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STORING THE FAMILY FOOD SUPPLY

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Introduction

The planning for and providing of an adequate food supply is an important farm practice if permanent economic security and vigorous health are to be enjoyed by rural people.

This task is not complete, however, until adequate storage for the family food supply has been provided. Storage space is necessary for canned foods, dried foods, fresh fruits,, fresh vegetables, meats, eggs, etc.

Some sort of storage facilities exist on every farm or can be easily and cheaply provided since storage is neither difficult nor expensive. To be successful the storage structure should control to some degree temperature and moisture conditions and to do these jobs two factors are employed; namely, insulation and ventilation. This simply means that the storage must be insulated against heat and cold and supplied with adequate ventilation to replace warm foul air with cool fresh air. In the summer time this can be done by closing all openings to the storage during the heat of the day and opening them at night when the air is cool.

In many instances it will be possible to house the entire food supply in one structure, but this is not necessary since in many cases it will be more economical and convenient to store the various groups of foods that require different storage conditions in different places.

STORAGE STRUCTURES

There are several types of storage structures that can be used on the farm and the one selected will depend on local climatic conditions and the materials available for construction. The common types of farm storages are: the underground cellar or cave, the half cellar, the basement under the house, the above ground house, and the kitchen pantry. Any one or a combination of these may be used as a general farm storage, and will give fine results if provided with adequate insulation and ventilation.

Cellars

There are two types of storage cellars. The regular cellar built entirely under ground is one type, and the half cellar which is part under the ground and part above the ground is the other type. Cellars are usually built of concrete, although in the case of the half cellar the part above ground may be of lumber, brick, or stone. It is well to paint the top of the cellar with some sort of waterproof paint. If

the color does not matter, asbestos fiber roof paint is good, and half cellars that are to be covered entirely with dirt may be painted on all sides above the ground.

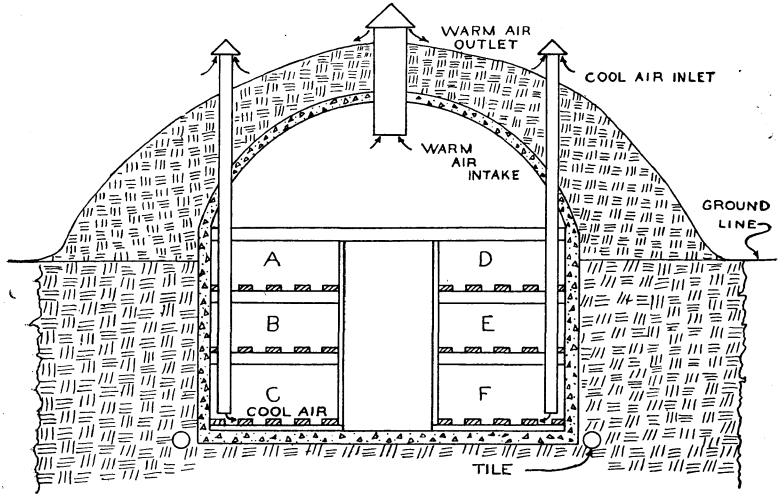

Fig. 1—Cross section of underground cellar showing suggested ventilation arrangement and storage areas.

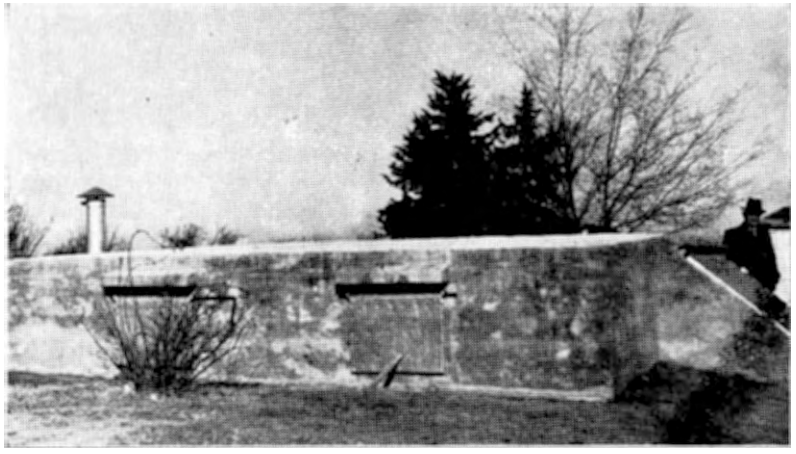

Fig. 2—Half Cellar showing ventilator and windows above ground level.

The underground cellar has the advantage of being cool in the summer and warm in the winter. It has the disadvantage of being dark as there is no place for a window, except at one end below the ground level. Ventilation can be provided by inlet and outlet flues provided with dampers as shown in Figure 1.

In the eastern part of Oklahoma many cellars cannot be used because of dampness coming from hillside seeps, and a shallow water table. In other parts of the state cellars are common and provide excellent storage places. Every cellar, however, should be provided with a tile drain around the foundation to take away excess water that is liable to accumulate during wet periods. The tile may be emptied into a dry well or a lower place down a slope from the cellar. A wet cellar is not a good storage place.

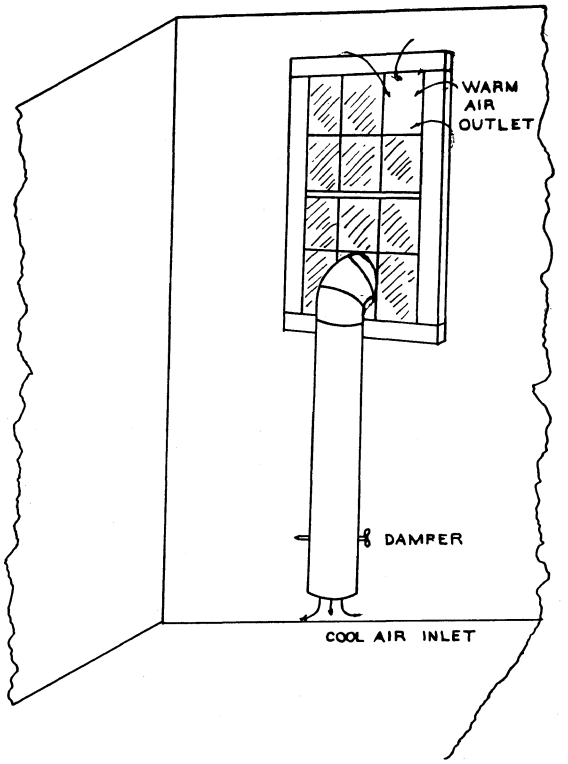

Fig. 3—Ventilation arrangement for basement or half cellar window.

The half cellar storage is much the same type of structure as the regular underground cellar except that it extends above ground. The depth that the half cellar extends into the ground will vary, depending on local conditions. Drain tile should be provided around the foundation for drainage the same as in the regular cellar. The half cellar may have several windows in the part above the ground which overcomes the disadvantage of poor light in the regular cellar. However, the half cellar will get hot in summer and cold in winter unless it is well insulated. This can be done by covering the entire part above ground with a thick layer of soil.

The basement under the house can be classed as a cellar since all the house does is provide a top. Generally, basements have plenty of light provided by windows located below the ground level, but ventilation is poor unless cool air inlets are provided as shown in Figure 3.

This type of ventilating system can be used in basements or in half cellars where windows are located in the part of the structure above the ground level.

Storage Houses

Storage houses may be called cellars built entirely above ground and many people prefer this type storage. They may be built of lumber, brick, stone, concrete, or any material available. The only difficulty in construction is the providing of adequate insulation, because farmers cannot afford to provide artificial heat or cold for their storage houses. Insulation can be provided by building the walls and ceiling in such a way that three to four inches of space between two layers of heavy waterproof tar felt or like material is provided for some insulating material. Insulation may be provided by dry shavings from a planing mill, pine preferred to hardwood, newspapers crumpled up and packed tightly, dry finely chopped oats, straw, or any other like material available. Any of these used dry and packed good and tight into the four inches of space provided in the walls and ceiling of the storage will give sufficient insulation. Many types of commercially prepared insulating materials may be purchased on the market such as rock wool, glass wool, cork, micholite, and various types of fiber board.

Any farmer can build a well insulated home storage house if he will take the time and trouble.

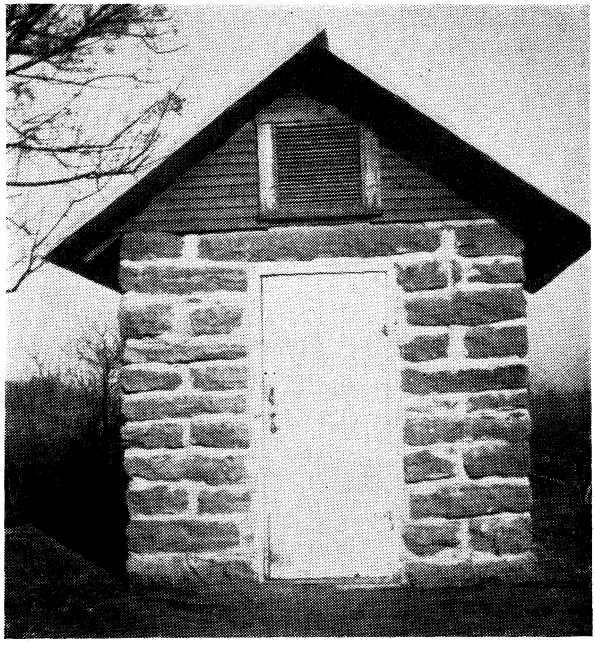

Fig. 4—Above ground storage house.

Ventilated Pantry

The ventilated pantry is the ordinary kitchen pantry provided with a cool air inlet and a warm air outlet to make it a better storage place.

The cool air inlet is usually a hole in the floor which allows passage of cool air from under the house through the pantry. If the house has a solid foundation air inlets should be provided in the foundation. The warm air outlet is usually in the attic and may be provided by a wooden shoot or stove pipe extending from the top of the pantry into the attic. In one story houses a hole in the ceiling of the pantry will serve as an outlet. Both inlet and outlet should be provided with dampers and screened.

Mound Storages

Mound, trench, or pit type storages are temporary or seasonal and are used to keep fresh vegetables and fruit during the cold winter months when the storage requirements are ventilation and isulation against freezing weather. Mounds are merely stacks of produce covered with soil as shown in Figure 6.

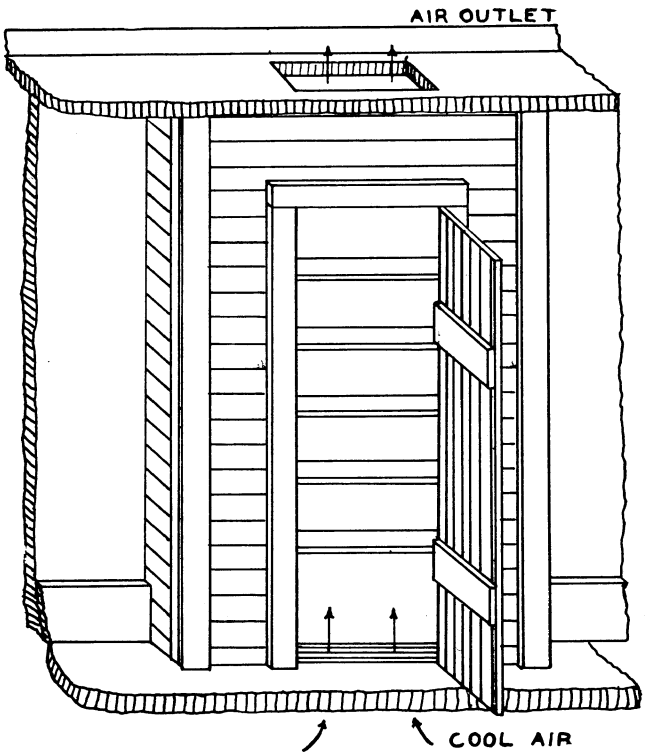

Fig. 5—Ventilated Pantry.

Trenches and pits are holes dug in the ground, provided with drainage to keep them from getting wet, into which products are packed and covered with straw and soil.

In all mound, trench, and pit storages ventilation should be provided as shown in Figure 6. An old stove pipe or water spout full of holes is excellent for this purpose and the bucket over the end prevents rain and snow from getting into the pipe. An old barrel laid on its side and covered or partially buried and covered makes an ideal small mound or pit storage. The cold frame or frame garden, while not in use during the winter, can easily be turned into a mound storage, and boxes buried in the ground make fine storage places for vegetables. All of these storages should be located where water drains away readily and provided with some sort of doorway so that the products can be secured easily when needed.

Miscellaneous

For products that require warm dry storage places the barn loft or attic in the house may be used. If the heating plant for the home is housed in the basement, racks near the furnace make excellent storage spots for products needing warm dry storage conditions.

Temporary storages may be made in driveways, empty grain bins, or idle brooder houses.

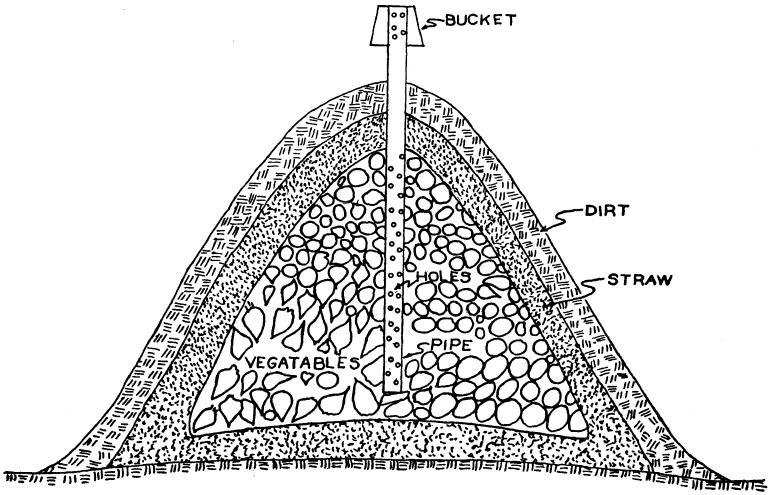

Fig. 6—Cross section of mound or pit type storage.

STORAGE EQUIPMENT

No storage is of much value unless it is equipped with shelves, bins, racks, boxes, etc., in which and on which food products can be conveniently arranged. In general all storages should be equipped with false floors under all bins, boxes, racks, and shelves to provide ventilation (see Fig. 7 and 8). Shelves, racks, and bins should be built an inch from the wall, and the floors of shelves and racks should have inch spaces between the boards to provide ventilation. In stacking crates of produce on racks leave them an inch apart to give free ventilation. Bins and boxes used for fresh root vegetables or potatoes should be shallow to avoid packing these products too deeply.

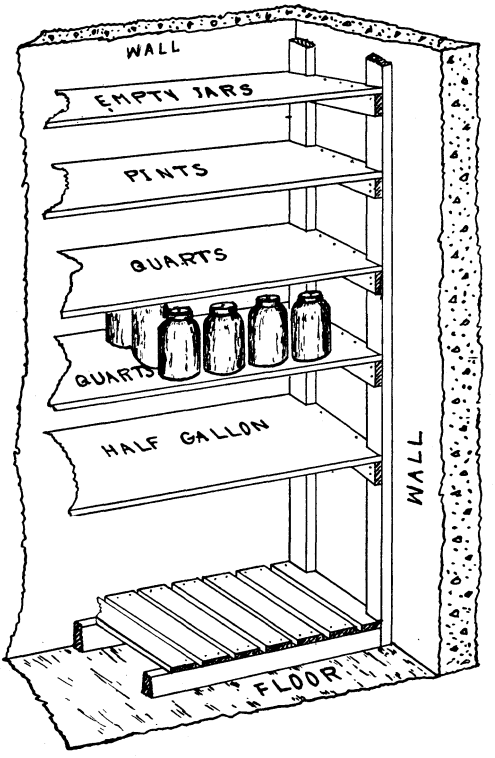

Fig. 7—Suggested arrangement for storage of canned foods.

Shelves should be built to allow three inches clearance above the jars and wide enough for the jars to set three deep. Use the top shelves for empty jar storage.

Racks are used to store onions, cabbage, and sweet potatoes in slatted crates or for pumpkins and squash. The space next to the floor should be used for boxes of root vegetables or Irish potatoes.

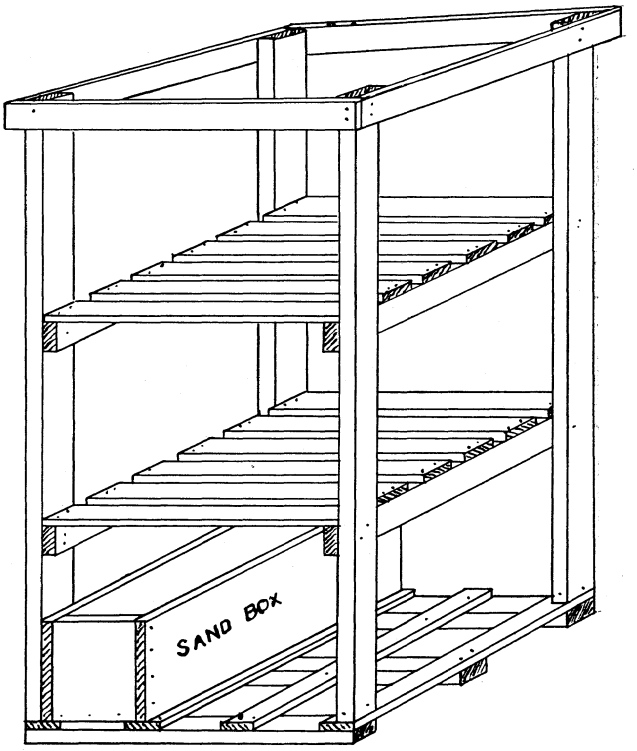

Fig. 8—Suggested rack arrangement for storage.

Boxes should be set on false floor racks to allow free ventilation. To keep root vegetables moist, clean damp sand or sawdust may be used. A good storage spot for cabbage is directly over boxes of root vegetables.

In figuring the space required to store root vegetables, onions, cabbage, and potatoes allow 1¼ cubic feet of storage space for each bushel to be stored.

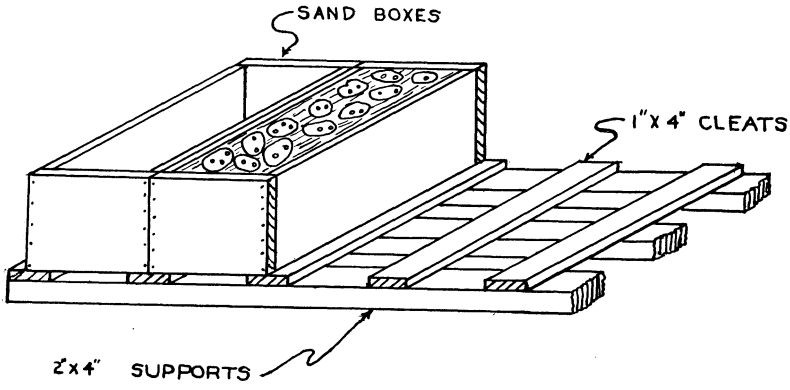

Fig. 9—Suggested arrangement of boxes or bins for the storage.

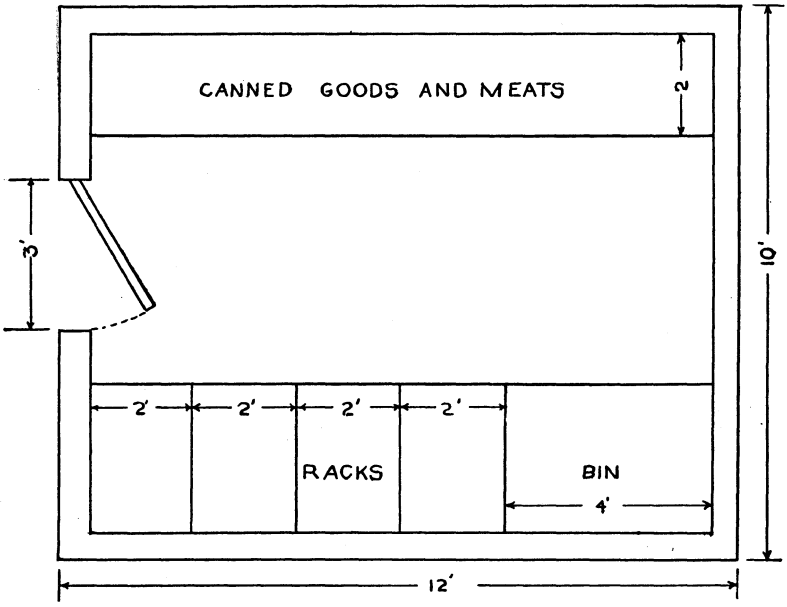

Fig. 10—Suggested floor plan for a general farm storage.

Figure 10 suggests an arrangement of storage areas in a general one structure farm storage. For arrangement in cross section of such a storage see Figure 1.

CANNED FOODS

The successful storage of canned foods requires cool but not freezing temperature, little or no light, dry air, proper ventilation, shelving, and location.

TEMPERATURE: Even, cool temperature (32 degrees to 50 degrees F.) at all seasons is most desirable. Too high a temperature favors spoilage. A freezing temperature causes undesirable changes in texture and flavor of food and sometimes breaks the seals of glass containers which results in spoilage.

LIGHT: Certain fruits and vegetables, canned in glass, lose color when exposed to strong light for long periods of time. Studies are now being made which **indicate** that exposure to light for given periods of time causes a considerable loss of certain vitamins in certain canned foods. This means that foods canned in glass should be protected from too much light.

MOISTURE: Dry storage is very important for foods canned in tin (because of rust) and is desirable, also, for those canned in glass.

VENTILATION: Ventilation is not so essential when only sealed containers are used. However, it is a factor in regulating temperature and moisture. Ventilation may be secured by means of openings at the top and bottom of the storage. See diagrams 1, 2, 3, and 4.

SHELVING: Well planned shelving for the storage of canned foods conserves storage space and adds greatly to ease and convenience when removing for use.

Shelves may be movable and adjustable as to distance apart. An interval of three inches is satisfactory, the lowest slat being placed nine inches from the floor.

If shelves are stationary, determine the number of shelves needed for each type of jar, pints, quarts, etc. In each case allow only three inches space above each. This will give room for removing jars from shelf and will still conserve total space. See Figure 7.

Arrange for one vacant shelf for storage of empty jars. Arrange for one deeper space for egg crates, lard cans, etc. Fifteen to 18 inches is a good width for this platform. See Figure 7.

Width of shelves is determined by the number of rows desired. Twelve-inch boards will accommodate two rows

of glass jars or tin cans and three or four rows of bottles or jelly glasses. Two, six-inch boards set one-half inch from the wall and one-half inch apart will accommodate three rows of glass quart jars.

For estimating amount of shelving, the following is a good working basis: Pint and quart glass jars—19 feet per 100 jars, stored two rows to shelf. Pint and quart glass jars—11 feet per 100 jars, stored three rows to shelf. Half gallon glass jars—20 feet per 100, stored two rows to shelf.

Arrange all jars of a kind together. For example, arrange tomatoes so that tomatoes run back the full depth of the shelf. If so arranged, the front jar will indicate what is back of the front row. If there are just three or four glasses of plum jelly, let them run three or four deep, rather than lengthwise of shelf. This will prevent searching for foods.

The order of storing the various foods is primarily a matter for each homemaker to determine. Some prefer to store vegetables or fruit in the order they are canned, beginning with greens, peas, beets, beans, etc. Others prefer to arrange them according to use in meal planning, greens, tomatoes, other succulent vegetables, starchy vegetables, etc. After a satisfactory order of storage has been determined, it is a part of good management to use the same plan year after year.

Location of Storage Room

Since canned foods are used daily during the greater part of the year, they should be stored as near the kitchen as possible. The work center, where the canning is done, is also a determining factor.

For the house where canning is done in the kitchen the food-storage room may be located off the back porch or entry, with a door on the porch side and one on the ground level; sometimes it is possible to locate the first-floor storage room so that only one door at grade level is needed and access from the kitchen side is provided by a **pass window.** If such a pass window is installed, a shelf on both the storage-room and kitchen side should be placed on a level with the sill.

If the food-storage room and the workroom where canning is done are located in the basement, a desirable feature is an outside basement stairs, wide enough to permit large containers to be carried wthout difficulty, and with a slope of not more than 33 degrees.

If a cellar or separate house is used, it, too, should be as accessible as possible to the kitchen or work center.

STORING VEGETABLES

Farm families can assure themselves of a year around vegetable supply by tending a carefully planned home garden of adequate size to furnish fresh vegetables in season and provide a surplus for canning, drying, and storage in the fresh state.

Storage is a cheap and satisfactory means of preserving vegetables for use during periods when they cannot be grown in the garden. It is cheaper and requires less labor than canning.

Food costs can be reduced by having a stored supply of fresh vegetables ready for use to say nothing of the added value that comes from the satisfaction of a healthy, well-fed family.

The average Oklahoma season will require the storage of vegetables two periods during the year, in the summer while the weather is hot between the spring and fall gardening seasons, and during the winter when cold weather makes gardening impossible. Storage during the winter is not difficult, while summer storage requires a little more care. Successful storage is possible, however, either in summer or winter if the simple storage requirements of the different kinds of vegetables are provided.

Successful storage requires a good product to start with, and the stage of maturity when harvested has a lot to do with storage. In general, vegetables for storage should be mature or at their most edible stage. They should be graded and only those that are of high quality, sound, and free from injury, either mechanical, insect, or disease, should be stored. A high quality product handled carefully and stored under the correct temperature and moisture conditions assures the person who stores with care a high quality product for use.

In planning the home garden it is well to include enough of the following vegetables, which store well in the fresh state, to assure an ample supply for storing.

Vegetables Requiring Cool Moist Storage

Beets	Winter Radishes
Carrots	Salsify
Parsnips	Cabbage
Rutabagas	Brussel Sprouts
Kohl Rabi	Turnips

The ideal storage condition for these crops is a moist place where the temperature ranges from 33 to 36 degrees Fahrenheit. They can be stored in boxes or bins, in cellars, basements, or houses, and outside in mounds, trenches, pits, or buried in boxes or barrels. Root crops may be covered with clean moist sand to provide moisture required for cabbage and related crops in cellars or basements. Boxes of mixed vegetables can be buried and dug up as needed to supply a variety of products for use during the winter.

Vegetables Requiring a Warm Dry Storage

Winter Squash Pumpkins

These crops store best in dry places where the temperature ranges from 50 to 55 degrees Fahrenheit. Barn lofts, attics, or on racks near the top of the cellar or basement are the best places to store these crops. If the basement houses the furnace, racks near it are a good place to store these crops. It is well to let the pumpkins and squash mature several days after they are pulled from the vine before putting them in storage, and never pile them up but spread them out so that they are only one tier deep.

Vegetables Requiring a Cool Dry Storage

Onions Garlic

These crops store best in dry places where the temperature ranges from 34 to 38 degrees Fahrenheit. The ventilated pantry, and the cooler portions of the barn loft, attic, cellar, or basement make the best storage spots. Onions and garlic should be thoroughly matured before they are stored. They can be tied in bunches and hung in driveways. However, they should not be allowed to freeze. When larger amounts are to be stored, slatted crates make excellent storage containers. They should be stacked with alleys to give plenty of ventilation.

Storing Irish Potatoes

Irish potatoes keep best in cool moist storage where the temperature ranges from 36 to 40 degrees Fahrenheit. Since most Oklahoma potatoes are grown in the spring and since they must be harvested while immature, just as the leaves start to turn brown, careful handling is very important if storage is to be successful. Irish potatoes should never be left in the ground after soil temperatures reach 90 to 95 degrees Fahrenheit, as the tubers are damaged by high temperatures and cannot be stored successfully. Potatoes should be picked up immediately after the plow and gotten

into the shade at once. Before going into storage potatoes should be cured for from 10 to 14 days in crates, sacks, or baskets, either in the cellar or in some other cool well ventilated place. At the end of the curing period the potatoes should be sorted from the curing containers into the storage bins. This preliminary "curing period" is also desirable if potatoes are to be stored in cold storage. On the farm, shallow bins or boxes in the cellar or basement are the best place to store Irish potatoes. If the air is not moist enough pans of water on the floor will serve to prevent undue shriveling.

Storing Sweet Potatoes

Sweet ptatoes require a dry warm storage at temperatures ranging from 50 to 60 degrees Fahrenheit. Sweet potatoes should be dug before heavy frosts kill the vines, since frosts or even cold weather may injure the roots that lie near the top of the ground. Should frost occur before the potatoes are dug the vines should be cut immediately to prevent "frosted sap" from reaching the roots. For best results sweet potatoes should be cured out at temperatures of from 85 to 90 degrees F. for 10 to 14 days before going into storage. This curing can be accomplished by stacking slatted crates of sweet potatoes around the cook stove if only a few are being grown for home use. Regular heated curing houses built for the purpose are best if sweet potatoes are being grown for market. A lot of storage difficulties come from careless harvesting practices that injure the roots. Every care should be exercised to avoid mchanical injury during harvest, and the potatoes graded rigidly before curing and storing. Cull sweet potatoes make good livestock feed and can best be utilized in this manner.

Sweet potatoes can be stored in slatted crates, stacked to allow free circulation of air, in barn lofts, attics, or in racks in cellars and basements. Shallow bins may be used if they are located in a warm dry section of the storage.

Tomatoes

Tomatoes require a moderately moist warm storage and even under ideal conditions cannot be stored for long periods. However, if all green-ripe fruit is picked prior to frost it can be stored successfully and will prolong the tomato season for several weeks. The green-ripe fruit are those that show white at the blossom end, since the tomato ripens from the inside out. These fruits, stored where the temperature ranges from 50 to 55 degrees F., will ripen normally. The

green-ripe fruit may be packed in boxes a layer of fruit and a layer of straw, then another layer of fruit, or they may be spread out in a single layer on shelves. Waxing the stems of tomatoes also prolongs their storage period. Either beeswax or paraffin, or a mixture of these, may be used for this purpose. Whole vines of tomatoes may be pulled and hung inside when danger of frost approaches. The green fruit can be made into relish and the green-ripe fruit left on the vines to ripen for use in the fresh state.

Beans and Peas

Dry beans and peas can be stored for use throughout the year if the weevil hazard is overcome. To beat the weevil to these crops harvest and shell them immediately after they mature. Do not leave them on the vine thinking that weevils won't get to them, for this is the ideal place for weevils to start their dirty work.

Several chemicals can be used to kill weevils in beans and peas but for general use carbon bisulphide (commonly called high life) is as good as any of them, and if used according to directions it will not injure the germination or food value of dry beans or peas. Carbon bisulphide is inflammable, therefore care should be exercised when using it to keep it away from lanterns, lamps, burning matches, and lighted pipes or cigarettes. Two ounces of the chemical, which can be purchased at drug stores, will treat 50 pounds of beans or peas. Put the beans or peas in an air tight container and pour the carbon bisulphide into a saucer on top and cover tightly. Leave for from 24 to 36 hours, then open and air the beans or peas and store them in another air tight container that is free from weevils. Keep the container covered to keep the weevil from getting in again. It can readily be seen that the beans or peas must be completely mature and thoroughly dried out before they can be stored successfully. Two thicknesses of cheese cloth tied securely over the mouth of a lard can full of beans or peas will keep the weevil out and at the same time prevent the beans or peas from getting musty.

Storing Fresh Fruit

In general, with the exception of apples, pears, and possibly late maturing grapes, fruits cannot be stored successfully without cold storage facilities. The general requirements for storing all fruits are a moist, cool storage held at a temperature close to 32 degrees F. Under these ideal conditions apples and pears will keep from two to six months, grapes from three to four weeks, peaches from one

to two weeks, and other fruits from a week to 10 days.

Apples and pears, especially late maturing varieties, can be stored successfully in shallow bins or boxes in cellar or basement storages, or in mounds or pits. The fruits to be stored should be allowed to ripen on the trees, and should be graded carefully to avoid storing unsound fruit damaged by insects or diseases. Fruit to be stored should be handled carefully to avoid bruising. Proper ventilation is important in apple and pear storages.

Late maturing varieties of grapes can be stored for a week or so by packing the bunches in damp sawdust or clean moist sand and keeping in the coolest part of the storage.

MEAT STORAGE

Meat may be satisfactorily stored on the farm only when approved methods of feeding the animal, handling, butchering, and curing are followed.

Healthy, well-fleshed animals that are moderately fat should be selected for the farm meat supply. In all cases, they should be kept off feed at least 12 hours before butchering but may have access to a limited amount of water. Proper bleeding of the carcass is one of the first essentials to prevent spoilage of the meat. If an excess of blood remains in the carcass, spoilage will occur much more readily. Better bleeding will result if the animal is handled quietly, and driving and overheating are avoided. If these precautions are followed, and butchering and cutting of the carcass are done under sanitary conditions, the farmer can readily cure and store his meat so that it will keep for several months.

Under most Oklahoma conditions, the brine cure for pork is more satisfactory than the dry cure. The brine cure is prepared by mixing 12 pounds of salt, 3 pounds of brown sugar, and 3 ounces of saltpeter, together with pepper and other ingredients that may be added to suit the taste. This mixture, in 6 gallons of water, is sufficient to cure approximately 100 pounds of meat. About three days will be required for each pound in each cut to secure a good cure. For example, a 12-pound ham will need to be left in the cure barrel for 36 days, and a cut weighing five pounds will need to remain in only about 15 days.

While smoking is not essential for curing meat, it is considered advisable because of the fact that it improves the flavor and has a moderately drying effect on the meat which is helpful in storing it under humid weather conditions. While the smokehouse need not be expensive, a smokehouse built of stone, brick, or other fireproof material is safer than a frame structure and will also maintain a more even temperature, which is important in smoking and storing meat.

Good storage is somewhat dependent on weather conditions. It has been found that a cool, dry, well-ventilated cave is one of the best places for meat storage.

The simplest method of storage is to wrap the smoked meat in several thicknesses of heavy white paper and then place it in an insect-proof sack. It may then be hung in a cool, dry place or buried in an oat bin. While this method may be satisfactory under favorable conditions, additional precautions may prevent loss and result in a more palatable

product. If the meat is wrapped in paper, as indicated, and then buried in air-slacked lime, it will not become excessively dry, and there is no danger of insects coming in contact with the meat. However, there is some danger from mold developing from this method. If mold develops, it may be retarded by removing the cuts of meat from the lime box and wiping with a cloth saturated with vinegar. If the storeroom is cleaned and well-ventilated, the mold will probably not occur again.

Another method is known as the yellow wash method. The meat is wrapped in heavy paper, placed in a muslin sack, and painted with a yellow wash. A recommended mixture for this wash is as follows:

3 pounds barium sulphate
1 ounce powdered glue
1¼ ounce chrome yellow or yello ocher
6 ounces flour

Half fill a pail with water and mix in the flour. Break up all the lumps thoroughly. Mix the chrome yellow or ocher in a quart of water in a separate vessel. Add the glue and pour both into the flour and water. Bring the white mixture to a boil and add barium sulphate slowly, stirring constantly. Make the wash the day before it is to be used, stir frequently while using and apply with a brush. Following this treatment, the meat should be hung in a cool, dry place such as a cave or well-ventilated granary.

Another method of storing meat that has found favor in some sections of Oklahoma is through the use of cottonseed oil. Well-cured meat is brushed or rubbed with a damp cloth to remove all surface cure mixture. The meat is then packed in a crock or wooden container, and refined cottonseed oil is poured over the meat until it is covered at least an inch. This method prevents mold growth and also keeps the meat relatively moist and palatable. A cut of meat may be removed when needed and the unused pieces returned to the oil for keeping. While this method of storage may be more costly than others, the cost can be reduced by keeping the oil for use over a period of three or four years. This may be done if pure, refined cottonseed oil is used and the oil is strained after each using to remove dirt and other foreign material.

The storage of beef and lamb for farm use is best accomplished through canning or the use of a cold storage locker. Under some conditions, however, both beef and lamb

may be cured and stored on the farm for limited periods.

The following directions will be satisfactory for corning beef. The brisket, navel, and rump of beef are the best cuts for corning. The meat should be cut into five or six-pound chunks and placed in a brine cure made with a solution of one and a half pounds of salt, one ounce of saltpeter, one-fourth pound of brown sugar and one gallon of water. The meat should be kept in the solution at least two weeks although it may be used out of the brine at any time. At the end of two weeks, it should be removed and given a light smoke to improve the flavor.

Lamb may be satisfactorily cured with a brine solution consisting of eight pounds of salt, two pounds of brown sugar, two ounces of saltpeter and six gallons of water. Cuts will need to remain in the cure from 14 to 30 days, depending on the size. They may be removed from the brine and consumed at any time. If the lamb is to be kept for sometime, it should be removed from the brine and soaked in water for two hours. After drying, it may be given a light smoke and stored with the air-slacked lime method as used on pork.