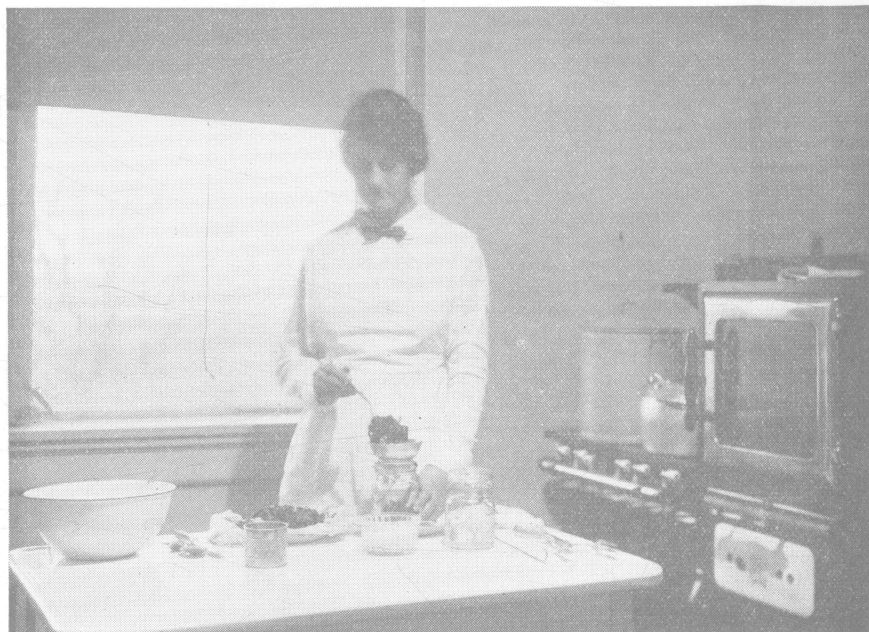


Home Canning of Fruits, Vegetables, and Meats



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Home Canning of Fruits, Vegetables, and Meats

A closet filled with jars of tempting fruits and vegetables is a source of pride to any home maker who has learned the art of canning for winter use. Sweet corn, fresh spinach, luscious strawberries, and peaches gathered when too abundant for immediate use and promptly canned, mean not only a saving of the family income but a measure of health and happiness for those who possess them.

Many vegetables and some fruits can be stored and kept without canning, but the green vegetables which also contribute so much to health and which can give such great variety to the winter food supply cannot be stored.

Anyone who is interested in learning how to can must be willing to follow directions carefully, and those who understand the principles involved in the process are practically assured of success.

Causes of Spoilage

Foods are spoiled by the action of bacteria, yeasts, and molds, unless preserved in some way. A method which keeps these organisms inactive or destroys those present and excludes others may be used if it does not injure the product.

Food is commonly protected from the action of bacteria, yeasts, and molds by drying, refrigeration, canning, or by the use of such preservatives as salt, sugar, vinegar, and spices. It is unnecessary and unsafe to use the chemical preservatives sometimes sold as canning powders.

Molds, yeasts, and bacteria are found everywhere. They are present in the air, are numerous in dust, and on the surface of fruits and vegetables.

Molds.—Everyone is familiar with molds, in their growing form. In the inactive form they are so tiny that they cannot be seen with the naked eye, but because they are always present, molds develop wherever they find suitable food, moisture, and warmth, thriving best in dark, damp places. They may be destroyed by boiling.

Yeasts.—Every housewife knows something of the character of yeast as used in breadmaking, but not everyone is aware that there are tiny yeast plants everywhere. When provided with moisture, warmth, and suitable food, yeasts develop rapidly. They give off bubbles of gas and eventually cause the food material in which they are growing to become sour. The presence of active yeast in a jar of canned goods which has not been properly sterilized, may be detected by the formation of bubbles which rise to the top.

Bacteria.—Bacteria are found everywhere and may occur in either an active or resting form. In the active form they are killed by a high temperature, but in the resting form have been found to resist the heat of boiling for several hours. They are, however, more easily destroyed by heat in the presence of acid. It is largely because of this fact that bacteria rarely cause spoilage of canned fruits, tomatoes, and rhubarb.

Methods of Canning

There are two methods of home canning in common use: the open kettle, and the cold-pack or can-cooked method.

The Open Kettle Method

In using this method, the food is cooked in an open kettle, placed in a hot sterile jar and sealed. This method is fairly successful in canning acid products such as fruits, tomatoes, and rhubarb, but cannot be recommended for general use. The rubber rings and jar covers, as well as the jars, must be thoroly boiled to insure the destruction of the bacteria, yeasts, and molds which may be present.

The Cold-Pack or Can-Cooked Method

Best results are obtained by this method as the flavor, color, and shape of the products are retained and there is a smaller percentage of spoilage. This method is satisfactory for all products and is the one described in detail in this bulletin. In using this method the fruit, vegetable, or meat to be canned is packed in the jar which is partially sealed and cooked to sterilize the contents and the jar. This cooking is called processing. It may be accomplished in any one of the following ways.

One-period sterilization in a hot-water bath has been found satisfactory and has been recommended by the United States De-

partment of Agriculture for the northern and western states. It is recommended for use in this State as a process which produces good results with a minimum of time and effort.

Intermittent sterilization as used in canning consists in processing jars of products in a hot-water bath for a certain period on each of two or three successive days. It is in general use in the southern states and gives satisfactory results, but because it does not seem necessary in this climate and because of the additional time, labor, and fuel required it is not recommended for general use in this State.

Sterilization under steam pressure requires the use of a pressure cooker. By this means sterilization is accomplished in a shorter period of time than is required in a water bath, because of the higher temperature at which the product is processed.

Equipment Needed in Canning

Canners

There are three types of canners in general use: the water bath, water seal, and steam pressure.

Water Bath

For sterilization in a water bath very simple and inexpensive equipment may be used. It is necessary to have a deep can or boiler with a tight-fitting cover and a rack on which the jars may rest. The can or boiler must be deep enough so that there may be at least 2 inches of water above the tops of the jars and sufficient space for the boiling of the water. The size of the can or boiler should be determined by the number of jars to be processed at one time.

A wash boiler has a capacity of from eight to fourteen quart jars. A large lard can has a capacity of four to six quart jars. An ordinary ten-quart galvanized pail may be used if fitted with a tight lid. Such a pail holds three quart jars.

A rack is necessary to keep the jars off the bottom of the boiler to prevent breakage, and should be so constructed that there may be free circulation of boiling water around and under the jars. Wire racks to fit the boiler may be purchased at a moderate price or may be made of heavy wire netting, cut to fit the bottom of the boiler and nailed to two or three strips of wood. A wooden rack to fit the vessel may be made of narrow slats nailed on two or three

strips of wood. Individual jar holders, fitted with a bail for lifting, may be used in place of a rack. They are convenient and inexpensive. There are tongs made especially for lifting hot jars from the water bath.

The following directions should be observed in using a water bath for processing.



Fig. 1.—Ordinary water pail with wood crate bottom makes a satisfactory water bath

1. Choose a can or boiler of suitable size for the size and number of jars to be processed at one time. For example, if only three or four jars were to be processed it would be very wasteful of time and fuel to heat the amount of water required to process them in a wash boiler.
2. Have water in the boiler at or near the boiling point so that the jars to be processed may be put in as soon as they are ready.
3. Place each jar in the boiler as soon as it is ready to be processed. After all of the jars are in the boiler see that there is a depth of at least 2 inches of water over the tops of the jars.
4. Cover the boiler closely to prevent evaporation.

5. Bring the water to the boiling point as quickly as possible and note the time that boiling begins.
6. Counting from the time the water begins to boil, process the jars for the length of time indicated in the Time Table for Blanching and Processing (page 28).

Water-Seal Canners

There are canners on the market so constructed that a few degrees above the boiling temperature may be maintained with the use of a small amount of water, thereby saving fuel and shortening the cooking period. This type of canner consists of a double-walled bath and a cover which extends down into the water between the walls. This forms a water seal.

Water-seal canners vary according to their manufacture, and are usually accompanied by printed directions. Altho these may not give complete information as to the method of processing, it is advisable to observe the instructions for operating and caring for the canner. The following general suggestions are made:

1. Precaution should be taken to determine that the boiling point is reached before counting the time of processing. This may be observed by the use of a thermometer.
2. Counting from the time the water begins to boil, process the jars for the length of time indicated in the Time Table for Blanching and Processing (page 28).

Steam-Pressure Canner

There are a number of kinds of steam-pressure cookers or canners on the market. Some are made of aluminum and some of boiler iron. They are so constructed as to obtain a temperature much higher than that of boiling water. This is accomplished by a special construction for holding the lid firmly in place with clamps, thus retaining the steam. The cookers are equipped with a safety valve, a steam petcock, and an indicator which registers the steam pressure.

Pressure cookers made of aluminum are light and easily handled. They may be obtained in sizes which hold three to seven quart jars. Iron cookers large enough to hold twelve or more quart jars may be obtained, but because of their greater weight they are not so well adapted to home use.

While the first cost of a steam-pressure cooker or canner is high, its use is recommended for the canning of meats and vege-

tables which require a long period of processing. Steam-pressure canners have the following advantages: (1) very little time is required to heat the water, as only a small amount is used; (2) the period of processing is much shorter than is required in a water bath, thereby saving time, energy, and fuel; (3) a sufficiently high temperature may be maintained during the cooking process to kill all harmful organisms present; (4) the smaller pressure cookers may be used thruout the year for cooking vegetables, cereals, and

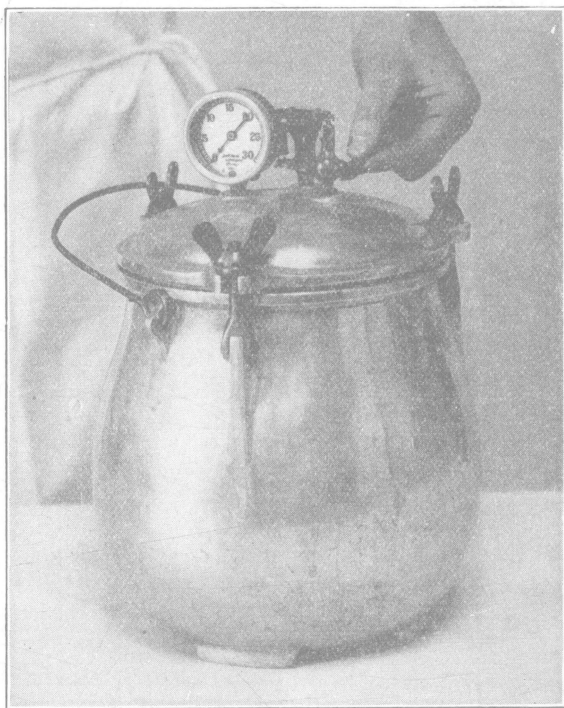


Fig. 2.—One type of steam-pressure canner

meats for table use in a much shorter period of time than the ordinary method would require; (5) eliminates greater amount of heat from the kitchen during canning process; (6) reduces spoilage to a minimum when canning vegetables and meats.

Pressure canners vary according to their manufacture and are usually accompanied by printed directions. Altho these may not give complete information as to the period of processing, it is advisable to observe the instructions for operating and caring for the canner.

The following general rules and precautions should also be observed:

1. Pour enough water into the canner so that the level of the water is just below the rack on which the jars are to be placed. Have the canner on the fire and see that the water is boiling when the jars are ready to be processed.
2. Put in the jars. Adjust the lid of the canner.
3. Have the petcock on the cooker open until steam escapes in a steady stream, indicating that the air has been expelled.
4. Close the petcock and keep it closed during the cooking process.
5. Refer to the Time Table for Blanching and Processing (page 28) to decide upon the desired pressure and period required for processing.
6. Bring the pressure to the desired point slowly and note the time when this pressure is reached. Process for the required length of time, keeping the pressure stationary during the entire period.
7. At the end of the processing period, turn out the fire or remove the cooker from it. The pressure will gradually drop to zero. Let the pressure indicator stand at zero for a few minutes before opening the petcock.
8. Open the petcock gradually, allowing the steam to escape slowly. When no more steam comes thru the petcock, release the clamps, open the cooker, take out the jars, and seal them immediately.

Glass Jars

For home canning, glass jars have been found to be more practical and economical than tin cans, and if handled with care, last for years. There are several types on the market which are adapted to home canning.

Mason Jars

The mason jar is an old standard type of jar. It seals with a metal screw top lined with porcelain. This jar is satisfactory if the top is in good condition. It should be clean, the porcelain unbroken, and the rim regular. Mason-jar tops are often spoiled for future use by being bent in opening the jar. New tops may be purchased at small cost and should be used if old ones are not in perfect condition. The shoulders of a jar must be free from indentations and irregularities to make possible a perfect seal. To test a mason jar, screw on a top. If there is much more space than the thickness of a finger nail between the edge of the lid and the jar, a perfect seal cannot be made.

Spring-top Jars

The spring-top jar has a glass top fastened with a wire clamp. This type of jar is very satisfactory, easy to clean and to seal. Except in case of breakage the tops may be used indefinitely. When placed on the jar the top should fit evenly and not rock. Home canners are cautioned to see that the wire which fits over the top is just tight enough to hold the lid firmly in place during the period of processing. The clamp is pressed down to seal the jar after the processing is complete.

Automatic-seal Jars

Automatic-seal jars have a metal lid which must be replaced every time the jar is used. This jar is sealed by the use of an adhesive compound which softens and adheres when heated. To make possible a perfect seal the compound must be in good condition and distributed evenly on the lid where it comes in contact with the jar. This type of jar is not adapted to intermittent sterilization.

Tests for Jars

Examine all glass jars and tops before using them to see that a perfect seal is possible. Irregularities of the shoulder on which the lid rests or an imperfect top may cause leakage. If in doubt about a jar, fill it with water, put on the rubber and top, invert the jar and examine for leakage.

Rubbers

Good rubbers are essential to successful canning and it is wise to buy the best quality available. Never use a rubber the second time. As rubber deteriorates with age unused rubbers left over from one year to the next should be tested as they may be unfit for use.

Test for rubbers.—A good rubber is soft, pliable, and elastic, and tends to return to its original size after being stretched. When folded a good rubber does not crack.

Canning by the One-period Cold Pack or Can-cooked Method

General Directions

Selection

Select fresh, sound materials for canning. Success in canning vegetables depends largely upon having them canned when fresh from the garden or as soon as possible after they are gathered. Fruits should be ripe, but not overripe. It is impossible to obtain a first-class product from stale, unsound, or inferior materials.

Grading

Grade all materials according to size and quality. Uniformity adds to the desirability of the product. Very ripe material, if packed with that which is less ripe, has a tendency to cook to pieces before the latter is sufficiently cooked.

Cleansing

Wash the fruit or vegetable to be canned thoroly in clean water. Small berries, beans, and peas are more easily handled by washing in a sieve or a colander under running water.

Preparation

Prepare the material by peeling, seeding, coring, or cutting into pieces, as desired. In a general way preparation for canning is the same as for cooking. Vegetables that are slightly wilted may be freshened by soaking in cold water before blanching.

Blanching

Some products require blanching before packing in the jars. This may be done by submerging the prepared materials in boiling water or subjecting them to the action of steam. Blanch only enough material for one or two jars at a time. The material to be blanched may be placed in a square of cheesecloth, a cheesecloth bag, or a wire basket. When blanching in boiling water use at least 4 quarts of water to each quart of vegetable or fruit. To blanch in steam, place the material in cheesecloth or a wire basket, and suspend it over boiling water. The vessel should be closely covered during the blanching. For the length of time for blanching products see the Time Table for Blanching and Processing (page 28).

The time for blanching should be counted from the time the water boils after materials have been added. Always remove the material from boiling water or steam immediately at the end of the blanching period. As a general rule all vegetables should be blanched.

Products for canning are blanched for the following reasons: (1) to shrink the material; (2) to drive off intercellular gases (as in green beans) and remove objectionable flavors; (3) to rid such vegetables as peas and beans of outer mucous covering, and (4) to set the milk in corn.

Scalding

This does not differ in method from blanching tho it has a different purpose. It is used for such products as tomatoes and plums in order to make it possible to remove the skin easily and to intensify the color. These products are scalded in boiling water just long enough to loosen the skins. They are then cold dipped, after which the skins may be easily removed.

Cold Dipping

This follows blanching and scalding so closely that it may be considered a part of either process. Immediately after removing the products from the steam or boiling water immerse them several times in a large quantity of cold water, or allow cold water to run over them in a colander. This should be done quickly. Do not allow the products to remain in the water until they become cold.

Products are dipped in cold water: (1) to cool the material so that it may be handled; (2) to set the color which has started to flow during the blanching process; (3) to further cleanse the materials and harden the pulp.

Filling Jars

Pack the food materials as soon as possible after cold-dipping into clean, hot jars to within $\frac{1}{2}$ inch of the top. Vegetables such as corn, peas, and shelled beans should not be pressed into the jar, as they expand in cooking. Fruits may be packed firmly, but should not be crushed. In packing greens and vegetables in pulp form, allow space for the addition of liquid. Cut thru the contents of each can of greens at right angles after packing to allow heat to penetrate to the center of the mass.

Uniformity of arrangement adds materially to the appearance of the pack. A thin, flexible knife or spatula is an aid in packing. The pack should be loose enough so that when the jar is inverted the contents will slide easily and quickly toward the neck of the jar.

As soon as a jar of vegetables is packed pour in boiling water to within $\frac{1}{2}$ inch of the top of the jar. Add a level teaspoon of salt to each quart jar of vegetables. Into jars of fruit pour boiling water or sirup to within $\frac{1}{2}$ inch of the top. If air bubbles form under the shoulder of the jar, remove them by pressing the contents gently away from the side of the jar with a spatula or a knife. Add more liquid if necessary to bring the level of liquid to $\frac{1}{2}$ inch of top.



Fig. 3—Well-packed jars of vegetables

If there is too much liquid or material in a jar the expansion which takes place in cooking forces the liquid out between the lid and the rubber. This is a common cause of the bulging of the rubber ring.

Adjusting the Tops on Jars

Before placing the rubber, wipe the shoulder of the jar with a clean, wet cloth. Dip the rubber into boiling water. Place the rubber on the jar. See that the rubber lies flat. Place the top on the jar, and partially seal it. If using a spring-top jar, adjust the wire which fits over the top and see that it is just tight enough to hold the top in place but do not press down the clamp. To partially seal a mason jar, screw the top down just far enough to hold it in place, but not far enough to press firmly upon the rubber.

The top is usually adjusted correctly if screwed on with the thumb and little finger.

Processing

The jars should be placed in the canner as soon as they are packed and the covers adjusted. Process the jars immediately. See the directions for using various types of canners, pages 5 to 9, inclusive.

Sealing the Jars

When the period of processing is complete remove the jars from the canner, sealing each jar immediately upon removal *without lifting the tops for any purpose* unless the rubber is bulged or if for any reason it is impossible to make a perfect seal. In such a case, remove the top, adjust a new rubber or top as needed, partially seal the jar and while still hot return it to the cooker. After this has been done process fruits 5 minutes and vegetables 15 to 20 minutes. Remove the jar and seal it.

After sealing the jars, set them aside to cool. There is danger of breakage if they come into contact with anything cold or if they are exposed to a draft, but they should not be kept hot. Allow space between them for circulation of air. *Never screw down the top of a mason jar after it has once been tightened, as this may break the seal.*

After the jars are sealed, they may be inverted or laid on the side to test for leaks, but it is not necessary to do this as a mass of bubbles forming around the point of leakage indicates an imperfect seal, or a crack in the jar or lid. If an imperfect seal is discovered after a jar is cooled, open it and inspect the contents. Discard the contents if not good. It is not wise to reprocess.

Care of Canned Goods

When cool, wipe the jars with a cloth wrung out of hot water and label them. It is desirable to indicate the contents, grade, and date on the labels. Store the jars in a clean, dry place where they will not be overheated and where there is no danger of freezing.

Additional Points to Be Observed

1. One canning method should be decided upon and followed carefully. Combination of methods may result in spoiled products.

2. Practically all losses in canning are due to one or more of the following causes:
 - (a) The use of poor material.
 - (b) Over packing.
 - (c) Too short a processing period.
 - (d) Poor rubbers.
 - (e) Imperfect jars.
3. "Flat sour" of vegetables may be caused by allowing them to become semi-heated at any time before processing, by too slow heating to the boiling point, or by too short a processing period.
4. Lack of liquid in a jar at the end of the processing period will not cause it to spoil if properly sterilized and sealed, but makes the pack less attractive. Lack of liquid in the jar may be due to one or more of the following causes:
 - (a) Blanching was not completely or properly done.
 - (b) Too much material was packed into the jar leaving too little space for liquid. The material and liquid should be $\frac{1}{2}$ inch from the top of the jar before processing.
 - (c) Air bubbles were not expelled from the jar before it was processed.
 - (d) The water level in the water-bath canner was allowed to be below the tops of the jars.
 - (e) The pressure in the pressure canner was not reduced sufficiently before opening the petcock.
5. A partially filled jar of food will keep if properly sterilized and sealed, altho it is not as attractive as a full jar.
6. Discoloration of liquid as well as of the vegetable in a jar may be caused by the use of water containing quantities of minerals.
7. It is found convenient in canning quantities of vegetables to dissolve the salt before putting it in the jar. Four tablespoons or $2\frac{1}{2}$ ounces of dry table salt to 1 gallon of water approximates 1 teaspoon of salt to 1 quart of material.
8. Do not can vegetables in two-quart jars. This precaution applies especially to spinach and corn because it is difficult to heat this mass of material to the boiling point.
9. When fruits float on top of the sirup it is because the sirup is heavier than the fruit. This difficulty may be largely overcome by using a lighter sirup, and by preparing the fruit in such a way that it becomes saturated with sirup.

Special Directions for Canning Vegetables

Asparagus

(See the General Directions for Canning, page 11.)

Can only fresh asparagus. Grade it as to size and maturity. Wash thoroly. The tender stalks of even length may be canned whole. Cut the stalks the length of the jar and tie them in bundles. From the remaining asparagus break off the tough part of the stalk as far down as it will snap. Cut the tender parts into pieces of any desired length. Blanch the asparagus in boiling water just long enough to make the stalks flexible (from 2 to 3 minutes), leaving the tips out of the water half of the time. Over-blanching causes asparagus to become soft and mushy. Cold dip the asparagus immediately and pack it into the jars. Add salt and hot water. Partially seal and process. For the time required for processing see the Time Table, page 28). Seal the jars, cool, and store them.

String Beans

(See the General Directions for Canning, page 11.)

Use only fresh, tender, string beans for canning. Wash them thoroly, remove the strings and tips. If desired, cut the pods into short lengths. Blanch from 5 to 10 minutes or until the pods are flexible. Cold dip and pack into jars. Add salt and hot water. Partially seal and process. For the time required for processing see the Time Table, page 28. Seal the jars, cool, and store them.

Sweet Corn

(See the General Directions for Canning, page 11.)

Among the best varieties for canning are Golden Bantam, Evergreen, and Country Gentleman. Select corn in the "milk" stage just before it reaches the "dough" stage. Can it as quickly as possible after it is picked, as sweet corn soon loses its flavor. Remove the husk and silk. Blanch the corn on the cob 5 to 10 minutes to set the milk. If whole kernels are desired cut the corn close to the cob. Scrape out the remaining pulp, which may be canned for soup. If corn free from hulls is desired, cut off only the tips of the kernels, or score them and then scrape out the pulp, leaving the hulls on the cob. As corn swells during processing it should be *packed loosely* in the jars, leaving $\frac{1}{2}$ inch space at the top. Add salt and boiling water. Partially seal and process. For the time required for processing see the Time Table, page 28. Seal the jars, cool, and store them.

Greens

(See the General Directions for Canning, page 11.)

This term includes all plants used for greens, such as spinach, swiss chard, kale, young beet tops, and dandelions. Use only fresh greens for canning. They should be canned the same day they are picked. If slightly wilted they may be freshened by being soaked in cold water. For the time required for blanching and processing see the Time Table, page 28. After packing the greens into the jars cut across the contents at right angles with a sharp knife so that the heat may penetrate more quickly.

Peas

(See the General Directions for Canning, page 11.)

Select young, tender peas for canning and can them as promptly as possible after they are picked. For the time required for blanching and processing see the Time Table, page 28.

Tomatoes

(See the General Directions for Canning, page 11.)

Select sound, ripe tomatoes for canning. Scald the tomatoes just long enough to loosen the skins. Cold dip the tomatoes, remove the core with a sharp knife, and then remove the skins. Pack the tomatoes (either whole or in pieces) into hot jars, and press them down until enough juice is set free to cover them, or fill the spaces with strained, cooked tomatoes. As tomatoes contain a large amount of water, none should be added in canning. For the time required for blanching and processing see the Time Table on page 28.

Pumpkin and Squash

If one does not have good storage space it may be practical to can pumpkin and squash. Cut them in halves or quarters and remove the seeds. Steam the pieces of pumpkin or squash for from 20 to 30 minutes. Scoop out the pulp from the shells and mix enough water with it so that it may be dropped from a spoon. If desired, salt in the proportion of one teaspoon to a quart may be mixed with the pulp before putting it in the jars. Pack the pulp in hot jars to within $\frac{1}{2}$ inch of the top. If it has not been mixed with the pulp, add the salt. Partially seal the jars and process. Seal, cool, and store them according to the General Directions for Canning, page 11. For the time required for processing see the Time Table on page 28.

Sirup for Canning Fruits

Fruits are commonly canned in sirup. There is a tendency with home canners to use too heavy a sirup. This is not only wasteful of sugar but destroys the delicate fruit flavor and causes the fruit to shrivel. Sugar is not needed as a preservative in canning fruit, but is used to add to the flavor of the product. The amount of sugar to be used depends upon the acidity of the fruit, the amount to be packed in the jars, and to the individual taste. Acid fruits, such as sour cherries and plums, may be canned in heavy sirup, but fruits of mild flavor should be canned in light sirup.

By the use of the table given below it is possible to determine the proportion of sugar and water to use for making sirups of different density. Make the sirup by mixing the sugar and water and heating until all the sugar is dissolved. *Do not boil* canning sirups, as this changes the density.

*Table for Making Sirups**

	Sugar (parts)	Water (parts)	Approximate number of quart jars canned with 1 pound sugar
Light sirup or 20 percent.....	1	4	8 to 9
Medium sirup or 30 percent.....	1	2½	5 to 6
Heavy sirup or 50 percent.....	1	1	3 to 4
Very heavy sirup or 60 percent.....	1½	1	2 to 3

* Adapted from "Home Canning"—W. W. Chenoweth, Massachusetts Agricultural College.

The following suggestions are made for using sirups with a moderately close pack of fruit, but some families may find that even less sugar makes a palatable product. Mildly acid fruits such as peaches, pineapple, pears, and berries may be canned in 20 to 30 percent sirup. (See the table above.) Acid fruits, like plums and cherries, require 50 to 60 percent sirup. For a close pack use the 60 percent sirup because there is a greater amount of fruit to be sweetened.

Special Directions for Canning Fruits

Hard Fruits

(Apple, Pears, Quinces, and Pineapple)

(See the General Directions for Canning, page 11.)

Pineapple need not be blanched. For the time required for blanching and processing see the Time Table, page 28. Use 30 to 50 percent sirup.

Strawberries—Special Method

Prepare the berries for canning and measure them. For every quart of fruit allow 2 to 4 ounces of sugar as desired. The proportion of 3 ounces of sugar to a quart is satisfactory to the average taste. Place the berries and sugar in a kettle in alternate layers, reserving enough sugar to cover the last layer of fruit; cover the kettle and set it aside for from 10 to 12 hours. At the end of this period the berries will have given up a quantity of juice and will have undergone some shrinkage. Set the kettle on the fire and heat the contents slowly, stirring carefully to dissolve the sugar without crushing the berries. Remove the kettle from the fire. Pack the berries with their sirup into jars. Partially seal them, process, seal, cool, label, and store them according to the General Directions for Canning, page 11. For the time required for processing refer to the Time Table, page 28.

Strawberries canned in this way retain their color and flavor better than if canned in sirup, when the berries are shrunk before canning the jars will be full of fruit, making a much more attractive appearance than if sirup is used.

Small Fruits

(Without Sugar)

For use later in making pies, jelly, jams, etc., small fruits may be canned without the addition of sugar, sirup, or other liquid. The quality and flavor cannot be expected to be the same as that found in fruits with some sugar. However blackberries, blueberries, raspberries, currants, and grapes canned by the following method are considered excellent for use in pies and puddings.

Place the berries in a cheesecloth and blanch them in boiling water from 15 to 30 seconds (not long enough to make the juice flow). Grapes may be blanched or not, as desired. Cold dip the fruit quickly after blanching it and pack it into jars, shaking it down so that it is firm, but not solid. Partially seal the jars and process them from 15 to 20 minutes. Seal, cool, and label them according to the General Directions for Canning, page 11.

Canning of Meats

The successful home canning of meats makes possible a supply of fresh meat all the year, instead of an over-abundance during the winter season with a limited supply for the rest of the year. The equipment used for the canning of fruits and vegetables may be used for canning meats, but the pressure canner is recommended especially for this purpose because of the high temperature at which the meat may be processed. Care should be taken to use meat from healthy animals which have been killed and prepared in a sanitary manner.

Directions for Canning Uncooked Meats

Beef, Veal, Pork, and Mutton.—Cut the meat into small pieces, remove gristle, bone, and excess fat. If desired, the meat may be seared. Pack the meat into hot jars. To each quart of meat add 1 teaspoon of salt. Partially seal the jars, process, seal, cool, and label according to the General Directions for Canning, page 11. For the time required for processing see the Time Table, page 28.

Poultry.—Kill the fowl and draw it at once. Wash it carefully and cool it. Cut the fowl into pieces of convenient size for packing. If desired the meat may be seared to improve the flavor. Pack it immediately into hot glass jars. To each quart of meat add 1 teaspoon of salt. Partially seal the jars, process, seal, and label them according to the General Directions for Canning, page 11. For the time required for processing see the Time Table, page 28.

Directions for Canning Partially Cooked Meats

Beef, Veal, Pork, and Mutton.—Cut the meat into pieces of about $\frac{3}{4}$ pound in weight, and roast or simmer it for $\frac{1}{2}$ hour. Cut the meat into small pieces. Remove gristle, bone, and excess fat and pack the meat into hot jars. Add 1 teaspoon of salt to each quart of meat. Fill the jar with drippings from the roasting pan or liquid in which the meat was simmered. It is desirable to concentrate this liquid to one-half its volume by boiling before putting it in the jars. Partially seal the jars, process, seal, cool, and label them according to the General Directions for Canning, page 11. For the time required for processing see the Time Table, page 28.

Poultry.—Kill the fowl and draw it at once. Wash it carefully and cool it. Cut the fowl into pieces of convenient size; place them in a wire basket or cheesecloth, and simmer until the meat can be separated from the bones. Take the chicken out of the liquid. Concentrate the liquid to one-half its volume by boiling. Remove the bones, pack the meat into hot jars, add 1 teaspoon of salt to each

quart of meat. Add the liquid in which the chicken was cooked. Partially seal the jars, process, seal, cool, and label them according to the General Directions for Canning, page 11. For the time required for processing see the Time Table, page 28.

Canning of Fish

When fresh fish is plentiful it is sometimes desirable to can it. It should be prepared and canned as quickly as possible after it is taken out of the water. Both large and small fish may be canned successfully. The pressure canner is recommended for the canning of fish because of the high temperature at which it may be processed.

Clean the fish and remove the skin and large bones. Pack the fish into jars to within one inch of the top. To each pint jar of fish add 1 teaspoon of salt. Partially seal the jars, process, seal, cool, and label according to the General Directions for Canning, page 11. For the time required for processing see the Time Table, page 28.

Fruit Products for Home Use

Fruit products form an appetizing and wholesome addition to the every-day diet. Most people are fond of jams, jellies, and fruit butters used either as a spread or as a relish with the main course of a meal. These products may be easily and satisfactorily made with less sugar than is used when the old rule of "pound for pound" is followed. The recipes given on the following pages call for less sugar and are protected from mold and other organisms which cause spoilage by being sealed. In the "pound for pound" rule sugar was used as a preservative.

General Directions for Making Jelly

In order to make jelly, fruit juice containing pectin and acid is necessary. Sugar is added to improve flavor and texture, the amount needed depending on the acidity and concentration of the juice. The use of too much sugar conceals the delicate fruit flavor and produces a waxy jelly.

In making jelly, use only sound, fresh fruit which is just ripe or slightly underripe. Wash it thoroly.

Extraction of Juice

To extract juice from soft fruits use one-fourth to one-half as much water as fruit by weight; for hard fruits use equal weights of water and fruit. Cook the fruit in a covered kettle until soft and

remove from the fire. If using hard fruit let it stand for 10 minutes and then strain; if using soft fruits, strain at once.

The straining may be accomplished as follows: pour the contents of the kettle into a jelly bag and hang it up to drain, or pour the material into a square of good quality cheesecloth placed over a pan of suitable size. If a square of cheesecloth is used, gather up the ends to form a hammock and drain off the free run juice

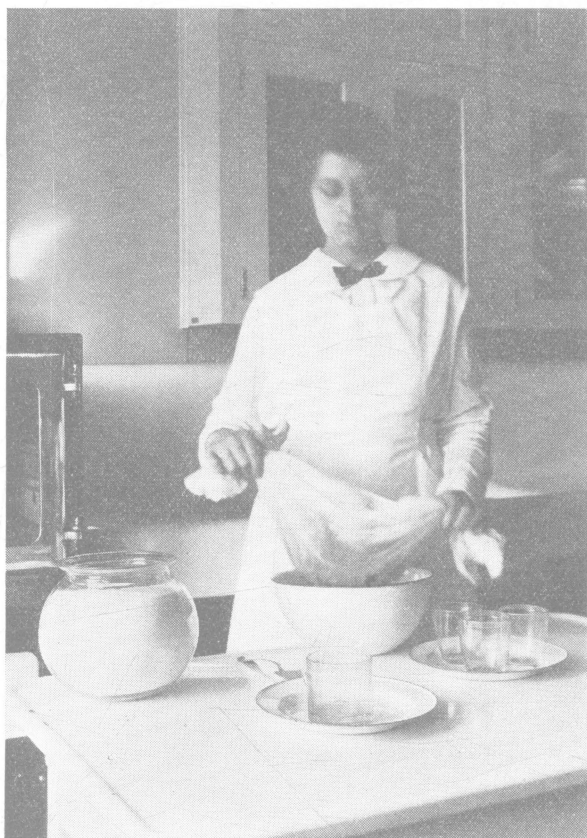


Fig. 4.—Using the cheesecloth hammock in straining fruit juice

by alternately raising one end and then the other. Two or three extractions of juice may be made from the same fruit by adding water and cooking the pulp a second and a third time. The jelly bag or cheesecloth may be squeezed in making the last extraction. The different extractions should be combined so as to produce a uniform lot of jelly.

To make a second extraction from hard fruits, add an equal weight of water to the pulp. In making a second extraction from

soft fruits use double the amount of water used for the first extraction. After adding the water boil the mixture gently for five minutes. Remove it from the fire, let it stand 10 minutes and strain out the juice. With some fruits, such as currants and blueberries, a third extraction may be made, using the same proportion of water to pulp as in making the second extraction.

Pulp left after extracting part or all of the juice for jelly may be used for fruit butter, but if to be used for this purpose it is usually not desirable to extract all of the juice. See the directions on page 25 for making Fruit Butter.

Proportion of Sugar

Measure the extracted juice so that the amount of sugar needed may be estimated. A large percentage of the failures in jelly making is due to an over proportion of sugar to juice. Sugar is used in jelly making: (1) to combine with acids and pectin, causing the juice to jelly; (2) to improve the texture when used in moderate amounts; and (3) to adapt acid flavor to taste.

The amount of sugar to be added depends upon the acidity of the juice. The most satisfactory results are obtained when the weight of the sugar is one-half to three-fourths that of the juice measured after extraction is complete and before the juice is concentrated. More sugar obscures the true fruit flavor and increases the cost of the product. The smaller amount of sugar produces a jelly rich in fruit flavor and of better texture.

Concentration of Juice

Better results are obtained when a small amount of jelly is made at one time. Place not more than three or four quarts of extracted juice in a kettle large enough to permit the juice to boil rapidly. Boil the juice to concentrate it. The juice from hard fruits should be reduced to about one-half its original volume, and from soft fruits to about one-third.

Addition of Sugar

To the concentrated juice add the estimated amount of sugar, stir until it is dissolved, and boil the juice rapidly until the jelly test is secured. Rapid cooking insures a clear, bright product. Slow cooking results in a dark, sirupy mass.

Jelly Test

The most reliable test for jelly is the spoon or drop test made as follows: lift a spoonful of the juice and, pouring it back into the kettle, observe the manner in which the last few drops leave the spoon. When these form two distinct drops, the juice is nearing

the jelling point and requires more careful attention and frequent testing. When instead of drops a sheet of $\frac{1}{2}$ inch or more in length forms on the edge of the spoon, and breaking loose at one end shears itself off, the jelly is finished. Remove immediately from the fire.

Filling the Glasses

Immediately upon removal from the fire pour the jelly thru a double layer of cheesecloth into a hot pitcher or vessel of suitable size. Then quickly pour the hot jelly into clean, hot glasses to within $\frac{1}{4}$ inch of the top. This leaves ample space for the paraffin, and overcomes the tendency for the jelly to "weep" or overflow.

Covering the Glasses

When the jelly is cold and has set, cover it with hot paraffin which has been melted and heated to the boiling point. A better seal results if, before covering with paraffin, the jelly is separated from the side of the glass by the use of a blunt knife point to a depth of one-eighth of an inch.

Cover the glasses of jelly to prevent evaporation and the entrance of molds and yeasts. Tin lids or coverings made from clean paper may be used.

Labeling and Storing

Wipe the glasses with a cloth wrung out of hot water. Place a small, neatly printed label on a convenient place on the lid or glass.

Store the jelly in a cool, dry place. Warm, damp places encourage the growth of yeasts and molds.

Special Directions for Making Jelly

Grape Jelly

Grapes for making jelly should be barely ripe or under-ripe. If one must use grapes that are quite ripe it is wise to add some that are under-ripe. Remove the grapes from the stems, and weigh them. Wash them thoro, place them in a preserving kettle, and add water equal to one-half the weight of the grapes. Boil them until the skins slip freely from the pulp. From this point follow the General Directions for Making Jelly, page 21. There is less likelihood of crystals forming in grape jelly if the juice is heated to the boiling point, sealed in sterile jars or bottles, and set aside for a few weeks, allowing the crystals to settle. When ready to make jelly, pour off juice, leaving the crystals in the jar.

Currant Jelly

Remove all leaves and decayed berries. Weigh the fruit and wash it thoroly. Place it in a kettle and add water equal to one-

fourth the weight of the fruit. Cook the fruit rapidly until it is tender. From this point follow the General Directions for Making Jelly, page 21, making two or three extractions as desired.

Apple Jelly

Wash the apples, remove all decayed spots and worm holes. Cut the apples in thin uniform slices. Place the slices in a kettle and add an equal weight of water. This amount may be approximated by adding water until the fruit just floats from the bottom of the kettle. Follow the General Directions for Making Jelly, page 21. Use only one-fourth to one-half as much sugar as juice measured before it is concentrated.

Blackberry Jelly

It is difficult and often impossible to make blackberry jelly of good texture, but by the addition of juice of some other fruit, such as apple, it is possible to produce a jelly of excellent quality with a distinct blackberry flavor. Remove the stems and decayed berries. Weigh and wash the fruit. Follow the General Directions for Making Jelly, page 21, using one-half measure of apple juice for every measure of blackberry juice, and in concentrating the juice reduce it to one-half its original volume.

Fruit Juices

Fruit juices have two distinct uses in the home, and the methods of handling them differ according to their use. Those intended for culinary purposes may be extracted in the same way as for making jelly. If desired they may be concentrated by boiling before being canned or they may be canned or bottled immediately after they are extracted. They may be processed according to the directions for canning fruits. Do not boil fruit juices intended for beverages as boiling tends to destroy their delicate flavor. Extract the juice by adding a little water to the fruit and cooking it at a temperature of 170° F. to 180° F., or until the fruit is soft. Strain and place it in bottles or jars. If bottles are used leave them open, if jars are used partially seal them. Set the bottles or jars in a vessel of water, having it come almost to the top of the containers. Heat the water to 170° F. and keep it at this temperature for 45 minutes. Seal the jars with good corks that have been dipped in boiling paraffin. Push the corks firmly in place. Sugar may be added before bottling the juice or when it is served, but should be used sparingly.

Fruit Butters

Fruit butters are an excellent substitute for the rich jellies and preserves so commonly used. Such fruits as peaches, apples,

plums, and grapes are used for making fruit butters. The fruit is cooked and put thru a colander or sieve to remove the seeds and skins. Only enough sugar is used to make a palatable product. Pulp left after extracting part or all of the juice for jelly may be used for fruit butter, but this usually requires the addition of other fruit and of spice to improve the flavor.

Apple Butter

To 1 peck of ripe cooking apples, allow 1 gallon of cider if available and from 1 to 1½ pounds of sugar or less as desired. Wash the apples, remove all bad spots, and cut the fruit into quarters or slices. Place the pieces of fruit in a porcelain or aluminum kettle, and add from 3 to 4 quarts of the sweet cider. Cider is not essential, but adds to the flavor and quality of the product. If cider is not available, add enough water to start the cooking. Heat to the boiling point and boil until the fruit is reduced to a pulp. Pour the cooked fruit into a sieve or colander, and, using a cup or fruit jar, force the pulp thru. Return the pulp to the cooking vessel and cook, stirring constantly until the mass begins to thicken. This is shown by the sputtering of the boiling product. Add the sugar. If cider is not used the amount of sugar may be increased by ½ pound. If a tart butter to be used as a relish is desired, omit part or all of the sugar. Continue the cooking until the desired consistency is obtained. This requires from 1 to 2 hours. If a spiced product is desired add 3 teaspoons of ground cinnamon and 1 teaspoon of ground cloves just before removing the apple butter from the fire. Pour the boiling hot apple butter into clean, hot, glass jars and seal them immediately. About 4 quarts of the finished product should be obtained from this recipe.

Grape Butter

Grape butter is most economically made as a by-product of grape juice; if made in this way there is less likelihood of having crystals form in the butter. To 10 pounds of grapes allow 1 pint of water and from 1 to 2 pounds of sugar (or less). If a tart butter is desired, omit the sugar. Stem the grapes and wash them thoroly. Add the water and cook the grapes below the simmering point until the fruit is soft. If a thermometer is at hand, cook the fruit at a temperature of from 170° F. to 180° F. Pour the fruit into a colander or sieve and allow the juice to drain off. This juice may be bottled as directed for bottling Fruit Juices and used later for grape juice or jelly. Return the grapes to the kettle and cook them until they are soft. Press them thru a sieve, weigh the pulp, and return it to the kettle. If desired, add one-third as much apple

pulp as grape pulp. This may be done to reduce expense, if apples are cheaper than grapes, or to improve the flavor. Cook at the boiling point for from 5 to 10 minutes. Add an amount of sugar equal to one-third of the weight of the pulp or less, and cook until of the desired consistency. If spices are desired add them just before removing the butter from the fire. Pour the boiling hot grape butter into clean, hot glass jars and seal them immediately.

Jams

Whole small fruits such as blackberries, raspberries, and strawberries are used for making jams. The fruit is heated slowly to the boiling point and cooked without the addition of water. Liquid is supplied by crushing part or all of the fruit. It is necessary to use great care to prevent scorching. When the mixture begins to thicken sugar may be added. One-half to two-thirds as much sugar as fresh fruit by weight is a better proportion than was called for in the old rule of "pound for pound." Jams should not be too thick to spread easily, and not thin enough to run. When a spoon dipped into the boiling mass is lifted out and remains heaping full, the jam is done. As the product will be thicker when it cools, care should be taken not to overcook it. If desired, spices may be added just before removing the jam from the fire. Jam made with this proportion of sugar must be sealed to prevent spoilage.

Blackberry Jam

Weigh the berries and wash them thoroly. Place them in a preserving kettle and crush some or all of the fruit. The addition of $\frac{1}{4}$ -pound of apple pulp to each pound of berries reduces the cost and improves the texture and flavor of the product. Heat the fruit slowly until the juice flows freely, then boil rapidly, stirring to prevent scorching. When the boiling mass starts to thicken add an amount of sugar equal to one-half the weight of the fresh fruit and apple pulp if used. Continue to cook until of the desired consistency for jam. Pour into hot, sterile, dry, glass jars and seal at once. Store in a cool, dry place.

Raspberry Jam

Excellent jams may be made from all types of raspberries, but the black and purple varieties have the best flavor. Because of the size and number of the seeds in the black varieties it may be desirable to press the pulp thru a colander or sieve. The addition of one-third as much apple pulp as raspberry pulp adds body to the jam and makes possible a product with fewer seeds and no appreciable loss of quality or flavor. The general method of procedure is the same as that given for blackberry jam.

Strawberry Jam

Strawberry jam is most economically made from the culls and soft or slightly over-ripe fruit. Remove the hulls. Weigh the fruit, wash it thoroly, and place it in a preserving kettle. Crush part or all of the berries. Heat to the boiling point and cool rapidly until the mass begins to thicken, stirring to prevent scorching. Add an amount of sugar equal to about one-half the weight of the fresh fruit. This proportion may be varied according to the acidity of the berries. Continue to boil the jam until of the desired consistency, stirring to prevent scorching. Pour the boiling hot jam into clean, hot, dry, glass jars and seal at once.

Time Table for Blanching and Processing (Minutes)

PRODUCTS	Blanching or Scalding	Processing			
		Water Bath	Water Seal	Ten-pound steam pressure	Fifteen-pound steam pressure
VEGETABLES:					
Asparagus.....	2-3	120	90	60	40
Beets.....	5	90	80	60	40
Carrots.....	5	90	80	60	40
Corn.....	5-10	180	120	90	60
Greens.....	15`	120	90	60	40
Lima Beans.....	5-10	180	120	90	60
Peas.....	5-10	180	120	90	60
Pumpkin.....	3	120	90	60	40
String Beans....	5-10	120	90	60	40
Squash.....	3	120	90	60	40
Tomatoes.....	1-2	22	18	15	10
FRUITS:					
Apples.....	1-2	20	15	10	..
Berries.....	...	16	12	8	..
Cherries.....	...	16	12	8	..
Currants.....	...	16	12	8	..
Gooseberries....	1-2	16	12	8	..
Pears.....	1-2	20	15	10	..
Peaches.....	1-2	16	12	8	..
Plums.....	1-2	16	12	8	..
Pineapple.....	...	30	15	12	..
Quince.....	1-2	20	15	10	..
Strawberries....	...	16	12	8	..
MEATS:					
Meats (Uncooked)...	...	210	210	90	90
Meats (Partially cooked).....	...	180	180	90	60
Fish.....	...	180	180	90	90

* In steam.