STORING FOOD AT HOME

AN AID TO EXTENSION AND VILLAGE WORKERS IN MANY COUNTRIES

Federal Extension Service, United States Department of Agriculture, in cooperation with the Agency for International Development, U. S. Department of State
This is for
YOU

The Home Economics Extension Worker

or

Village Worker

The information in this booklet is based on experience of extension workers like yourself and health workers in many countries. You'll find ideas to help you teach families how to store food at home.

Use this material in any way best suited to your needs.

BY KATHRYNE SHEEHAN HUGHES

Appreciation is expressed for assistance from: health, sanitation, home economics and information personnel of the Agency for International Development; specialists in the Federal Extension Service, and staff members of other agencies.

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Cover Picture.--A woman in India made this food storage cabinet.

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You work hard when you grow food and prepare it to eat. If you buy food it takes money. You do not want to waste it. To keep food clean and safe in the home you must have good storage space, suitable containers and a way to keep foods cool and dry.

HOW TO CARE FOR VARIOUS KINDS OF FOOD

Different kinds of food need special care. Treating each food properly will make it keep longer.

Dairy Foods

Fresh milk is safe if it is boiled. If you do not have refrigeration, boiled milk will keep longer than milk that has been pasteurized. Cream will keep longer if it is boiled.

After milk and cream are boiled, then cooled, store them in clean containers in a cool place. In warm climates these foods will keep longer if stored in an iceless or mechanical refrigerator.

If canned, evaporated, condensed or dried milk is used, add water and boil for 10 minutes. Unsafe milk should not be added to hot or cold beverages.

Cooked foods using milk or cream spoil very quickly. Use them immediately in hot climates. Do not store.

Dried milk in its original containers will keep for several months in a cupboard or on open shelves. Close the container properly after using. The milk will take up moisture and become lumpy if exposed to air. Then it is hard to mix with water and food.
Canned evaporated milk and condensed milk may be stored at room temperature until opened. Before opening shake the can to avoid separation of the milk. After opening, cover tightly and store in an iceless or mechanical refrigerator if possible.

After dried milk has had safe water added to it, store it the same as fresh fluid milk.

Butter should be kept in a cool place, in a covered container.

Keep hard cheese in a cool place. Wrap tightly in a clean cloth or paper to keep out air. Put in a box or metal container if possible. Before using, trim away any mold that forms on the surface.

Soft cheeses should be stored in a tightly covered container in a cool place.

**Fresh Meat, Fish, Poultry**

The moist surfaces of dressed meats, poultry and fish attract bacteria that cause spoilage. Keep these foods clean, cold and dry. They should be allowed some air when stored. Wrap loosely with a clean cloth or paper. Wipe or scrape off any dirt before wrapping.

These foods spoil very quickly. They should not be kept long in warm, moist climates.

Rubbing cured or smoked meats with dry baking soda may help prevent molding. If meat is attacked by insects and shows spoilage, cut out the bad part.

**Eggs**

Sort eggs as soon as they are brought from the poultry yard or market. Cracked or spoiled ones should be removed for immediate use. Rough handling, changes in temperature, and fertility affect the keeping quality of eggs.

Keep eggs in a covered container in a cool, dry, clean place.

Wash all eggs in cooled boiled water just before using. Water removes the thin film on the shell which protects the egg. This film helps to stop evaporation, the entrance of harmful bacteria and the absorption of odors.
**Fresh Fruits and Vegetables**

Most fresh fruits and vegetables need to be kept clean and in a cool place with good air circulation. Such conditions help to prevent spoilage.

Sort fruits and vegetables before storing. Use bruised ones immediately, throw away decayed or spoiled ones. Ripe fruits and vegetables should be used in 2 or 3 days. Allow them to ripen in the open air out of the sun. Wash fruits and vegetables before using them.

Fruits and vegetables stored in boxes, baskets, barrels and bins should be sorted frequently to remove decayed or spoiled ones. Some fruits such as oranges and apples may be wrapped in separate papers. The wrappers help to keep the fruit from bruising each other and also help to avoid mold.

If possible, soft fruits such as berries, peaches, and plums should be spread out on clean wrapping paper or in shallow pans or platters rather than deep containers.

**Fats and Oils**

Keep all fats cool, covered and in light-proof containers. Heat, light and air help to make fats rancid.

Mold on the surface of fats shows moisture is present. Remove the mold carefully. If possible, heat the fat to drive off the moisture.

Foods like nuts and chocolate which have some fat may get rancid. Nuts keep best when left in shells. Keep these foods cool and clean, in lightproof containers.

**Baked Goods**

Cool bread, cakes, pies, cookies and other baked goods rapidly after they are taken from the oven. Be sure the place is free from dust and insects. Wrap bread with a clean cloth or paper.

Store baked goods in a clean tin box or other suitable container off the floor.

Molds grow on bread. Scald and air the bread box at least once a week. In hot humid weather do not shut the bread box tightly when it is filled with fresh bread.

Store bread, crackers, and crisp cookies in separate containers to retain crispness.
Dried Foods

Dried meats and dried fruits and vegetables may be kept in closely woven cloth bags. Hang these bags of food in a cool, dry place. If these dried foods are hung in a damp place they are likely to mold.

Open bags of dried foods should be kept in a pottery or metal container. Cover the container tightly to keep out insects and rodents.

Canned Goods

Canned foods should be kept in a clean, dry, cool place. Arrange so air may circulate around the cans. Canned vegetables and fruits may leak. Destroy any swelled or leaking cans. Clean off other cans left on the shelf. Wash the shelves with hot soapy water.

Leftover Cooked Foods

Moist cooked foods, particularly those made with milk, eggs, meat or fish, spoil easily. Leftover cooked foods should be cooled quickly. Store in an iceless or mechanical refrigerator or a cool place. Use at the next meal.

Leftover cooked foods should be brought to a boil or thoroughly heated before being served again.

When is Food Spoiled?

Food generally shows when it is spoiled. Check it often. It may have an unpleasant appearance, taste or smell.

Look for these signs of food spoilage:

- slime on the surface of meats
- bad odors
- sour taste in bland foods

It is important to destroy spoiled foods as soon as they are found. Throw away any food that has a bad smell. Chopped meat, eggs and seafood usually spoil rapidly. Watch grains for signs of weevils. Look for insects and mold in dried foods. Destroy the part which has insects or mold at once.

If any jars or cans of food are leaking or bulging, get rid of the food. It can make you sick.
WHY FOOD SPOILS

Foods may be spoiled by:

- bacteria and molds
- parasites of meat animals
- insects and rodents
- warm air, freezing temperatures and light
- too little or too much moisture

Dirt and careless handling increase food spoilage. Good care of food in the home can help avoid waste. Keep food in a clean and safe place.

**Bacteria** are living things so small you can’t see them.

Many are harmful. They live almost everywhere. Sometimes food is made unsafe because bacteria causing disease have gotten into it. Food can carry these diseases:

- amoebic dysentery and other dysenteries
- typhoid
- botulism
- tuberculosis
- diptheria
- salmonellosis

People may appear healthy and still carry these disease bacteria in their bodies. When they handle food, the bacteria may be passed on to the food. Then the food is unsafe for others.

**Bacteria in foods** may be destroyed by:

- drying
- heating
- exposure to the sun
- removal of air
- chemical substances

Molds can be harmful. They grow where it is damp. Molds look like delicate velvety or powdery growths of various colors spread through food.

If meat or cheese have mold on the surface, cut away the moldy part. The food that is left may be eaten. Throw away moldy canned foods.

**Parasites**, such as tapeworm and trichina, live in meat animals. The tiny larvae of these parasites might be in the lean meat. They are waiting to complete their development in the human body or some other place.

Thorough cooking of meat is the best way to destroy these parasites. Preservatives such as salt and smoke do not destroy them. There is great danger in eating uncooked sausages even though they have been smoked.

**Bacteria** need water to live. Removing water prevents their growth. Foods are dried to preserve them. Then they are kept dry. Some foods that are dried are meat, fish, beans, peas, grapes, figs and currants. They are dried in the sun or smoked over a fire.

Cooking foods destroys many kinds of bacteria.

When foods are canned, air is removed and the container is sealed. This process removes air that many bacteria need to grow.

Many chemical substances either destroy certain harmful bacteria or prevent their growth. For food, two of the simplest to use are salt and sugar. Salt is used for meat and vegetables. Sugar is used to preserve fruits.

**Insects and Rodents** may destroy foods. They may also leave dangerous bacteria on them.

The house fly may spread typhoid fever, cholera, dysentery and tuberculosis.
The "fly specks" often found on food or dishes may have disease germs and the eggs of dangerous parasites in them.

The rat destroys many types of food.

To help keep these pests out of food:

- keep it covered or in closed containers
- get rid of garbage and trash

Poisoned bait, powders, or sprays may be necessary to rid storage areas of household pests.

Ask your health department sanitation or other official to tell you what pesticide to use, where to get it and how to use it. These people have special training on how to control household pests. They want to help you.

Use pesticides with care. They are POISONOUS to people and animals. Keep them out of reach of children. Never store insecticides in the same place you store food. Always wash off any dust, spray, or solution that gets on you. When spraying remove dishes, pots and pans, other cooking utensils, and food from the room. If you have a cupboard with solid, tight fitting doors store the dishes and cooking equipment here while spraying. Never use oil spray or solutions near a fire.

Temperature affects food. Many fresh fruits ripen rapidly when left in a warm room. If they are left at room temperature too long after they are ripe they spoil. Nuts become rancid more quickly if left in a room where the air is warm.

Freezing temperatures can ruin the texture and flavor of some foods. Frozen potatoes are watery and have an unpleasant flavor.

Light makes fresh fruits and vegetables ripen faster. Some canned and dried foods keep their color longer in lightproof containers such as tin cans.

Moisture in the air is necessary where green leafy vegetables are stored. If there is not enough moisture in the air, the moisture from these vegetables will evaporate into the air. Then they become wilted or limp. These vegetables keep best when stored in an iceless or mechanical refrigerator.

Crackers and cookies lose their crispness by absorbing moisture from the air. They should be stored in a dry place where there is no moisture in the air.

THE STORAGE AREA

A good storage area is:

- well ventilated
- cool and dry
- free of rodents and insects
- clean and neat

You may store food in the kitchen in cupboards on open shelves, or in a closet with shelves. Sometimes a separate room next to the kitchen, called a pantry, is used for storing food. Also cellars, caves and outdoor pits are used in some parts of the world for food storage.

Good Ventilation

Ventilation is important for good food storage. Good circulation is needed around food to carry off odors, to keep the right temperature and the right amount of moisture. Food needs to breathe. Good ventilation helps to keep food cool.
Keep the Storage Area Cool and Dry

Many fresh fruits soon spoil in a warm place. Then they are unsafe to eat. Cooking oils, table fats, and other foods with fat in them may get a stronger flavor if stored in a warm place. A dry storage area helps to avoid mold on foods such as bread, cheese and berries. It also prevents rust on tin cans in which food may be canned or stored.

Keep the Storage Area Clean

There is no substitute for cleanliness. Scrub shelves, cupboards and floors often. Paint, whitewash, or line shelves with clean paper. Clean the walls, then paint or whitewash them. Keeping the storage area clean helps to keep away household pests.

Remember, cleaning destroys insecticides. Apply them after you clean not before.
CONTAINERS FOR FOOD

It is very important to have good containers for storing food. Some foods must be stored in containers with tight fitting covers. Generally each food is best stored in a separate container. Label food containers to save time and avoid accidents.

Dry foods should be stored in glass, pottery, wooden, tin or other metal containers. The type of container will depend on the food to be stored and whether the container can be washed. Dry tin quickly to avoid rust.

For moist and watery foods the choice of containers is more limited. Leakage must be avoided. You must consider the effect acids in watery foods have on metals. A container that can be washed and aired before fresh supplies are stored in it is best.

Pottery jars are good for storing many kinds of food. Jars that are glazed on the inside are best. They can be washed easily. If the jars do not have a tight fitting cover, make one. Use a plate, saucer, or piece of metal. A good cover helps to keep out insects and rodents.

Glass jars with tight lids are also good for storing many foods. Foods that are affected by light should not be stored in glass jars unless the jars can be stored in a dark place. Glass jars can be used again. Wash them in hot soapy water. Rinse them with hot water that has been boiled for 10 minutes. Dry them in the sun if possible.

Bottles are good for storing liquids and some dry foods. In many countries people preserve fruit and vegetable juices in bottles.

Coconuts, gourds and calabashes may be used for storing some dry foods for a short time. Covers can be made of closely woven materials. Insects tend to eat away the soft lining of these containers. So they are not good for storing meal and flour for long. Wash these containers often to keep out weevils. Dry in the sun.

A simple cupboard can be made from a wooden box with shelves. The door is made of chicken wire so air can circulate. Use it to store root vegetables and some fruits.

Tin cans of all sizes are good for storing foods. Sometimes the lids of cans containing food have been removed with a hand or mechanical can opener. Then the lid does not fit. If you use these cans to store food, make a cover out of a plate, saucer, or a piece of metal.

Use a food cover to keep out flies and other insects when you store food on a table in an uncovered container. You can make a food cover out of mosquito netting and a metal or wooden frame. Store foods this way for a short time only.

All of these containers may be used to store foods.

This diagram shows how to make a food cover.
A bread box may be made of metal or wood. Punch holes in each end for air circulation.

Open baskets are good for storing fresh fruits and vegetables for short periods. A tight cover is not needed for these foods.

**Care of Food Containers**

Food containers must be kept clean. Wash and dry containers before fresh supplies are stored in them.

Water for washing containers should be clean and hot. Boil it for 10 minutes. Use soap. Rinse the containers carefully with clear clean water. Dry them in the sun if you can.

Do not store food in containers which have held kerosene, gasoline, heavy oil or insecticides.

Containers holding food that does not need to be kept cool may be stored on shelves or on a table.

In Ethiopia covered baskets are hung from the rafters and used to store dried fruits and vegetables and bread.
Some foods are quite perishable. They are:

- fresh meat, fish and poultry
- some fresh fruits and vegetables
- milk, butter, margarine and cream
- leftover cooked foods

In a warm climate it is best to buy these foods in small quantities and use them quickly rather than store them. If you have to store these foods, keep them as cool as possible. This is one way to keep them fresh and prevent spoilage.

WAYS TO KEEP FOOD COOL

THE ICELESS REFRIGERATOR

You can make this kind of food refrigerator at home. Here are directions.

1. Make a wooden frame (maximum size 56x12x14 inches.)

2. Cover with screen wire or heavy cloth such as canvas. If possible, use non-rusting wire. If it is not available, woven grasses, cloth, or branches might be used.

3. A door should be made for one side and mounted on hinges. It can be fastened with a wooden button or latch. The bottom of the door should fit tightly.
4. Make adjustable shelves of light wooden frames covered with poultry wire or woven native grass or other mesh material. Rest these shelves on side braces.

5. Place a 4 inch deep pan on top. You can make one from kerosene cans, or a bucket. Stand the frame in a container of water. This may be a kerosene can.

6. Make a cover to fit the frame. Burlap, canton flannel, or a heavy coarse cloth may be used.

7. Button the cover around the top of the frame and down the side on which the door is not hinged.

   Use large headed tacks or lace with a cord through worked eyelets.

8. On the front side, fasten the cover to the top of the door instead of the frame and down the latch side. The large hem should overlap the door closing.

9. The bottom of the cover should extend down into the lower pan.

10. Sew 4 double strips of cloth 8 to 10 inches wide to the upper part of the cover. These strips form wicks that dip over into the upper pan.

11. Keep the upper pan filled with water. Dampen the cover by dipping it in water or throwing water on it.

12. Paint the woodwork, pans, and shelves to help keep the iceless refrigerator clean. Oil wooden parts with linseed or other oil used on wood if paint is not available. Let dry in the sun a few days before using.

13. Clean and sun the iceless refrigerator once a week. Wash the cover and sun it once a week. You may wish to make 2 covers. A fresh one can be used each week and the soiled one washed and sunned.
This diagram shows how to make a simple iceless cooler.

**AN ICELESS COOLER**

You will need:

A basket with loose fitting cover. May be made of bamboo or other slender wood with open weave. The size depends upon the family's needs.

A container to set the basket in. This may be square or round, of earthenware or metal. A clean oil drum could be used. This container should be about a foot high and wider than the basket.

Bricks or stones.

Burlap of the soft jute type.

**Building the Cooler**

1. Select a cool place in the kitchen away from the stove for your cooler.

2. Place the outer container here.

3. Arrange the bricks or stones in the container so the basket will balance evenly on them.

4. Sew burlap around the rim of the basket. Let it hang loose around the bottom and extend into the earthenware or metal container.

5. Sew burlap loosely over the cover of the basket.

6. Set the basket on the bricks.

7. Place food in the basket and cover.

8. Put water in the bottom of the container. Wet the cover of the basket the first time the basket is used. Later do this just occasionally.

9. The basket should not be in water. The burlap cover should hang down into the water.
A WINDOW BOX

In some countries window boxes are used to store foods during the cool months of the year. They must have good ventilation and tight covers to keep out rain or snow. An ordinary light wooden box may be used or you can make one.

Installing A Window Box

1. Fit the box to the outside of the window. The window is the door. Select the window that is in the shade longest during the day.

2. Put a shelf on the window sill. Support the shelf with wooden braces.

3. Set the box on the shelf.

4. Fasten the box to the window case with screws or nails.

5. Fit a sloping top over the box to shed the rain.

6. Make holes in the end of the box so air can circulate and screen them.

7. Shelves may be made of heavy screening, poultry wire, or wood.

8. Rest the shelves on cleats which are fastened to the sides of the box.

9. Paint the box inside and out. It will be easier to keep clean. Wash the inside with soap and water from time to time.

10. Food placed in the box should be in clean covered containers.

A food storage closet may also be built on the outside of the house. You can make it open into a room by a special door through the wall.

These diagrams show how a window box looks from both inside and outside the house.
OTHER WAYS TO KEEP FOOD COOL

A mechanical refrigerator is ideal for storing perishable foods. However, refrigerators are not available in all parts of the world. Where a refrigerator is used, it needs special care.

Clean and defrost it regularly. To do this, turn it off. Allow the ice to melt. Wash inside the refrigerator thoroughly, using warm water and soap. Pay special attention to the corners.

An ice chest can be made at home. Line a wooden packing case with galvanized iron. Hang food safes are used in the Caribbean area and Africa.

You will need to put insulation between the wooden box and iron to keep out heat. Use sawdust, cork or similar material. Make a hole at the bottom for water to drain out as the ice melts. Keep the ice chest clean. Wash it with soap and water often.

A wooden keg lined with cement makes a good food cooler. You may store leafy vegetables such as spinach and lettuce here. The vegetables can be kept in a string, paper or plastic bag. Hang the bags on a hook screwed into the cover of the keg. Fill the bottom with water.

On some farms cold water pumped from deep wells for livestock may first be used to cool foods, by running it through a suitable storage box. Also a house or box may be built over a spring or brook to keep foods cool.

Special wells or caves are sometimes built for cool storage of foods.

STORING VEGETABLES AND FRUITS FOR WINTER USE

In some countries the climate is too cold to grow foods the year around. Many farmers and gardeners in parts of the
world have found good ways to store some vegetables and fruits.

Some of their methods may be ones you will want to study and tell others about. Your agricultural advisor can help you decide which type of storage is best for your climate and the foods grown in your area.

Fruits and vegetables can be stored in pits, trenches, outdoor cellars or caves to keep them through the winter. Here are some kinds of storage you can build.

**POST-PLANK CELLAR**

This type of storage cellar is low in cost, but does not last long as the wood will decay.

1. Dig a hole big enough to hold the foods to be stored and 4 feet deep.
2. Keep the soil piled nearby and use it to cover the roof and bank the sides.
3. Set two rows of posts of the same height in the bottom of the pit near the side walls.
4. Set a middle row of posts about 5 feet higher than the outside posts. Put a ridge pole on the center row. Lay planks on the two outside rows.
5. Next place a roof of planks.
6. Close the ends and cover the whole cellar except the door with soil. The door may be made of planks or other durable material. The thickness of the cover depends upon the climate.

**CABBAGE PIT**

A good way to store cabbage, collards and other greens is in a pit made of stakes and poles covered with straw.
CONE-SHAPED OUTDOOR PITS

1. Build the pit either on the surface of the ground, or in a hole 6 to 8 inches deep in a well-drained location.

2. Spread a layer of straw, leaves or similar material on the ground.

3. Stack the food to be stored on the litter in a cone-shaped pile.

4. Cover the food with more straw, leaves or similar material.

5. Cover the entire pile with 3 to 4 inches of soil.

6. Firm the soil with the back of a shovel to make it water proof. More soil may be needed in very cold weather.

7. Dig a shallow drainage ditch around the pit to carry away water.

8. Ventilation or air circulation is necessary.

Small pits with a few bushels of vegetables will get enough air if the straw between the vegetables and soil extends through the soil at the top opening. To keep out rain, cover the top with a board or piece of sheet metal held with a stone.

Large pits - Place two or three rough boards or stakes up through the center of the pile of vegetables to form a flue. Cap the flue with two boards nailed together at right angles.

9. Opening the pit - Once the pit is opened it is best to remove all the food at once. It is better to make several small pits rather than one large one, and place small amounts of vegetables in each pit. When several kinds of vegetables are stored in the same pit, separate them with straw or leaves.

10. Pits should be made in a different place every year to avoid decay from spoiled food left in an old pit.
DEMONSTRATIONS

Show how to:

Make food covers of mosquito netting and bamboo or barrel hoops.

Make shelves from wooden boxes.

Make a small vegetable cupboard with chicken wiring on the door from a box.

Make an iceless refrigerator.

Make an outdoor pit and store food in it.

Make a cupboard with solid doors to store dishes and cooking utensils.

Suggestions to Help You Give a Good Demonstration

Prepare yourself carefully. Know more about the subject than you plan to teach.

Outline your demonstration step by step and write down exactly what you will say at each step.

Practice your demonstration until you can do every step without hesitation.

Use only equipment and materials available to village families.

Arrive at your meeting place ahead of the women and arrange all materials for your demonstration neatly and in the order you will use them.

Plan for your audience to be seated so that everyone can see and hear easily.

Use visual aids in your demonstration if they will help to make your presentation clearer.

Ask one of the women to assist you. This helps develop leadership.

Evaluate your own demonstration

(1) Did the women learn how to do what you demonstrated?

(2) What evidence was given that the women plan to carry out this practice in their homes?

(3) How could this demonstration be improved?
REMEMBER....

To make food safe

- Keep it clean
- Store in a cool, dry place

This fourteen-year-old girl in India built this movable clay pantry.

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