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HOME CANNING



Can a variety of fruits and vegetables.

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Circular No. 314*

HOME CANNING

By FLORENCE IMLAY and PEARL J. HAAK

WHY CAN

Canned fruits and vegetables give variety to the winter diet and make menus interesting and attractive. It is wise to have well-filled shelves of canned foods from which to choose. The wisdom and economy of producing sufficient fruits and vegetables for an adequate supply during the growing season has never been doubted. It is equally good wisdom and economy to produce a surplus for canning which will supply the family needs during the winter season.

Knowledge of nutrition has taught us that continued health, resistance to infection, vitality, energy, happiness and efficiency depend to a large extent upon an adequate diet for the entire year and that, to be well fed, each person should have at least two liberal servings of both fruits and vegetables every day, exclusive of potatoes, dried beans, peas, jams, jellies and preserves.

Vegetables are good sources of minerals, especially iron which is a necessary element to build good red blood. The roughage of vegetables and the acids of fruits aid in regulating the elimination of waste products from the body. Both vegetables and fruits contain vitamins which are essential to proper growth, resistance to infection, and maintenance of health. The minerals and vitamins of properly canned fruits and vegetables compare favorably with those of the cooked fresh foods. During the winter the best substitutes for fresh fruits and vegetables are stored, canned or frozen ones. A liberal use of canned fruits and vegetables does much to assure good health during the winter.

SPOILAGE OF FOOD

Certain chemical changes take place in maturing fruits and vegetables which are known as ripening. If these processes continue after fruits and vegetables have reached their prime, deterioration

* To supersede Circular 220.

starts soon and makes the products more susceptible to the action of bacteria, yeasts and molds which finally cause spoilage. These tiny organisms must have food, moisture and warmth to multiply. Low temperature checks the growth and development of microorganisms but high temperature destroys them. The spoilage of food may be prevented by:

(1) Making conditions unsuitable for the further action of microorganisms or

(2) Destroying the organisms already on the product and sealing it in an air-tight container.

Prevention of Spoilage. The three common methods used in the home to preserve fruits and vegetables are: (1) drying, (2) use of preservatives and, (3) canning. In the drying process, sufficient moisture is removed from vegetables and fruits to prevent bacteria, yeast or mold from causing changes in the product which eventually result in spoilage.

In brined vegetables or fruits, pickles, jams, jellies or preserves, sugar, salt or vinegar retards the growth of bacteria, yeasts and molds.

The high temperature used in canning destroys the microorganisms on the product and sealing in an air-tight container prevents the entrance of more organisms. If spores are not destroyed and the jars or cans are kept in a warm room, the spores may develop and cause spoilage.*

TYPES OF SPOILAGE

Fermentation. When certain microorganisms grow in canned products they produce acid or gas or both. If acid is produced the food becomes sour. When gas is produced sufficient pressure may be generated to break glass jars or bulge the ends of tin cans.

Flat Sour. Certain bacteria produce an acid without the formation of gas. Some of these bacteria grow well at temperatures between 130 and 140 degrees F. and often cause spoilage in products not quickly cooled after having been processed. Others cause spoil-

* Mold and yeast plants are destroyed easily at temperatures below boiling for varying periods of time or for a few minutes at 212 degrees F. Bacteria are easily destroyed at boiling temperature when they are growing actively, but many types of bacteria go thru a dormant or spore stage in their life cycle. It requires a long period of processing at boiling point to kill spores or a very high temperature which only can be attained when using a pressure cooker.

age in products stored in a warm room. Flat sour spoilage is particularly apt to occur in corn, greens, peas and string beans.

Putrefaction. The growth of the bacteria which cause putrefactive change in food is evidenced by gas, bad odor, softening and darkening of the product. This type of spoilage often occurs in peas and corn.

Botulinus Spoilage. The growth of undestroyed spores of botulinus bacteria produces a toxin that is very poisonous. This type of spore has a high resistance to heat except in acid foods. Cases have been recorded when it took 6 to 10 hours to destroy all spores at boiling temperature. For this reason, the pressure cooker is recommended for canning non-acid vegetables. Non-acid vegetables, such as corn, peas, beans and greens, are more apt to contain botulinus than tomatoes and fruits.

Detection of Spoilage. Spoilage may be detected in an unopened container by:

1. Bulged or swelled ends of tin cans.
2. Broken seal on glass jar.
3. Perforations in metal covers or tin cans.
4. Liquid escaping between rubber and jar.
5. Unusual cloudiness of liquid.

Spoilage may be detected when a container is opened by:

1. Liquid spurting out or air rushing out. (Do not confuse this with air sucked in, which indicates a good seal.)
2. Disagreeable odor or one not characteristic of the food.
3. Extremely soft food.
4. Extreme change in color.
5. Extensively darkened or badly corroded can.

Danger in Eating Spoiled Food. Usually a careful observer can tell when bacteria have caused spoilage of canned food. Carelessness in the detection of spoilage may result in serious illness or even death to those eating food contaminated by botulinus bacteria.

Precautions. Boil all commercially or home-canned vegetables except tomatoes for five minutes before tasting or eating. Heating sometimes brings out odors difficult to detect in cold food. Food which is to be served for salad may be boiled and chilled before using.

All canned foods showing any signs of spoilage should be destroyed by burning. Sterilize all jars, at once, that have contained spoiled food by:

1. Washing thoroly in clean, soapy water.
2. Boiling in a solution made by adding three tablespoonfuls of washing soda to one quart of hot water.
3. Boiling in clear water.
4. Rewashing and rinsing in hot water.

This special care is necessary to prevent the contamination of new food placed in these containers.



Small equipment for canning.

CANNING EQUIPMENT

Canning equipment includes utensils for the preparation of foods for canning, vessels for pre-cooking, canner for processing and containers such as tin cans or jars, lids and rubbers. The following small equipment makes home canning easier:

1. Colander.
2. Sieves.
3. Sharp knives.
4. Accurate measuring cups.
5. Accurate measuring spoons.
6. Large wooden spoon.

7. Wide-mouthed funnel for filling jars.
8. Jar lifters or holders.
9. Paddles or wooden spatulas to aid in packing containers.
10. Hand sealer if tin cans are used.
11. Lifter for hot pan.
12. New, tested rubbers.
13. New lids for jars having metal tops.
14. Device for tightening and loosening lids.
15. Good jars.

TYPES OF CANNERS AND HOW TO USE THEM

Steam Pressure Canner. Steam-pressure canning is recommended by the Bureau of Home Economics, Department of Agriculture, as the safest method for canning all vegetables. The canner consists of a heavy aluminum or steel vessel with a heavy, close-fitted lid which is fastened down by clamps. On the top of the lid of every type of cooker are a pressure gage to indicate the pressure and corresponding temperature, a petcock for the escape of air, and a safety valve to prevent pressure becoming too high. Since the steam is confined under pressure in this type of canner, the temperature of the canner varies with pressure from 212 degrees F. when the water in the canner begins to boil and pressure gage registers 0, to 240 degrees F., when the gage registers 10 pounds.

How to Use the Pressure Cooker. Cover the rack in the bottom of the pressure cooker with water and bring to boiling point. When the water boils, place jars on the rack and adjust the lid on the cooker. Partially tighten the clamps opposite each other and then screw them all down tightly. This makes the lid fit evenly.

Place over hot fire to run pressure up quickly.

Leave petcock open until the steam has driven all air from canner and the steam has flowed freely from the petcock seven minutes. After petcock has been closed watch the pressure gage until desired pressure is reached and then begin counting time. When steam is not permitted to escape, the temperature can be raised much higher than the boiling point. The length of time for processing varies with the nature of the product and size of the container but is less than that for the water-bath canner. Steam

should not escape from around lid safety valve nor from petcock during the period of processing.

The pressure should not be run higher than the time table indicates and it should not fluctuate. Too high a pressure (temperature) softens the product, while changing temperature may force the liquid out of the jars. When the desired pressure has been reached, move the canner away from the hottest part of stove or regulate the flame so that the pressure remains constant.

For glass jars and No. 3 tin cans, when time of processing is up, remove cooker from stove and let stand for a minute or so after gage hand indicates zero. Then open the petcock, undo bolts, remove jars and finish sealing partially sealed jars.

If canning directions are not followed carefully liquid in jars may be very low when the processing period is finished. This does not interfere with the keeping qualities of the canned food but makes the jar look less attractive.

When canning in No. 2 tin cans, open the petcock immediately when the processing period is completed. There is no liability of losing liquid from tin cans. Plunge all cans at once into cold water and change water frequently as it warms. If air bubbles rise thru the water, remove contents from the faulty can, repack in another can and process at least ten percent of the entire time suggested.

Temperatures obtained at different pressures are:

5 pounds.....	228 degrees F.
10 pounds.....	240 degrees F.
15 pounds.....	250 degrees F.
20 pounds.....	259 degrees F.

Altho the initial cost of pressure cookers is high, they are economical because they save fuel, energy and time, and because foods processed in them are less apt to spoil than those processed by other methods.

The approximate number of containers which can be processed in different sized pressure cookers:

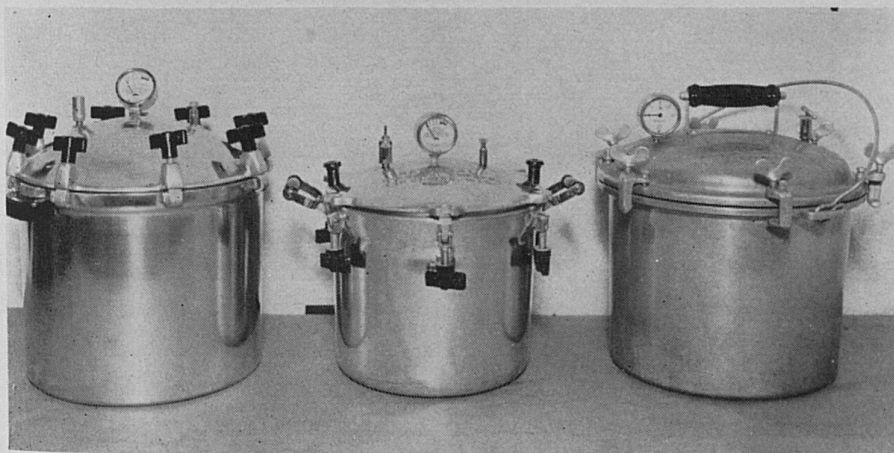
SIZE OF COOKER	PINT GLASS JARS	QUART GLASS JARS	NO. 2 TIN CANS	NO. 3 TIN CANS
12 qts. (liquid capacity)	7	4	8 to 10	5
18 qts. (liquid capacity)	8 to 10	5 to 7	14 to 16	8 to 10
25 qts. (liquid capacity)	18	7	20 to 21	10
40 qts. (liquid capacity)	24	16	36	21 to 24

Unless a housewife has several persons to help her prepare products for processing and a man to lift the cooker from the stove she should not consider purchasing one of the large canners.

The purchase of a pressure canner should be the goal of every family that cans vegetables.

Care of Pressure Cookers. Care should be given a pressure cooker if the greatest service is to be obtained from it; therefore

- a. Handle carefully to prevent nicks, dents and deep scratches on the edge of the kettle or cover.
- b. Avoid knocking the petcock, safety valve or gage, on the cover.
- c. Wash the cover with a cloth to avoid immersing gage in water.
- d. Wipe and clean small metal ball in the safety valve after using, to prevent rusting or corroding.
- e. Leave spring in safety valve released when cooker is not in use.
- f. Wash carefully and dry the cooker and cover thoroly after each using.
- g. Leave the cover unfastened when not in use.
- h. Wrap gage in cotton and tie a heavy piece of cardboard firmly around it, when carrying in a car or shipping.



Steam pressure cookers.

Water Bath. Water-bath canners may be purchased or assembled from home equipment, such as pails, large buckets, lard cans and wash boilers. The vessel should be deep enough to allow for

a rack in the bottom, two inches of water to cover the jars and still have several inches of space above the water. The canner must have a well-fitting lid to confine the steam and prevent water from boiling away. A rack or false bottom raised one inch from the bottom of the canner allows free circulation of water under the jars, prevents breakage and lessens likelihood of the loss of liquid from the jars. A rack may be made either of strong one-half inch wire netting fastened on a wooden frame, or wooden strips nailed together securely. A flat piece of iron fastened to the bottom of the wooden rack helps to keep it on the bottom of the canner. Handles attached to the rack are convenient for lowering and removing jars from boiling water. Since the temperature of the water-bath canner never goes above boiling (212 degrees F.) this type of canner is best suited for foods that keep well, such as fruits and tomatoes.

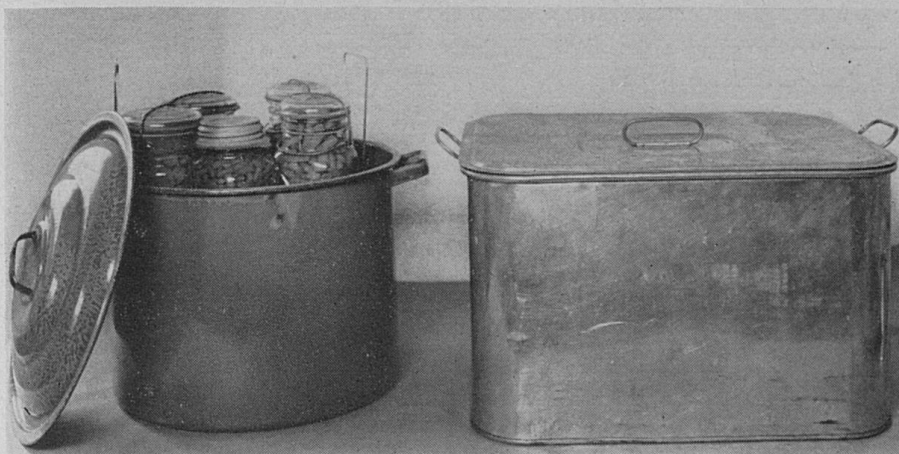
How to Use Water-Bath Canner. When the water in the canner is boiling with large bubbles bursting on the surface, place the jars or cans on the rack with sufficient space between them to allow the water to circulate freely. Altho the containers will be hot from the precooked food, the temperature of the water in the canner will be somewhat lowered and the counting time for processing should not be started until the temperature has returned to boiling point. Cover the canner with a close-fitting lid and add boiling water if necessary to keep containers well covered. Remove jars from the canner as soon as full time for processing is up, to prevent over-cooking. Completely seal jars immediately.

Since the temperature of the water-bath canner never goes above boiling point (212 degrees F.) and since some types of spores found on non-acid vegetables may not be destroyed at that temperature there is a risk in processing non-acid vegetables in the water bath. The housewife who uses this method should realize that there is danger if all spores are not destroyed, and use every precaution in the preparation and canning of non-acid vegetables. The following precautions should always be used:

1. Have equipment such as pans, dish cloths, jars, etc., thoroly clean.
2. Wash vegetables carefully.
3. Prepare vegetables as soon as possible after they have been gath-

ered, bring quickly to boiling point, and pack into hot, sterilized jars. *One hour from garden to can is an excellent rule.*

4. Immerse the hot jars in the water which has been brought to boiling point in the water-bath canner.
5. Allow the water to cover the jars at least two inches.
6. Start counting time when the water has reached a rolling boil.
7. Keep the water boiling the entire time necessary to process the vegetable.
8. Be sure to process the product as long as is indicated in the directions.
9. Remove the jars from the water bath as soon as the processing time is up.



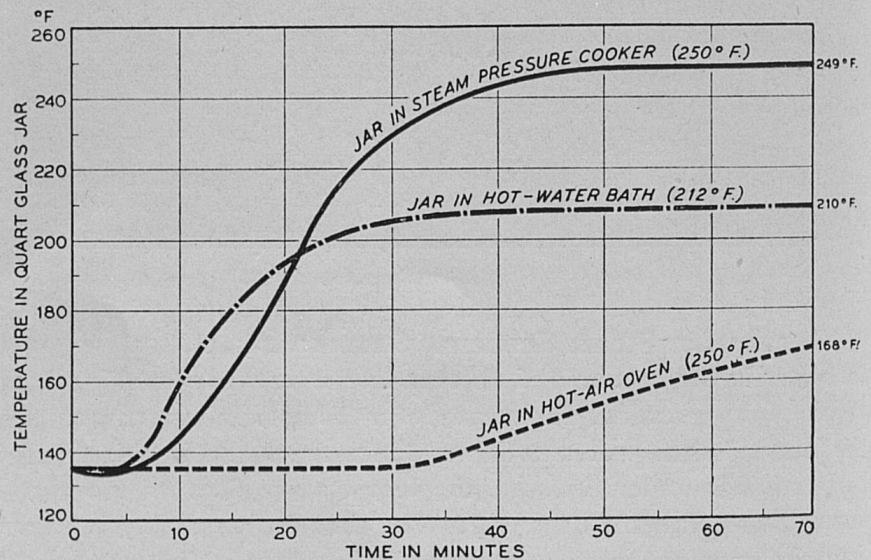
Two water-bath canners.

Steamers or Steam Canners. Steam canners with a container for water in the bottom and an oven-like chamber to hold jars may be used for processing. The steam from the boiling water surrounds the jars and thus processes them. Since the steam in this type of canner is not under pressure, the temperature does not go above the boiling point, 212 degrees F. The time for processing is, therefore, the same as that for the water-bath canner. The water must boil vigorously during the whole processing period and be replenished frequently thru a small pipe projecting from the top of the canner.

Open Kettle. When fruits or tomatoes are cooked in the open kettle, the housewife may use any kind of container which she has, except chipped enamel or tin pans. When the open-kettle method is used for canning, sterilized jars must be filled quickly and the sterilized covers placed on the jars immediately to help prevent growth of mold.

Many housewives prefer to hold soft fruit at simmering point until thoroly heated, and hard fruits at this temperature until they are tender, because the product has a more natural flavor than when cooked at boiling point. However, if fruits canned by the open kettle are cooked at simmering point (180 degrees F.) the jars must be processed in a hot water bath for five minutes to be sure that mold and yeasts are destroyed.

Oven. Processing may be done in the oven if a thermometer is used to be sure that the correct temperature of 250 to 275 degrees F. is maintained. Place the hot jars, partially sealed, on the rack of the oven about two inches apart to allow heat circulation. The oven may be filled to capacity. All jars canned by this method



Temperature in quart glass jars of peas processed by three different methods. "The contents at the center of the jar reached 249 degrees F. after 70 minutes in the steam pressure cooker, in which the temperature was 250 degrees. In the hot-water bath held at 212 degrees F., the temperature reached only 210 degrees in this time. In a hot-air oven held at 250 degrees F. only 168 degrees was reached." (Used by courtesy of the University of Illinois.)

should be *partially, not completely*, sealed, regardless of the temperature at which the product was packed. This precaution is necessary because of the high temperature of the oven and consequent possibility of explosion of completely sealed jars. (See time table for canning.) A direct, cold draft should not be allowed to strike jars when the oven door is opened.

CONTAINERS FOR CANNING

Both glass jars and tin cans are suitable for canning fruits and vegetables. Glass jars are manufactured in both green and clear glass and in different sizes and shapes. Green glass is cheaper than clear glass but the true color of the food cannot be seen thru it. For this reason, the use of green glass is not encouraged for exhibits. Large-mouthed jars are convenient for packing whole tomatoes and fruits canned in large pieces.

The Mason Jar has a screw top or lid. Inside the lid is a porcelain or enamel lining to prevent food coming in contact with the metal. If the porcelain cracks, discard the lid.

The top of a mason jar must fit perfectly. Carelessness in opening jars may bring trouble the next canning season. A simple way to open a jar is to pull the rubber ring out with a pair of pliers. If the rubber is hard it may be softened by plunging the jar upside down in hot water. A sharp-pointed instrument used in opening a jar may bend or break the metal lid so it will not seal perfectly when used again.

Glass-top Jars. The wire-clamp glass-top jars are very satisfactory, as they can be easily cleaned and opened. If the bail becomes loose and does not click when slipped over the top, it may be removed and bent back into proper shape.

Automatic Seal. The two-piece self-sealing or vacuum-sealing type of jar requires no rubber but new tops must be purchased each year. The band may be removed from the jar after it is cooled and be used over and over again. Under the lacquered metal top around the outer edge is a firm, waxlike compound which softens when heated and forms a seal on cooling. When the food is packed into the jar hot, it may be completely sealed before processing in a steam pressure canner or water bath. Do not tighten after it is

removed from the canner. Care should be taken in purchasing this type of jar that the waxline compound is FIRM, SMOOTH AND CONTAINS NO CRACKS. It is recommended that the carton be opened and the jars examined before they are taken from the store. It is important that jars of this type be kept in a cool place before using.



Types of glass jars.

Tin Cans. The sanitary or rim-seal type of tin can is rapidly replacing the cap-and-hole type which requires exhausting and soldering. When food is packed hot into the rim-seal can and the can sealed immediately, no exhaust is necessary. A compound or rubber composition film inside the lid makes a complete seal when the cover is crimped with a commercial sealer. Several types of sealers are on the market, which can be adjusted to fit either number 2 (pint) or number 3 (quart) cans. These sealers may also be used for opening and reflanging cans so that they may be used again.

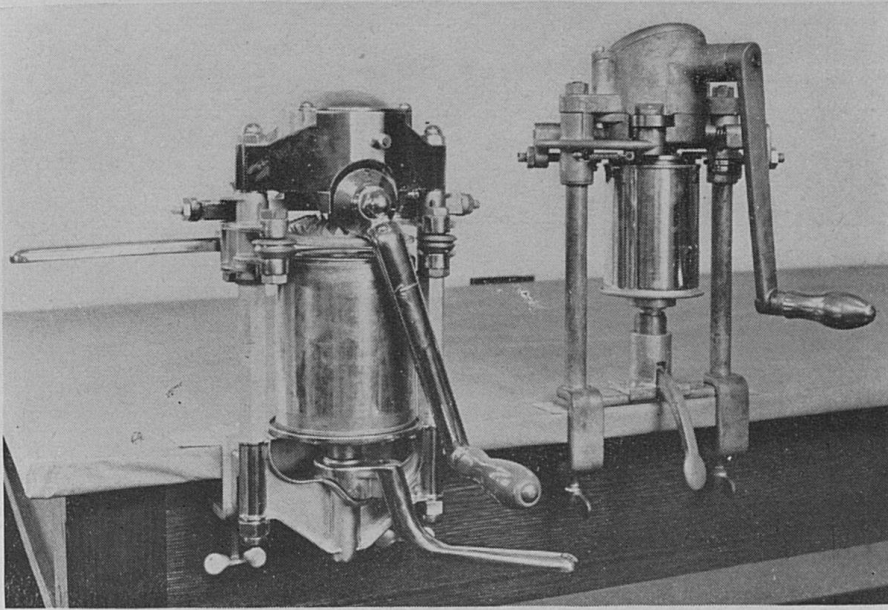
Many fruits and vegetables fade or change color when canned in plain tin cans. Red fruits and vegetables fade when heated in plain tin cans, while corn, beans (except very young, tender string beans) and peas become darkened, and squash and pumpkin cause plain cans to corrode. The use of enamel-lined cans prevents the fading or discoloration of food in tin. Sanitary or R-enamel cans which have a deep gold color with a bright finish are used for red

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fruits and vegetables, plums, squash and pumpkin. C-enamel-lined cans which have a light-gold color with a dull finish are used for the sulfur-bearing products, such as corn, hominy, beans and peas. The following table shows the type of can which should be used for the various products.*



Two types of tin can sealers.

PLAIN CANS	C-ENAMEL CANS	R-ENAMEL CANS
Apples	Butter beans	Blackberries
Apricots	Kidney beans	Dewberries
Peaches	Over-mature string beans	Raspberries
Pineapple	Corn	Strawberries
Asparagus	Hominy	Cherries
Young tender string beans	Peas	Cranberries
Carrots	Soup mixture	Grapes
Greens	Succotash	Beets
Okra		Pimientos
		Pumpkin
		Squash

The advantages of canning in tin are: (1) no liability of breakage; (2) the petcock of the pressure cooker may be opened when

* Acid foods should never be canned in C-enamel cans as the acid may cause the enamel to peel off. Pickles should always be put up in glass.

using number 2 cans as soon as processing time is over; (3) no loss of liquid; (4) cans may be plunged into cold water immediately after processing, which prevents overcooking the product; (5) time for processing is slightly shorter for tin cans than for glass jars because tin is a better conductor of heat than glass.



Sanitary tin cans.

RUBBERS

Buy the best quality of rubber rings and use them only once for fruits and vegetables because rubber deteriorates with age and becomes porous. Old, porous or hard rubbers do not make a perfect seal and the canned product is apt to spoil. Rubbers kept from one year to the next by merchants are apt to deteriorate as much as those kept by the housewife. Both mason and glass-top jars are made to effect a complete seal with just one rubber. Never use two rubbers on a jar of canned fruit or vegetables.

Tests for Rubbers —

1. When the rubber is bent sharply back on itself there should be no signs of cracking or breaking.
2. Rubber rings should stretch about twice their length and return almost immediately to their original size and retain their elasticity.
3. When crumpled in the hand, a rubber should bounce into its original shape as soon as released.

PREPARATION OF EQUIPMENT FOR CANNING

It is a good plan for the housewife to examine her equipment and put it in good order a day or two before she expects to can. She should have a liberal supply of new, tested rubbers. All jars and lids should be tested and fitted. The usual method of testing a jar is to fill it partially with water, adjust a rubber, fasten the lid tight and invert. If the jar leaks, try another lid. All defective lids and jars should be discarded to avoid future trouble. To regulate loose bails of glass-top jars, remove the bails and tighten by bending them to fit. Special care must be taken that all jars from which spoiled food has been removed are thoroly sterilized.



Winning jars in state canning contest, 1937.

Jars, cans, tops for glass jars and small equipment used for packing jars which are to be used in canning should be thoroly washed in clean hot suds, rinsed, immersed in hot water or inserted upside down in a small amount of hot water, brought to a boil and kept hot until time for packing. Tops for tin cans should be sterilized by dry heat in the oven.

SELECTION OF THE PRODUCT

Foods are most satisfactory for canning when each crop is in its prime. Immature fruits and vegetables lack flavor and shrink much more during the process of canning than well-matured products. On the other hand, most vegetables become tough or stringy in texture and strong in flavor after they pass the period of maturity. Wilted, decayed or defective foods contain bacteria which are difficult to destroy and are apt to cause spoilage. "One hour from garden to can" is an excellent slogan for the canning of non-acid vegetables. When fruits and tomatoes must be picked the day before they are to be canned they should be stored in shallow, clean containers in a cool place.

CLEANING AND GRADING

All fruits and vegetables to be canned should be cleaned very carefully. Low-growing vegetables such as greens, string beans and asparagus, need particular care in cleaning because they are apt to carry heat-resisting bacteria which are found in the soil. Do not wash too many vegetables at one time, and use plenty of water. Lift the vegetables out of the wash-water rather than pour off the water. A large colander or wire basket lessens the labor.

Grade food for firmness, uniformity of size, and ripeness, and can foods of about the same size and ripeness together. Foods which are not to be canned whole should be cut in uniform sizes convenient for packing and serving.

It is a convenience for the housewife to have her canned products labeled to correspond with her grades, particularly when canning in tin. A wax crayon may be used to label hot cans.

METHODS OF CANNING

Hot Pack. The hot-pack method has been found to be the most satisfactory one for canning vegetables and fruits. Other methods can be used successfully for tomatoes. In the hot-pack method the vegetable is placed in boiling water, brought quickly to the boiling point and held there for the short specified period of time. This process is called precooking. (See time table for canning for the length of time to precook different vegetables.) A similar method

may be used for fruit except that the syrup is kept at simmering point instead of boiling. This treatment shrinks the product and drives the air out of the air cells. The precooked vegetables and fruits are packed quickly into hot jars or tin cans, the jars filled with boiling liquid in which the products were precooked. If the vegetables and fruits prepared in this way are to be processed in a hot water bath, the jars are completely sealed before processing, but if they are to be processed in a pressure cooker or oven, the jars are partially sealed before processing. Tin cans may be sealed before processing in any type of canner.

Vegetables canned by the hot-pack method do not shrink so much during sterilization as those canned by the cold-pack method. There is also less danger of spoilage since they are heated before packing.

In regard to the use of commercial preservatives, the Bureau of Home Economics, United States Department of Agriculture, has made the following statement: "The use of chemical preservatives, such as salicylic acid, sodium benzoate, and 'canning powders,' should be avoided in home-canning any kind of food. These chemicals vary in their effects on the human body, some being more harmful than others. Therefore the safe way for the home canner is to process foods adequately with heat and not to use chemical preservatives."

Cold Pack. The cold-pack method may be used in canning fruits and tomatoes. The small, soft fruits such as berries and cherries may be packed into the jars cold, covered with boiling syrup and partially sealed. Peaches and tomatoes may be peeled by dipping into boiling water until the skins slip off easily. The blanching also softens and partially shrinks the products, thus making it possible to pack the jars to better advantage. Apples and pears may be peeled or not, according to the way in which the canned products are to be used. Apples, pears and peaches should be dropped into a medium syrup at simmering point for 5 minutes or until thoroly heated. The products should be packed into hot, sterilized jars with the rubbers in place, and covered with a boiling hot syrup of the proper consistency, sealed and processed according to directions in the time table.

Open Kettle. Most fruits and tomatoes will keep when canned by the open-kettle method. However, neither flavor nor texture is so good as when they are canned by the hot or cold-pack method. When the open-kettle method is used, the product should be cooked gently at simmering or boiling point, packed in well-sterilized jars, and sealed immediately.

SYRUPS

To make a syrup, slowly heat water and sugar together, stirring until all sugar is dissolved and let come to the boiling point. Fruit juice may be substituted for water in making syrup.

Syrup	Sugar	Water	For use with
Thin	1 c.	3 c.	Sweet fruits such as sweet apples and pineapples.
Medium	1 c.	2 c.	Apricots, apples, berries, sweet cherries, grapes, peaches, pears, plums, and strawberries.
Thick	1 c.	1 c.	Sour fruits such as sour cherries, gooseberries and rhubarb.

The syrup suggested will preserve the natural color, texture and, as far as possible, retain the natural flavor of each fruit. Canning fruits in water is not satisfactory, for fruits so canned lack richness and flavor.

Usually, one-third to one-half as much liquid as the capacity of the container is enough to fill a well-packed jar with liquid and to make a good proportion of fruit and juice.

Jars should not be sealed completely before processing, when the cold-pack method is used, since the product is not entirely shrunken nor the air exhausted.

PACKING

Jars or cans should be clean, sterile and hot, and the rubber adjusted before packing. In packing precooked food work quickly to avoid cooling. Pack jars or cans well, but not so full of solid material that it is difficult for the liquid to carry the heat to the center of the jar, and fill with hot liquid. So-called fancy packs are not practical for home use, nor are they desirable for exhibition. Ar-

ranging apples, apricots, pears or peaches in layers is recommended as this avoids breaking them and makes a fuller, neater pack.

ADJUSTING THE LIDS AND SEALING GLASS JARS

In order to know when a jar may or may not be sealed before processing, the housewife should understand the effect of heat on the volume of air and liquid. Heat causes both air and water to expand, thus increasing the volume. When cool air or liquid is confined in the jar and heated, the result is expansion which causes the breakage or "blowing up" of the container unless it is strong enough to resist the pressure of the expanding air and liquid. When boiling hot liquid is confined and heated, not above boiling (212 degrees F.), nothing happens since the liquid has already been expanded and the air driven off by the steam. If glass jars are packed with a boiling hot product which has been precooked, and are to be processed in a water bath, they may be completely sealed before processing. It is considered unsafe to seal glass jars completely before processing in a pressure cooker because of the possible difference in pressure on the inside and the outside of the jar.

If the product is allowed to cool or if it is packed below boiling temperature, complete sealing before processing might cause the jar to break because of the expansion of the liquid and air in the jar. In order to provide for this expansion of air and liquid, jars so prepared are sealed only partially before processing. In mason jars this is done by screwing the lid down firmly and then turning back just enough to prevent the seal; in wire-clamp glass-top jars, by adjusting the top bail and leaving the second bail up; in tin cans by leaving a head space to take care of expansion.

FILLING AND SEALING TIN CANS

When vegetables and fruits are canned by the hot-pack method, the cans may be completely sealed before processing. It must, however, be kept in mind that a head space of at least one-half inch must be left to allow for expansion. If products are canned by the cold-pack method, the cans must be exhausted to drive all the air out of the products and the can. Exhaust cans according to directions furnished with tin can sealer.

CARE OF CONTAINERS AFTER PROCESSING

After jars are removed from the canner, seal immediately, if the container has not been completely sealed before processing. Place jars at least two inches apart on dry cloth. Never set hot jars on marble or metal or in a draft. Allow all jars to cool, standing with top up; then they may be inverted to test for leakage. After mason jars have cooled do not attempt to screw lids tighter for this might break the seal. Place jars canned at the same time together in a cool place and observe carefully for about a week to detect signs of spoilage. Store in a cool, dry place.

STORING CANNED FOOD

Label tin cans by placing a small sticker with the name, grade of product and date canned, on the can; or write with a grease pencil, since stickers sometimes drop off. Glass jars should be marked with the date of canning. Light does not influence spoilage but it does cause the color to fade. Hot sunlight increases the temperature and may cause spoilage.

DIRECTIONS FOR CANNING FRUITS*

Apples. Select firm, sound, tart varieties. Wash, pare and core and if they must stand for any length of time, cover with water salted in proportion of 1 tablespoon of salt to 1 quart of water to prevent discoloration. Altho the flavor, color and texture are better when it is canned by the hot or cold-pack method, fruit may be canned successfully by the open-kettle method. It is a good plan to process all filled jars five minutes in a water-bath to help prevent the formation of mold on top of the fruit. Apples to be used later for baking may be washed, cut in halves or quarters, and canned without peeling.

Hot-Pack Method. Boil apples five minutes in a thin syrup to prevent shrinkage in jars. Pack boiling hot fruit in sterilized jars, cover with the medium syrup in which they were cooked, and completely seal. Process five minutes in boiling water.

Apples (baked and seasoned) may be packed into hot jars, covered with syrup, and processed five minutes in boiling water, for all sizes of containers.

* See page 12 for general directions for canning fruit by open-kettle method.

Apple sauce may be made from windfalls or green apples. Pack boiling hot, completely seal and process containers of all sizes in boiling water for five minutes.

Apricots. See directions for canning peaches.

Berries. (Except gooseberries and strawberries.) Practically the same methods of canning are used for dewberries, huckleberries, raspberries, blackberries, loganberries, blueberries, grapes and currants. Gather berries in shallow trays or baskets, discard imperfect berries and can the rest as soon as possible after gathering. Wash by placing berries in shallow colander and dipping in and out of water or pouring water over them. Use small or soft berries for juice.

Hot-pack Method. Wash berries and remove caps and stems. Place carefully in a simmering medium syrup and hold at that temperature until heated thru. Place in hot sterilized jars with rubber in place and cover with hot medium syrup. Completely seal and process in water bath for five minutes.

Cold-pack Method. Remove caps and stems. Pack the fruit in containers, shaking gently into place to assure full pack, cover with medium boiling hot syrup and partially seal. Process quart or pint jars for twenty minutes in water bath and completely seal. Process No. 2 and No. 3 tin cans (enamel lined) for fifteen minutes.

Open-kettle Method. Cook berries by boiling in medium syrup five minutes. Pack hot in jars and completely seal.

Gooseberries. Select firm, green or ripe berries, discarding spotted or broken ones. Use method suggested for berries substituting thick for medium syrup, or make sauce by adding a small quantity of water to berries and boiling until the fruit is cooked to a pulp. Add one-half cup of sugar, or more if desired, to each quart of pulp. Heat until sugar is dissolved and pack boiling hot in containers. Seal completely and process all sizes of containers in boiling water for five minutes.

Strawberries. Strawberries contain so much water that they do not make an attractive canned product; however, some kinds keep their color, flavor and texture better than others. The Redheart and Premier are particularly good berries to can. The following method is the best the authors have found.

Gather berries in shallow trays or basket and can as soon as possible after gathering. Wash by placing in a shallow colander and dipping in and out of water or pouring water over them. Remove caps and discard all soft berries. Make a little juice by crushing small and soft berries. Add one cup of sugar and two tablespoons of juice to one quart of berries, bring slowly to boiling point, cover and let stand over night. In the morning pack berries in hot jars, reheat syrup, fill the jars and process twenty minutes in a water bath.

Cherries. Cherries may be canned pitted or unpitted. If used unpitted, prick to prevent shrinkage. Pack as tight as possible in hot containers and cover with a thick syrup if they are sour or medium syrup if sweet. Juice from pitting cherries should be used in making the syrup. Process quart and pint jars twenty-five minutes in boiling water and No. 2 and No. 3 tin cans for twenty minutes.

Currants. Same as for berries.

Grapes. Same as for berries.

Peaches. Select peaches which are ripe, but not soft. Before preparing, make medium syrup, or thinner if desired, allowing one cup of syrup for each quart jar. Add one cracked peach pit to each quart of syrup, boil five minutes and strain. Immerse peaches in boiling water until skins slip easily, peel, stone and cut in halves or slice. Place in salted water (1 tablespoon of salt to 1 quart of water) to prevent discoloration.

Hot-pack Method. Place peaches carefully in kettle of syrup at simmering point and hold at that temperature until heated thru. Pack in jars at once, placing the halves in overlapping layers, concave sides down, with blossom end facing glass. Fill containers with boiling syrup, seal and process quart and pint jars for 30 minutes in water bath if fruit is firm and hard, or 20 minutes if it is ripe and tender. Process No. 2 and No. 3 tin cans for 15 minutes.

Pears. Select firm, ripe pears. Peel,* cut in halves, core and place in salted water (1 tablespoon salt to 1 quart of water) to prevent discoloration. Cook in boiling medium syrup 4 to 8 minutes according to size of fruit. This precooking makes hard varieties of

* Pears canned unpeeled are good for baking.

pears easier to pack. Pack hot in containers, concave side down. Cover with boiling hot medium syrup, completely seal and process glass containers of all sizes 20 minutes in water bath, and tin cans 15 minutes.

Pineapple. At the height of the season pineapples sometimes can be purchased so cheaply that it is economy to can them. Use sound, thoroly ripe pineapples.

Cold-pack Method. Peel, core and remove the eyes. Cut into small cubes or remove core and slice. Pack in containers and fill jars with a boiling thin syrup, partially seal and process quart and pint jars 30 minutes in water bath, and No. 2 and No. 3 tin cans for 25 minutes. Remove glass jars and completely seal.

Hot-pack Method. Prepare pineapple the same as for cold-pack method. Place pieces of fruit in a hot, thin syrup and boil for 5 minutes. Pack in hot, sterilized containers, cover with boiling syrup, completely seal and process quart and pint jars in water bath 30 minutes, and No. 2 and No. 3 tin cans for 25 minutes.

Plums. Plums for canning should be a little underripe. Wash and prick with a fork to prevent bursting.

Cold-pack Method. Pack tight without crushing and cover with a boiling medium syrup. Partially seal and process quart and pint glass jars 20 minutes in boiling water and No. 2 and No. 3 tin cans for 15 minutes. Remove from canner and completely seal glass jars.

Hot-pack Method. Prepare fruit as for cold-pack method, place in a medium syrup and simmer for 5 minutes. Pack fruit carefully in hot, sterilized jars, cover with boiling syrup, completely seal and process in water bath 15 minutes.

Rhubarb. The first stalks of the season are tender and rich in color and flavor. Select young, tender stalks, trim, wash carefully and cut into desirable lengths (2 inches), being careful not to "string" in cutting. Add one-fourth as much sugar as rhubarb, by measure, and cook without water or bake until tender. Pack boiling hot in jars, completely seal and process containers of all sizes for 5 minutes in boiling water. To obtain a milder flavor, precook for one minute in boiling water and drain, before adding the sugar. Continue the process by directions given above.

Fruit Juices. Delicious fruit juices can be made from all soft

fruits such as raspberries, strawberries, dewberries, blackberries, elderberries, cherries and grapes. Select firm, ripe fruit. Wash, crush and heat to simmering point or about 185 degrees F. Strain thru several layers of cheesecloth. Add $\frac{1}{2}$ to $\frac{3}{4}$ cup sugar per quart of juice, stir well until dissolved, pour into hot, sterilized jars and process for 30 minutes at 180 degrees F., or about simmering point.

SCORE CARD FOR CANNED FRUIT

Fruit	50
Condition of product chosen; uniformly well ripened, graded to uniform size; not defective, tough or seedy; suitable condition for canning	20
Condition of finished product; natural clear, bright color, no artificial coloring; neither overcooked, mushy, nor uncooked in appearance; no preservative used; tender, shape well preserved	30
Syrup	20
Clear, bright, natural color of fruit, no sediment or foreign material.	
Consistency neither watery nor thick like preserves	
Pack	30
Neatness and uniformity; arranged to make best use of space. Fancy packs not acceptable. Small fruits canned whole, large fruits of convenient size to serve; neatly arranged.	
Proportion of fruit to syrup; jar should be well filled with product but not crowded, product well covered with syrup. Product evenly distributed thru jar, not settled at top or bottom.	
Container; of uniform or specified size, of clear, white glass. All containers should be clean, attractive, plainly and neatly labeled according to directions.	
TOTAL SCORE	100

DIRECTIONS FOR CANNING VEGETABLES

Asparagus. Asparagus for canning should be fresh and tender. It should be washed, graded for size, and all imperfect pieces discarded. If asparagus is cut in about one-inch lengths, boil two to four minutes in water to cover. Pack boiling hot in jars or cans, cover with water in which it was boiled and add 1 teaspoon of salt

for each quart container. If the stalks are not cut, tie the asparagus in uniform bundles, stand upright in kettle so that boiling water just reaches the top and boil three minutes, pack them with tips up, except two or three stalks in the center, cover with boiling liquid, add 1 teaspoon of salt per quart and process. Seal completely for processing in hot water bath, or partially for processing in pressure cooker.

Time of Processing.

Glass quarts, 35 minutes at 10 pounds pressure.

Glass pints, 30 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 30 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath or steamer.

180 minutes (3 hours) in oven at 250 degrees F.

Beans (String). Use only well-sorted, tender string beans. Large, coarse beans the seeds of which shell out easily are unsuited for canning. Wash thoroly, string and leave whole or cut in convenient lengths. Place in a saucepan, cover with boiling water and boil 5 minutes in uncovered saucepan. Pack containers boiling hot, add 1 teaspoon of salt for each quart and cover with liquid in which they were boiled. Seal completely for processing in hot water bath or partially for processing in pressure cooker.

Time of Processing.

Glass quarts, 35 minutes at 10 pounds pressure.

Glass pints, 30 minutes at 10 pounds pressure.

No. 2 and 3 tin cans, 30 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Beans (Lima, or butterbeans). Carefully sort and grade the beans for size and age. Beans to can should be young, green and tender. The old, white ones should be dried. Boil young beans 5 minutes in water to cover. Pack boiling hot in containers to within 1 inch of top, add 1 level teaspoon of salt for each quart, and cover with water in which the beans were cooked. Seal completely for processing in hot water bath or partially for processing in pressure cooker.

Time of Processing.

Glass quart jars, 55 minutes at 10 pounds pressure.

Glass pint jars, 50 minutes at 10 pounds pressure.

No. 3 tin cans, 50 minutes at 10 pounds pressure.

No. 2 tin cans, 40 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Soybeans (Green). Any variety of soybeans suitable for the table may be canned. Clean the beans, wash and precook in boiling water 5 minutes. Pour into hot containers, cover with boiling water and add 1 teaspoon of salt per quart. Partially seal for processing in pressure cooker or completely for water bath.

Time of Processing.

Glass quart jars, 90 minutes at 10 pounds pressure.

Glass pint jars, 80 minutes at 10 pounds pressure.

No. 3 tin cans, 85 minutes at 10 pounds pressure.

No. 2 tin cans, 70 minutes at 10 pounds pressure.

Baby Beets. Can only young, tender beets. Those of turnip shape and not over one to two inches in diameter are desirable. Leave on all the root and one inch of stem to prevent bleeding. Wash the beets thoroly and boil about 15 minutes or until skins slip easily. Slip skins, pack whole in containers, add 1 teaspoon of salt for each quart, cover with boiling water in which they have been cooked. Seal completely for processing in hot water bath or partially for processing in pressure cooker.

Time of Processing.

Glass quart jars, 35 minutes at 10 pounds pressure.

Glass pint jars, 30 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 30 minutes at 10 pounds pressure.

90 minutes (1½ hours) in water-bath.

150 minutes (2½ hours) in oven at 275 degrees F.

Carrots. Carrots may be either canned or stored. Fall carrots may be left in the ground as long as possible and stored for winter use. Only young, sweet carrots should be canned. Grade them for size, age and color and scrub with stiff vegetable brush. Slice, dice, quarter or leave whole. Precook five to ten minutes, according to age and size, pack immediately in hot containers, add 1 teaspoon of

salt for each quart, cover with boiling liquid in which they were precooked. Seal completely for precessing in hot water bath or partially for processing in the pressure cooker.

Time of Processing.

Glass quart jars, 35 minutes at 10 pounds pressure.

Glass pint jars, 30 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 30 minutes at 10 pounds pressure.

90 minutes (1½ hours) in water bath.

150 minutes (2½ hours) in oven at 275 degrees F.

Corn. Select sweet corn with kernels of uniform size and proper ripeness. When corn has passed the milky stage it is difficult to can successfully. Shuck, silk and clean carefully. Cut from the cob without precooking, add one-third as much boiling water as corn, by measure, heat to boiling point, add 1 teaspoon of salt to each quart and fill containers with the boiling mixture. Seal completely for processing in hot water bath, or partially for processing in pressure cooker. Do not pack too tight into the jars or fill the jars too full because corn swells. Care should be taken to pack No. 3 tin cans and quart jars loose because of the difficulty of heat penetrating to the center of the jar and thoroly sterilizing the corn.

Time of Processing.

Glass quart jars, 70 minutes at 10 pounds pressure.

Glass pint jars, 60 minutes at 10 pounds pressure.

No. 3 tin cans, 65 minutes at 10 pounds pressure.

No. 2 tin cans, 50 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Greens (Beet Tops, Kale, Mustard, Turnip, Spinach, Swiss Chard, etc.). Every family should have greens in their canning budget, whether of the cultivated or the wild variety. Use only fresh, crisp greens, discarding roots, coarse stems and withered leaves. Clean greens carefully by washing in running water or thru several waters, and lift them out rather than pour off the water. Steam or heat in covered vessel, with just enough water to prevent scorching, until completely wilted. Pack boiling hot product in containers being careful that the pack is not too solid and that the greens are covered with liquid in which they have been precooked.

Boiling water may be added if necessary. Add 1 teaspoon of salt to each quart. Seal completely for processing in hot water bath or partially for processing in pressure cooker. Care should be taken to pack tin cans and jars loose because heat penetrates greens slowly and the product in the center of the jar is apt to be insufficiently heated.

Time of Processing.

Glass quart jars, 65 minutes at 10 pounds pressure.

Glass pint jars, 60 minutes at 10 pounds pressure.

No. 2 tin cans, 55 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Okra. Select young, tender pods. Wash, cover with water and boil three to five minutes. Pack hot in containers, add 1 teaspoon of salt to each quart. Seal completely for processing in hot water bath or partially for processing in pressure cooker.

Time of Processing.

Glass quart jars, 40 minutes at 10 pounds pressure.

Glass pint jars, 35 minutes at 10 pounds pressure.

No. 3 tin cans, 30 minutes at 10 pounds pressure.

No. 2 tin cans, 25 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Peas (Green). Can only young, tender peas which have been graded for size, and be sure to can them as soon after picking as possible. Shell, discard the imperfect peas, and wash. Cover with hot water and boil 3 to 5 minutes. Pack hot product in jars to within one-half inch of top of jar, add a teaspoon of salt to each quart and cover with water in which they were cooked. Seal completely for processing in water bath or partially for processing in pressure cooker. Do not pack peas too tight in jars.

Time of Processing.

Glass quart jars, 60 minutes at 10 pounds pressure.

Glass pint jars, 45 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 40 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Peas (Black-Eyed). See directions for lima beans.

Pimientos (Peppers). The best sweet peppers for canning are the Spanish varieties known as pimientos. They should be ripe, sound, and in good condition. The pod is thick and fleshy, covered with a thick, tough skin which must be removed. Wash and prepare for peeling by placing in a dry pan in a hot oven (450 degrees F.) for six to ten minutes. Cool quickly by dipping in cold water and remove skins and seed cores. Flatten pimientos and pack dry in jars. Processing brings out a thick liquid which almost covers them. Add $\frac{1}{2}$ teaspoon of salt to each pint and partially seal. Process the required length of time. Seal completely and process in water bath.

Time of Processing.

Pint jars, 30 minutes in water bath.

No. 1 and No. 2 tin cans, 25 minutes in water bath.

75 minutes in oven at 275 degrees F.

Pumpkin. Wash, peel and cut into small pieces. Add small quantity of water and simmer until tender. Pack boiling hot into jars, add 1 teaspoon of salt to each quart. Seal completely for processing in water bath or partially for processing in pressure cooker.

Time of Processing.

Glass quart jars, 75 minutes at 10 pounds pressure.

Glass pint jars, 60 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 60 minutes at 10 pounds pressure.

180 minutes (3 hours) in water bath.

180 minutes (3 hours) in oven at 275 degrees F.

Sauerkraut. Pack cold sauerkraut in clean, hot jars; add no water or salt. Partially seal and process.

Time of Processing.

Glass quart or pint jars, 40 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 30 minutes at 10 pounds pressure.

60 minutes in water bath.

150 minutes in oven at 275 degrees F.

Squash. Directions the same as for pumpkin, except summer squash does not need to be peeled if it is tender.

Tomatoes. Select firm, ripe tomatoes of medium size and uniform shape. Never use overripe tomatoes or any part of those from

which decayed spots have been removed. Scald in wire basket or shallow pan until skins loosen, peel and remove core and stem end. Pack whole or cut in quarters, in jars, without crushing, and cover with boiling tomato juice prepared from small tomatoes. Never add water when canning tomatoes. Add 1 teaspoon of salt per quart, partially seal, process and completely seal.

Time of Processing.

Glass quart and pint jars, 10 minutes at 5 pounds pressure.

Glass pint and quart jars, 30 minutes in water bath.

No. 2 and No. 3 tin cans, 30 minutes in water bath.

45 minutes in oven at 275 degrees F.

NOTE. Spoilage often takes place if tomatoes stand for any length of time in a warm room, after they are packed, before processing.

Tomato Juice. Select firm, ripe tomatoes. Wash and remove stem end, cut in quarters and heat at simmering point in a covered kettle until the juice flows freely. Strain quickly, add 1 teaspoon of salt to each quart, reheat at once to nearly boiling point, pour into hot, sterilized jars and seal. Omit the salt if the juice is to be used for children. No processing is necessary.

Concentrated Vegetable Soup Mixture. Almost any desired combination of vegetables may be canned for soup mixture. A good combination is 1 quart of thick tomato pulp, 1 pint of corn, tiny lima beans or peas, 1 pint of okra, $\frac{1}{2}$ cup of chopped red sweet peppers, $1\frac{1}{2}$ teaspoon of salt. Cook together tomatoes and peppers, put thru a sieve to remove seeds, and cook to consistency of catsup. Add corn and other vegetables which have been previously prepared as for canning. Bring mixture to boiling point, pack hot and seal.

Time of Processing.

Glass quart jars, 70 minutes at 10 pounds pressure.

Glass pint jars, 60 minutes at 10 pounds pressure.

No. 3 tin cans, 65 minutes at 10 pounds pressure.

No. 2 tin cans, 50 minutes at 10 pounds pressure.

No. 2 and No. 3 tin cans, 180 minutes; glass jars, pints and quarts, 180 minutes in water bath.

Pecan Meats. Select nut meats which are in perfect condition.

Pack in sterilized jars. Partially seal and process for 10 minutes in steam pressure cooker at 5 pounds pressure or, after packing, place caps loosely on the jars, set in a pan of hot water and heat for 10 minutes to exhaust the cold air and prevent the nut meats from becoming rancid. Remove from the pan and seal immediately. Process for 20 minutes in the water bath.

Salted Pecan Meats. Melt 3 tablespoons of butter in a saucepan, add 1 pint of pecan meats and 1 tablespoon salt. Place over a low flame and stir constantly until the pecans are thoroly heated, being careful not to get them too hot. Pack in sterilized jars, completely seal and process in pressure cooker 30 minutes at 10 pounds pressure. These pecans will keep longer, as they are really toasted and have a delicious flavor.

English walnuts, hickory nuts and other nuts may be canned in the same way.

SCORE CARD FOR JUDGING CANNED VEGETABLES

Vegetable	60
Condition of product chosen; uniformly well ripened, graded to uniformity of size; not defective, not tough nor too old, stringy or woody; suitable condition for canning....	20
Condition of finished product; natural, clear, bright color, not unduly blanched nor darkened, no artificial coloring matter; not overcooked, shape well preserved, tender and crisp.....	40
Pack	40
Neatness and uniformity; pieces of appropriate size to serve, and attractively arranged. Fancy packs are not acceptable.	
Condition of liquid; should be clear; not cloudy, no bubbles, no sediment or foreign matter.	
Proportion of liquid to vegetable; jar should be full of product but not crowded and the product should be well covered with liquid.	
Container; of uniform or specified size, of clear, white glass, clean and attractive, plainly and neatly labeled according to directions.	
TOTAL SCORE	100

TIME TABLES FOR CANNING FRUITS AND VEGETABLES

Precook all vegetables and pack boiling hot. Cover with liquid in which they were heated, adding boiling water if necessary. Add 1 teaspoon of salt for each quart of vegetables. All containers of vegetables should be processed at ten pounds pressure unless otherwise noted.

TIME TABLE FOR FRUITS

Product	Precook or blanch	Syrup	Time of processing		
			Water bath		Oven 250 to 275 de- grees F.
			Glass jars	Tin cans	
			Qt. or Pt.	No. 2 & No. 3	
Apples	Precook in thin syrup 5 min.	Thin	5 min.	5 min.	
As sauce	Not precooked	Thin	15 min. 5 min.	10 min. 5 min.	
Apricots	—————	Thin	20 min.	15 min.	30 min.
Blackberries Blueberries Dewberries Huckleberries Loganberries Raspberries	No precooking	Medium	20 min.	15 min.	30 min.
	Simmer 5 min. in syrup	Medium	5 min.	5 min.	10 min.
Strawberries	See page 23				
Cherries	No precooking	Thick for sour cherries Medium for sweet	25 min.	20 min.	30 min.
Currants (see berries)	No precooking	Thick	20 min.	15 min.	30 min.
Fruit juices	See page 25				
Gooseberries	No precooking	Thick	20 min.	15 min.	30 min.
Peaches	Precook in medium syrup 5 min.		5 min.	5 min.	
	Not precooked	Medium	20 min. for ripe fruit 30 min. for firm fruit	15 min.	30 min.
Pears	Precook 4-3 min.	Medium	20 min.	15 min.	35 min.
Pineapple	No precooking	Thin	30 min.	25 min.	35 min.
	Precook 5 min.	Thin	30 min.	25 min.	
Plums	No precooking	Medium	20 min.	15 min.	45 min.
	simmer 5 min.	—————	15 min.	10 min.	10 min.
Quinces	Precook in syrup until tender	Thin	5 min.	5 min.	10 min.
Rhubarb	Cook with $\frac{1}{4}$ as much sugar as rhubarb by measure or	—————	5 min.	5 min.	10 min.
	Precook 5 min.	Medium	5 min.	5 min.	

TIME TABLE FOR VEGETABLES

Product	Precook by boiling	Time of processing (minutes)							Oven 250 degrees to 275 degrees F.
		Steam-Pressure canner, 10 lbs.			Water-bath canner or steamer		Tin cans No. 2 No. 3	Oven degrees F.	
		Glass jars	Tin cans	Glass jars	Tin cans				
Quart	Pint	No. 2	No. 3	Quart Pint	No. 2 No. 3	No. 2 No. 3	No. 2 No. 3		
Asparagus	2-4 min.	35	30	30	30	180	180	180	180
Beans, green or wax	5 min.	35	30	30	30	180	180	180	180
Lima	5 min.	55	50	40	50	180	180	180	180
Soy	5 min.	90	80	70	80	180	180	180	180
Baby beets	Enough to loosen skin (about 15 min.)	35	30	30	30	90	90	90	150
Carrots	5-10 min.	35	30	30	30	90	90	90	150
Corn	To boiling	70	60	50	65	180	180	180	180
Greens, including spinach Konirabi and parsnips	Until wilted See carrots	65	60	55		180	180	180	180
Okra	Boiling 3-5 min.	40	35	25	30	180	180	180	180
Peas, green	Boiling 3-5 min.	60	45	40	40	180	180	180	180
Peas, black-eyed	See lima beans	10				20 30	25*	75	
Pecans	In oven 6-10 min.								
Pimiento									
Pumpkin	Until tender	75	60	60	60	180	180	180	180
Sauerkraut	See recipe	40	40	30	30	60	60	150	
Soup mixture	See directions	70	60	50	65	180	180	180	
Squash	Until tender	75	60	60	60	180	180	180	180
Sweetpotatoes	Until skins slip readily	75	65	75	75	180	180	180	180
Tomatoes	Scald before peeling	(10	10	10	10)†	30	30	45	

* No. 1 and No. 2.

† Five pounds pressure.

**BUDGET FOR CANNING AND STORING FRUITS AND
VEGETABLES FOR A FAMILY OF FIVE**

A definite plan for the winter supply of vegetables and fruits, or a "budget," should be made. Vegetables and fruits may be preserved by storing, drying or canning. The following table indicates which vegetables may be satisfactorily dried or stored and which require canning in order to preserve them for the unproductive season. It is economical of time, energy and money to dry or store some vegetables. The Kentucky Food Habit Score Card suggests at least two liberal servings of fruit and two liberal servings of vegetables besides potatoes and dried beans every day. Fruit jellies, preserves, jams, etc., do not take the place of canned fruits because of the small proportion of fruit and large proportion of sugar.

Dried	Stored	Canned
Apples	Potatoes	Spring carrots
Corn	Sweetpotatoes	Baby beets
Lima beans	Cabbage	Beans, string
Seed beans	Fall squash	Greens
Shell beans	Pumpkins	Peas
	Parsnips	Asparagus
	Salsify	Corn
	Carrots (Mature)	Young lima beans
	Beets (Mature)	Soup mixtures
	Turnips	Peppers
	Saurerkraut	Pimientos
	Onions	Tomatoes
	Apples	Succotash

This budget is intended for families having no access to fresh foods after the growing season is over. If fresh foods such as celery, lettuce and spinach, oranges, bananas and grapefruit are purchased, or greens are available in the garden most of the year, the budget may be reduced accordingly. Where both stored and canned vegetables and fruits are mentioned the stored supply should be used first and the canned food after that supply is exhausted.

The budget suggests how many containers should be filled. The contents of a container should serve the family for one meal. A pint jar of some products serves a family of three or four persons and a quart jar, a family of six to eight. It is economy for a small family to can in pint and a large family in quart jars. If the family consists of more than five members, or fewer, the budget should be adjusted accordingly.

FRUIT AND VEGETABLE PRESERVATION BUDGET FOR A FAMILY OF FIVE

Food	Times served each week	No. weeks stored or canned food needed	Approximate amount needed for non-growing season for a family of five	
			Stored	Canned, No. of containers
Greens, wild and cultivated	3	16		48 pts.
Squash } Pumpkin }			24 together	
Carrots } Beets }	2	24	2 bushels	18 qts.
Parsnips } Salsify } Turnips }	1	18	3 bushels	
Green beans	1	24-28		24-28 qts.
Asparagus } Peas }	1	24-28		24-28 pts.
Tomatoes	2-3	40		80-120 qts.
Soup mixture	2	16		32 qts.
Sauerkraut } Cabbage } Onions }	4	24	{ 6 gallons 50 heads 2 bushels	8 qts.
Corn } Butterbeans }	1	32	8 qts. (dried)	32 pts.
Pimientos } Peppers }	For garnish			Canned
Potatoes } or sweet- } potatoes }	7-14	36	15-25 bu. together	
Navy beans	1		18 qts.	
Berries } Cherries } Grapes } Plums } Rhubarb } Peaches } Pears }	7	30		210 qts.
Apples	7 { 4 mo. fresh 3 mo. canned	28	5 bushels	24 qts.
Total			27-37 bu. fruits and vegetables 50 heads cabbage 24 pumpkins and squash 6 gals. kraut 26 qts. dried beans	234 qts. fruit 266-314 containers vegetables

Guide for estimating approximate amount of raw product needed to fill one quart container and the probable number of quarts of canned product from one bushel.

Kind	Approximate amount to can one quart	Approximate no. of qts. from 1 bushel
Fruit	pounds	quarts
Apples	2½	20 to 25
Berries	1½	1 crate—16 to 18
Cherries	1½	18 to 22 not pitted 8 to 10 pitted
Peaches	2 to 2½	18 to 20
Pears	2 to 2½	18 to 20
Pineapple	2	—
Plums	1½ to 2	20 to 30
Vegetables		
Asparagus	3	20 pints
Beans, string	1½ to 2	20 to 22
Beets	2½ to 3	17 to 20
Carrots	2½	20
Corn	10 to 12 small ears 5 to 6 large ears	12
Greens	2 to 3	6 to 7
Peas	1 shelled 3½ to 4 in pod	12 to 15
Pumpkin	4	—
Squash	4	—
Sweetpotato	2½ to 3	—
Tomato	3	16 to 18

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