters and house guests when
you're going to be away. They could use it to direct someone to a utility
cutoff in an emergency. List alternate places to meet around home Outside:

_____

Inside: _____

Alternate reunion locations when family is not at home, e.g. Red Cross shelter,
neighbour, relative, park, school.

_____

Learn and discuss school disaster policy. Church? Club? Other? Are medical
consent
forms complete?

_____

Identify where emergency supplies and equipment are located.

Fire extinguisher: _____

Flashlight/Batteries: _____

Portable radio: _____

Tools: _____

Safety equipment: _____

Water: _____

Sanitation supplies: _____

Food: _____

Cooking equipment: _____

Blankets: _____

Extra eyeglasses: _____

Medication: _____

First Aid Supplies: _____

Complete set of clothes, shoes, gloves:

_____

After an Earthquake

Be prepared for after shocks, Put on Heavy shoes immediately to avoid injury
from
stepping on glass and other debris. Check for injuries and give first aid.

Check for fires and fire hazards.Remove fallen objects from top of stove.

Sniff for gas leaks, starting at the hot water heater. If you smell gas or
suspect
a leak, turn off main gas valve, open windows and carefully leave house.

Do not turn lights on or off or light matches or do anything that makes a
spark.

Note: Do not shut off gas unless an emergency exists. Do Not turn it back on

until the gas company or plumber has checked it out. If damage to electrical system is suspected, (frayed wires, sparks or the smell of hot insulation) turn off system at main circuit breaker or fuse box. If water leaks are suspected, shut off water at main valve. Check neighbours for injury. Turn on radio and listen for advisories. Locate light source if necessary.

Do not touch downed power lines or objects touched by downed wires. Clean up potentially harmful materials. Do not use phone except for genuine emergencies.

Check house, roof and chimney for damage. Check emergency supplies. Check to see that sewage lines are intact before continued flushing of toilets. Do not go sightseeing. Open closets and cupboards carefully. Cooperate with public safety officials. Be prepared to evacuate when necessary.

If you Must Evacuate Prominently post a message indicating where you can be found. Take with you the First Aid Kit, Flashlight, radio and batteries

Important papers and cash, Food, Sleeping bags/blankets, Clothes, Toiletries and personal item, Baby supplies, Special Health Needs, Keep a list posted of supplies/equipment that your particular family members may need to take with them in case of evacuation. Include such items as: Medication, insulin & syringes, Dentures, Eyeglasses, contact lens supplies, Wheelchairs, walker, crutches, Oxygen tanks, Special dietary needs, special baby formula. Name and number of family doctor and dentist.

Pets In a Disaster

Pets are not permitted in shelters, so families should plan for their pets in the event of a disaster such as an earthquake., if you must leave your home, you should very seriously consider provisions for leaving your pets behind. They should be confined to a basement, garage or bathroom. Leave only friendly dogs together. Never leave cats with dogs, even friendly dogs. Do not leave pets in a car with windows closed. The most important task is to provide water. Dogs and cats adapt well to deprivations of food, but not water. Fill a tub or several buckets. Tie any vessel so that it cannot be tipped over. It

may be better to leave no food than to leave food which will spoil. It is probably best to leave only dry pet food, low in protein and fat.