



BULLETIN 112 REVISED, MARCH 1954

HOME CANNING
OF 28330
FRUITS, VEGETABLES,
AND MEATS
For South Carolina

Clemson Agricultural College, Winthrop College and
United States Department of Agriculture Cooperating
Extension Service

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The girl shown in the cover picture is Edith Wilson, Union County, state 4-H
canning winner and one of the six national canning club winners in 1950.

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FOREWORD

This bulletin has been prepared for use by South Carolina families as a guide in conserving fruits, vegetables, and meats for home needs.

Information from the United States Department of Agriculture, Bureau of Human Nutrition and Home Economics, has been adapted to meet conditions and needs of the state.

The information has been checked and approved by the South Carolina food conservation committee, which is made up of representatives from all organizations in the state that are engaged in teaching the conservation of food. For best results it is recommended that this bulletin be used in preparing and conserving food for future use in South Carolina.

Home Canning

OF

Fruits, Vegetables, and Meats

FOR

South Carolina

Margaret Martin, Extension Production and Conservation Specialist

Home canning for generations has been a practical and economical way to preserve food. By canning when foods are plentiful, we can have a well-balanced supply to last throughout the year. Yet we must remember that through the years methods have changed and have been greatly improved. Thus it is necessary for the home canner to be constantly on the alert in order to keep up with these improved methods.

Food, if it is to keep, must be free from the organisms that cause spoilage. These organisms are yeast, molds, and bacteria. Heating food to high temperatures will kill these organisms, but the food must then be sealed in an air-tight jar or can to keep fresh organisms away from food.

PLANNING FAMILY FOOD SUPPLY

Careful planning for the family food supply in advance will save the homemaker much time, work, and money. Use the canning budget recommended by the state nutritionist. Can only what you will need, but allow a few extra jars for guests or for other emergencies. Canned food does not improve with age and should not be kept over a period of years.

In planning for the family's food, other methods of food preservation should be considered. Some families are now conserving much of their food by freezing. Some foods are better frozen and some are better canned, while other foods may be conserved just by storing. All these factors must be considered by the individual homemaker in planning the family food supply.

SOUTH CAROLINA CANNING BUDGET

Basic Seven Food Groups*	Amount to Can (Quarts)	
	For family of five	For one person
1. Green and yellow vegetables ----- (equally distributed among green beans, okra, green as- paragus, green peas, carrots)	50-60	10-12
2. Tomatoes and/or tomato juice ----- Sauerkraut -----	100-125 20-30	20-25 4-6
3. Other vegetables and fruits		
a. Soup -----	20-30	4-6
Lima beans -----	20-30	4-6
Beets, squash, corn -----	30-50	6-10
b. Fruits and fruit juices		
Peaches -----	50-70	10-14
Apples and apple sauce -----	25-30	5-6
Berries -----	25-35	5-7
Pears -----	15-25	3-5
Fruit juices -----	50-100	10-20
Miscellaneous -----	10-40	2-8
4. Milk and milk products cannot be canned at home.		
5. Meats and poultry -----	50-75	10-15
6. Bread, flour, cereals—May be stored.		
7. Butter and fortified margarine—May be frozen for short time only.		

* For Chart of Basic Seven Food Groups, see back cover.

Foods suitable for freezing can be frozen in same amounts and counted as part of canning budget.

Note: This budget was planned on a basis of 6 months only. Fresh foods are available in South Carolina at least 6 months in the year. Families living in the "low country," where the weather permits longer growing seasons, should make the necessary adjustments.

Canning Arithmetic

Showing the amount of canned food from fresh produce

Canned Fruits and Tomatoes from Fresh Products

Fruit	Amount Fresh	Amount Canned
Apples	1 bushel (48 lb.) 2½ to 3 lb.	16 to 20 quarts 1 quart
Berries (except strawberries)	24-quart crate 5 to 8 cups	12 to 18 quarts 1 quart
Cherries (with stems)	1 bushel (56 lb.) 6 to 8 cups	22 to 32 quarts 1 quart
Peaches	1 bushel (48 lb.) 2 to 2½ lb.	18 to 24 quarts 1 quart
Pears	1 bushel (56 lb.) 2 to 2½ lb.	20 to 25 quarts 1 quart
Plums	1 bushel (65 lb.) 2 to 2½ lb.	24 to 30 quarts 1 quart
Strawberries	24-quart crate 6 to 8 cups	12 to 16 quarts 1 quart
Tomatoes	1 bushel (53 lb.) 2½ to 3 lb.	15 to 20 quarts 10 to 12 quarts (juice) 1 quart

Canned Vegetables from Fresh Products

Vegetable	Amount Fresh	Amount Canned
Beans, Lima	1 bushel (32 lb.) 4 to 5 lb.	6 to 8 quarts 1 quart
Beans, snap	1 bushel (30 lb.) 1½ to 2 lb.	15 to 20 quarts 1 quart
Beets (without top)	1 bushel (52 lb.) 2½ to 3 lb.	17 to 20 quarts 1 quart
Carrots (without top)	1 bushel (50 lb.) 2½ to 3 lb.	16 to 20 quarts 1 quart
Corn (sweet, in husk)	1 bushel (35 lb.) 6 to 16 ears	8 to 10 quarts 1 quart
Greens	1 bushel (18 lb.) 2 to 3 lb.	6 to 9 quarts 1 quart
Peas, green	1 bushel (30 lb.) 4 to 5 lb.	6 to 7 quarts 1 quart
Squash	1 bushel (40 lb.) 2 to 2½ lb.	16 to 20 quarts 1 quart
Sweet potatoes	1 bushel (54 lb.) 2½ to 3 lb.	18 to 22 quarts 1 quart

METHODS OF CANNING

The two methods used for canning are the following:

Boiling Water Bath for tomatoes and fruits or foods containing acids.

Steam Pressure Cooker for all meats and all vegetables except tomatoes. These are the nonacid foods.

The boiling water bath heats the food to a temperature of 212°F., which is sufficient to kill bacteria in foods that contain acids. Fruits and tomatoes contain acid, and this acid helps to kill bacteria or keeps them from growing.

With the pressure cooker a high temperature of 240°F. can be secured. It takes a temperature this high to kill certain dangerous organisms often found in nonacid foods.

THINGS NOT TO DO

Do not add "canning powders" to canned foods. These acids will kill bacteria, but they may also cause serious trouble in the body. Especially is this true of young children or persons with some digestive trouble.

Do not can by the open kettle method. Boiling the food in the open kettle will destroy organisms, but fresh ones may get into the food while it is being transferred from the kettle to jar.

Do not can in the oven. This method is dangerous because jars often explode in the oven, and because oven temperatures are not constant enough to kill all the dangerous organisms.

Do not can in a pressure saucepan.

EQUIPMENT FOR CANNING

Good equipment kept in good clean condition is necessary for high quality canning. The utensils may be made of aluminum, tin, glass, enamel. Do not use copper, iron, or galvanized utensils, as these might cause an off-taste and discoloration. However, there is no danger of food poisoning from the use of these utensils, if all are kept clean.

Boiling Water Bath

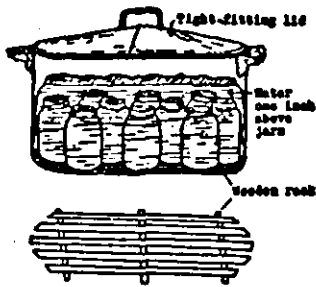


Figure 1. Arrangement of jars in boiler. Note suggested type of wooden rack to be placed in bottom of boiler.

A boiling water bath container may be bought as such or made at home. It must be deep enough to hold jars upright on a rack and allow the water to come up 1 to 2 inches over the tops.

The rack may be made of heavy chicken wire, wooden slats, or any other material that has openings and that will prevent the jars from touching the bottom of the container.

Steam Pressure Cooker

A pressure cooker should be standard equipment in every kitchen. There are models and sizes available for the needs of every family. Pressure saucepans are not recommended for canning.

A pressure cooker is one of the most valuable pieces of equipment in your home. You have a considerable amount of money invested in your cooker; so take good care of it and use it. A cooker well taken care of will last for a long time.

A cooker is not dangerous if it is used right. Ninety-nine out of every one hundred accidents with cookers are caused by carelessness or failure to follow instructions. By all means, read all the instructions that come with your cooker. Learn the names of all the parts and how to take care of them.

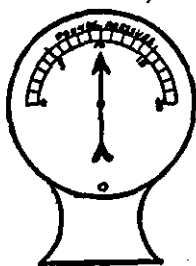
Care of the Body of Your Cooker. Keep it clean; never put a cooker away until it has had a thorough washing with hot water and good soap. When you wash it with soap, be sure that all soap is thoroughly rinsed off and that the cooker is dried well. Keep your cooker polished with steel wool. Never scour with harsh scouring powder or strong soap.

Steel wool used with the red soap that comes with it is the very best cleansing agent. For very stubborn stains, use vinegar with the steel wool and red soap. The inside of your cooker can be brightened by cooking tomatoes or apples in it. It does not harm the tomatoes and apples. If you have no tomatoes or apples to cook, try this: Fill cooker half full of water, add about a cup of vinegar, fasten lid, let water come to a boil until the steam comes out of petcock, let pressure go to 5 pounds and hold for 10-15 minutes. Open cooker and pour out water.

Vinegar is used for this purpose because it is an acid. Most cookers are made of aluminum. When salt, soda, or other strong alkali is used with aluminum, the metal turns dark, and, if salt is left in contact with aluminum, the salt eats out little pits or holes. The use of vinegar or acid neutralizes or kills the alkali and protects your cooker. Strong soaps and scouring powder contain alkali that harms your cooker.

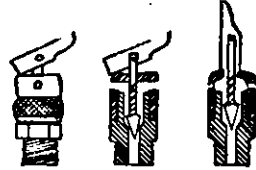
Storing the Cooker. Never fasten the lid down tight when you put the cooker away. Stuff the cooker with newspaper; wrap the lid with paper and turn it with top down on cooker and store in a clean place.

The Gasket or Seal. Some cookers have rubber gaskets; others have only the metal-to-metal seal. If your cooker has no rubber gasket, keep the metal edge that makes the seal clean and slick. Scrub it with fine steel wool. If your cooker has a rubber, be sure that the rubber is kept clean and free from grease. If it gets too loose and leaks steam, take out the rubber and stretch it a little all around, turn it over, and put back in proper place after cleaning out the little groove in which the gasket fits. Never grease the rubber; if it sticks, dust it with talcum powder or cornstarch.



Gauge. Learn what the gauge looks like. (It is the round dial that tells you the pressure.) Do not lift top of cooker by gauge. Do not let dirt, grease, or moisture get in your gauge. Have it tested every year.

Safety Valve. This is the part of your cooker that keeps it from blowing up. It is made so that it lets the steam off when pressure gets too high. Unscrew top of valve with fingers, checking to see that the little steel ball or point is clean and that the little spring is working. Clean the valve every time you use the cooker.



Petcock. The petcock is the opening that lets the air out of your cooker. Most of the newer cookers have the petcock as a part of the safety valve.

Pressure Saucepans. Pressure saucepans are made for cooking food, but they are not recommended for use in canning. Canning in the pressure saucepan requires adjustments in the processing time. Full information is not available now about timetables for canning in the saucepan.

Containers

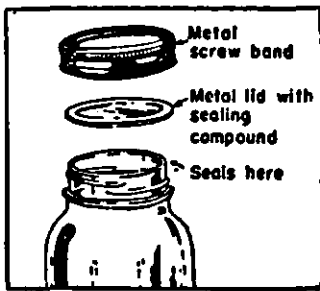
Tin Cans. If tin cans are used, be sure to get the kind made for home canning. These are made so that they can be re-used while commercial cans are not.

There are two types of cans—enameled and plain. Enameled cans come in “R” enamel (a deep dull gold) and “C” enamel (a light gold). Plain cans are suitable for most foods. However, they tend to bleach some foods, such as berries, tomatoes, beets, pumpkin, and squash, and “R” enamel cans are preferred for these foods. Since some products, such as corn, succotash, lima beans, and red kidney beans, tend to darken when packed in plain cans, “C” enamel cans are often used for these products.

Covers or lids for cans also come in two types—those with gaskets or rings of sealing compound under the lid and those with paper gaskets. Those with paper gaskets are not recommended for home use.

Glass Jars. There are several kinds and sizes of glass jars used for canning. It is best always to buy regular mason jars that are made for canning. Commercial jars in which mayonnaise, peanut butter, coffee, and other such foods are sold are not suitable for hot-water and pressure-cooker canning.

The most common types of jars and closures now on the market are described below:

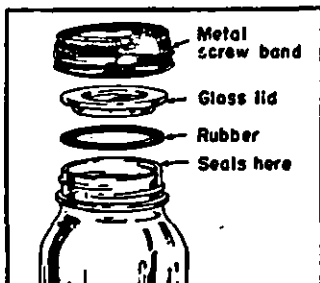


1. **Flat metal two-piece tops.** These consist of a flat top with the rubber already on the metal, and a screw band to hold the top in place until the jar is sealed.

These are self-vacuum sealing, require no separate rubber, and are safe and easy to use if instructions are followed. The tops are not re-usable but the metal band may be removed after the jar has cooled and used many times over.

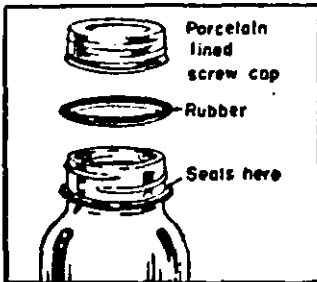
Some metal tops have a lining of white enamel; others have only the metal top. Both types are safe and good for use with all foods.

To use these flat-top closures: Dip the lid in hot water for a minute, wipe rim of jar clean, and put lid on jar with sealing compound (rubber) next to jar. Screw metal band down tightly by hand. After the jar has been processed, do not tighten or screw band until 24 hours have passed—then remove band. The jar is vacuum-sealed and needs no further attention.

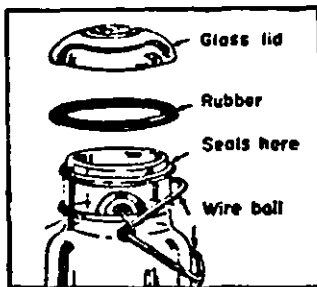


2. **Flat glass two-piece top.** These are similar to the tops described above except that glass is used instead of the metal top and a separate rubber is necessary. To use: Dip rubber in hot water and fit on glass lid. Put lid on jar, rubber side down. Screw band tight; then loosen about a quarter turn. Be sure the band and jar top fit well.

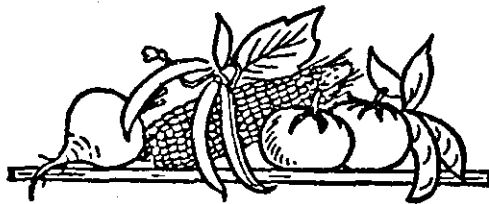
After processing, just as soon as you take jar from canner, screw band down tight. After 24 hours, remove metal band. If the seal is all right, the jar may be lifted by the lid.



3. Porcelain-lined zinc caps. These are one-piece tops, but require separate rubber. To use: Dip rubber in hot water, place on jar, wipe edge of jar, and screw top on tight. Just as soon as the processing time is over and the jars are removed from canner, screw top down tight.



4. Wire bail jars. These have a glass top with a wire bail that holds top on jar. These too require a separate rubber. To use: Dip rubber in hot water, place on jar, then put on glass top. Slip the bail into place over lid so that it fits into groove. Then push the other wire bail down against side of jar. The jar is then sealed. Do not bother the wire bail after processing.



GENERAL DIRECTIONS FOR CANNING TOMATOES AND FRUITS

See tables on pages 16 and 17 for details. Use only firm, ripe, freshly gathered fruit in good condition. Take out all bruised, decayed, or under-ripe fruit. Prepare only as much fruit as you can handle quickly at one time.

Wash fruit in cool water by lifting it from the wash water rather than by pouring off the water.

Peel fruit and cut in desired-size pieces. Make a sirup according to the sirup table at bottom of this page. Heat the sirup to boiling, and then carefully drop fruit in sirup and cook the recommended time.

For South Carolina, the hot-pack method is recommended for all fruit canning as well as for tomatoes. Tomatoes are canned in their own juice. Salt may be added if desired.

Pack fruit quickly into hot jars. Leave ½-inch headspace in jars and ¼ inch in tin cans. Take out air bubbles by running a table knife or spatula down the side of the container. If air bubbles are not removed, liquid may not cover product in jar. Wipe the top of jar with clean, damp cloth. Adjust the lid and seal.

As each container is filled, place in water bath. The water should be 2 inches above top of jars. Cover water bath and count processing time when the water starts boiling.

When processing time is up, take jars out of water bath. Complete the seal on zinc one-piece lids and on glass lids with separate screw bands. Set jars to cool on a rack or towel away from draft. Cool overnight.

Test jars after 24 hours. Never turn jars upside down to test, as this practice will often cause the seal to break. Test flat metal lids by tapping with a spoon. A clear ringing sound indicates a good seal.

To test jars with separate rubber rings, tilt the jar in the hand to see if there are any leaks. If jars are not completely sealed, use at once.

Remove screw bands, label jars with kind of food and date, and then store in cool dark place.

Table for Sirup

Sirup	Sugar, cups	Water or juice, cups
Thin -----	1	3
Moderately thin -----	1	2
Medium (for sour fruit) -----	1	1

Timetable for Fruits and Acid Foods

Kind of Food	How to Prepare	Time to process in boiling water bath at 212°F.			
		Jars		Cans	
		Pt.	Qt.	No. 2	No. 3
		Min.	Min.	Min.	Min.
Apples.....	Pare, core, cut in pieces. Steam or boil in thin sirup or water 5 minutes. Pack hot; cover with hot liquid. Or make apple sauce, sweetened or unsweetened. Pack hot.	15	15	10	10
		10	10	10	10
Beets, pickled.....	Cook beets until tender in water to cover. Remove skins; slice or dice. Pack hot; add ½ teaspoon salt to each pint. Cover with boiling vinegar sweetened to taste.	30	30	30	30
Berries (except strawberries).....	If berries are firm, precook, adding just enough medium sirup or juice to prevent their sticking to pan. Pack hot; cover with hot liquid. If berries are soft, fill jars with raw fruit; cover with boiling sirup or juice.	15	15	15	15
		20	20	15	15
Cherries.....	Can cherries with or without pits. Follow directions for berries.	20	20	20	20
Figs.....	Cover with boiling water; let stand for 5 minutes. Drain and rinse. Boil for 1 hour in medium sirup. Pack hot; cover with sirup.	20	20	15	15
Peaches.....	Remove skins and pits. Precook juicy fruit slowly until tender, adding ½ cup sugar to 1 pound of fruit to draw out juice. Precook less juicy fruit in thin to medium sirup. Pack hot; cover with boiling juice or sirup.	20	20	15	15
Pears.....	Peel, cut in halves, core. Otherwise same as peaches.	20	20	20	20

Pimientos, ripe.....	Place in hot oven for 6 to 8 minutes. Dip into cold water. Remove skins, stems, seed cores. Pack and add ½ teaspoon salt to each pint. Do not add liquid. or Steam until wilted and pack with peeling on. Peeling may be removed when used.	40	40	40	40
Plums, prunes.....	Put up plums whole or in halves. Prick skin of each whole plum. Precook 3 to 5 minutes in juice or thin to medium sirup to sweeten. Pack hot; cover with boiling juice or sirup.	20	20	15	15
Sauerkraut.....	Heat well fermented sauerkraut to simmering—do not boil. Pack into jars; cover with hot sauerkraut juice. Leave ¼-inch headspace.	25	30	25	30
Strawberries.....	Stem berries and add ½ cup sugar to each quart of fruit. Bring slowly to boil. Remove from stove and let stand overnight. Bring to boil. Pack hot; cover with hot juice.	15	15	10	15
Tomatoes.....	Scald and peel; remove stem end and bad spots. Quarter or leave whole. Heat to boiling. Pack hot and add 1 teaspoon salt to each quart.	10	10	10	10
Tomato juice.....	Remove stems and all green and bad spots. Cut into pieces. Simmer until softened. Put through a fine sieve. Add 1 teaspoon salt to each quart. Reheat at once just to boiling. Fill into hot jars immediately. Leave ¼-inch headspace.	15	15	15	15
Fruit juices.....	Berries, apple juice, grapes, or blends of fruits—remove any pits; crush the fruit. Heat gently to 170° F. (below simmering) until soft. Strain through a cloth bag. Add sugar if desired—about ½ to 1 cup sugar to 1 gallon of juice. Heat to 170° F. again; fill into hot jars or bottles. Leave ¼-inch headspace.	20	20	20	20

CANNING VEGETABLES

Select only fresh, young, tender vegetables for canning. The fresher they are and the quicker they are put into the jar, the better the canned product will be. Two hours from the garden into the can is a good rule. If vegetables are purchased for canning, it is best to get them from local gardens.

Wash the vegetables thoroughly. Lift vegetables out of water while washing. Scrub root vegetables with a brush.

After washing, trim the vegetables and cut for canning. Remove coarse stems from greens and be sure that no grit or dirt or insects are left clinging to leaves.

The hot-pack method is recommended for all South Carolina vegetables. Therefore, all vegetables must be heated before putting in jars. Start them in boiling water and precook the number of minutes given in the table on pages 19 and 20.

While vegetables are heating, get lids and jars ready. The jars may be sterilized by boiling 10 minutes ahead of time. Heat jars, place on tray, add salt, (1 teaspoon for each quart or $\frac{1}{2}$ teaspoon for pints).

When vegetables have cooked the recommended time, pack quickly into hot jars. Leave 1-inch headspace for starchy vegetables and $\frac{1}{2}$ inch for all other vegetables. Cover vegetables with the hot liquid in which they were cooked. Remove all air bubbles with knife or spatula, and press the product firmly in jar with a spoon.

Wipe top of jar with a clean, damp cloth. Put on lids and adjust.

See that there are 2 to 3 inches of water in pressure cooker and as each jar is filled place in cooker. Fill only enough jars to fill cooker. Filled jars kept and allowed to cool between filling and processing often develop a flat, sour, or other off-taste.

Adjust lid on cooker, open petcock, let steam escape from petcock for 5 to 7 minutes so that all air is driven out of cooker and you will be assured of steam pressure rather than air pressure.

Close petcock and let pressure on dial come to 10 pounds. Start counting time and keep the pressure at 10 pounds by adjusting heat under canner. Process all vegetables at 10-pounds' pressure for the number of minutes recommended on tables. Do not process pint and quart jars at the same time.

When processing time is up, remove cooker from heat, and if glass jars are used allow the pressure gauge to go to zero. Open petcock slowly to let all steam escape. If using tin cans, the petcock may be opened before pressure goes down.

Place jars aside to cool. After 24 hours, test for seal, label, and store.

Timetable for Vegetables

Kind of Food	How to Prepare	Time to process in pressure canner at 10 pounds (240°F.)			
		Jars		Cans	
		Pt.	Qt.	No. 2	No. 3
		Min.	Min.	Min.	Min.
Asparagus-----	Cut into 1-inch lengths. Cover with boiling water; boil 2 to 3 minutes. Pack hot; cover with hot cooking liquid.	25	55	20	—
Beans-----	Fresh lima. Can only young, tender, beans. Cover with boiling water; bring to boil. Pack hot; cover with hot cooking liquid. (See note)	35	60	40	50
	Snap. Cut into pieces. Cover with boiling water and boil 5 minutes. Pack hot; cover with hot cooking liquid.	20	25	25	30
Beets-----	Before washing, trim off tops leaving tap-root and 1 inch of stem. Boil until skins slip easily—baby beets take about 15 minutes; older beets longer. Skin and trim. Slice older beets. Pack hot; cover with fresh boiling water.	30	35	25	30
Carrots-----	Slice and boil 5 minutes in water to cover. Pack hot; cover with hot cooking liquid.	20	25	20	35
Corn-----	Whole-grain. Cut corn from cob so as to get most of the kernel but not the husk. Add 1 teaspoon salt to each quart of corn and half as much boiling water as corn. Heat to boiling and pack hot. Add no more salt and no extra water.	55	85	60	—
	Cream style. Prepare like whole-grain, except cut kernels slightly farther from cob and scrape cob. Do not can in quarts. (See note)	85	—	105	—
Greens-----	Discard imperfect leaves and tough stems; wash out all dirt. Boil in small amount of water until wilted. Pack hot and not too solid. Cover with hot cooking liquid.	45	70	60	105

Okra.....	Can only tender pods. Cover with boiling water and bring back to boil. Pack hot; cover with hot cooking liquid.	25	40	25	35
	With tomatoes. Heat sliced okra and tomato sections to boiling. Pack hot. (Tomatoes will provide liquid.)	25	35	25	35
	With corn and tomatoes. Heat sliced okra, whole-grain corn, and tomato sections, to boiling. Pack hot. The processing times given are for a mixture of 3 parts of tomato pulp to 1 part each of okra and corn.	55	85	60	65
Peas.....	Green. Cover with boiling water, boil about 5 minutes. Pack hot; cover with hot cooking liquid.	40	40	30	40
	Black-eyed. Same as lima beans. (see note)	35	60	40	50
Pumpkin.....	Peel and cut into 1-inch cubes. Add a little water and bring to boil. Pack hot; cover with hot cooking liquid.	55	90	50	75
Squash.....	Summer. Do not peel. Otherwise same as for pumpkin.	30	40	20	40
	Winter. Same as pumpkin.	55	90	50	75
Sweet potatoes.....	Boil or steam until skin slips easily. Skin; cut into pieces. Pack hot; cover with boiling water, or light syrup.	55	90	70	90
Vegetable-soup mixtures.....	Prepare the okra and tomatoes as given for okra and tomatoes. Select tender, green lima beans. Use only tender fresh corn. Use in the following proportions: 6 cups tomatoes, 1 cup okra, 1 cup lima beans, 1 cup corn. Place tomatoes in the bottom of an enamel pan and add other vegetables. Bring the mixture to a boil and boil 5 minutes. Pack hot with sufficient liquid to cover the vegetables. If not sufficient liquid, add hot tomato juice.	60	70	50	65

Note: Corn, lima beans, green peas, and black-eyed peas should be canned in pints only.

HOME CANNING OF MEAT

It is a good and thrifty practice for farm families to can home-produced meats to spread the supply throughout the year.

With canned meat on the shelf, you will quickly have a savory stew, meat pie, or many other good dish time-savers for busy days—and an easy solution to emergency food problems that arise.

Of course the usual supply should be conserved by curing the cuts that are desirable cured. Many families with home or commercial frozen food boxes will freeze a part of the meat food supply. Each family should make careful plans to conserve the supply in the most practical and economical way.

Directions given here tell how to can meat safely as well as how to hold food value and flavor.

What to Can. Beef, veal, mutton, lamb, pork, and rabbit are all successfully canned at home. So are various kinds of poultry—chicken, duck, goose, guinea, squab, turkey. Meat of large game animals may be canned like beef; that of game birds and small game animals like poultry.

What Not to Can. Mixtures such as the following are not recommended for home canning: Chile con carne, hash and stews made with vegetables, head cheese, liver paste, pork and beans, scrapple, soups made with cereals and vegetables.

Commercial canners succeed with these specialties because they have the needed equipment and laboratories to check their results. For the home canner it is safer to can each food by itself and combine when ready to serve.

Can fresh, clean, cold meat. Can only meat from healthy animals in tip-top condition, slaughtered and handled in a strictly sanitary way.

After killing, chill meat at once and keep it chilled until canning time; or else can the meat as soon as body heat is gone from it. Chilled meat is easier to handle.

Chilling calls for refrigeration or for weather that can be counted on to keep the meat at 40° F. or lower. Meat held at temperatures near freezing may be canned at any convenient time within a few days after killing.

Avoid freezing meat, if possible. If meat does freeze, keep it frozen until canning time. Thawed meat is very perishable. Cut or saw the frozen meat into strips 1 or 2 inches thick just before canning.

Do not fry meat to can. It is best not to fry meat before canning. The brown crust that tastes so good in fresh-cooked chicken or steak becomes dry and hard, and the canned meat may even have a disagreeable flavor.

Salt does not help preserve meat in canning. Add it if you wish for seasoning.

Use a steam-pressure canner to can meats. For safe canning, meat must be heated through and through in a canner. "Processing" is the word for this. The meat must be processed at sufficiently high temperature and held there long enough to make sure of killing bacteria that cause dangerous spoilage.

The only practical way to get this high temperature is by using a steam-pressure canner. By holding steam under pressure this way, you can quickly get a temperature of 240° F. or more.

If meat is not properly processed, it may spoil or even lead to serious food poisoning.

If you have no steam-pressure canner, try to team with a neighbor who has one or go to a food-preservation center where there is steam-pressure equipment. Otherwise, preserve the meat some other way—by curing or freezing.

It is not safe to can meat in—a boiling water bath, an oven, a steamer without pressure, or an open kettle. None of these will heat the meat hot enough to kill dangerous bacteria in a reasonable time.

Oven canning is impossible with tin cans, and it is not safe with glass jars. Even though oven temperature goes to 250° F. or higher, food inside jars stays at about boiling—212° F. Moreover this method has caused serious burns and cuts. Jars in an oven may burst, blowing out the oven door.

If you use tin cans, use plain tin cans in good condition. "C" enamel and "R" or Sanitary enamel cans prevent some foods from discoloring, but this is not the case with meats. The fat may cause the enamel to peel off, and, while this is not harmful, it makes the canned meat look unattractive. So use only plain tin cans, preferably with paper gaskets, for meat.

See that cans, lids, and gaskets are perfect. Discard badly bent, dented, or rusty cans and lids with scratched or torn gaskets.

Chicken

Directions given here for chicken apply also to other poultry, rabbit, and small game. For well-flavored canned chicken, select plump stewing hens. Young birds need the same processing; therefore they often lack flavor and may cook to pieces.

Confine birds 12-24 hours before canning. Avoid bruising; bleed thoroughly. Dress the chicken as for cooking. Cut into the usual-sized pieces for serving. Keep thoroughly chilled until ready for canning.

Hot Pack, With Bone.

1. Bone the breast; saw drumsticks off short, if desired, but leave bone in other meaty pieces, such as second joints. Trim off large lumps of fat. Sort into meaty pieces and bony pieces. Set aside giblets to can separately.

2. Broth or hot water will be needed as liquid. Use bony pieces to make broth. Cover them with cold water and simmer until meat is tender. Drain broth into bowl; skim off fat. Remaining meat stripped from bone may be canned as little pieces.

3. Pour hot broth or hot water over raw meaty pieces in cooking pan to cover meat. Put on lid and precook until meat is medium done, or when cut shows almost no pink color at center of pieces. Stir occasionally so that meat will heat evenly.

4. If salt is desired, put level measure into clean empty containers: ½ teaspoon in pint jar or No. 2 can; ¾ teaspoon in No. 2½ can; 1 teaspoon in quart jar or No. 3 can.

5. Pack second joints and drumsticks. Have skin next to glass or tin. Fit breasts into center and smaller pieces where needed. Leave about one inch above meat in glass jars for headspace; one-half inch in tin cans.

6. Cover meat with hot broth, using about ½ to ¾ cup for each quart container. Leave 1 inch for headspace in jars; fill cans to top.

7. Work out air bubbles with knife. Add more liquid, if needed, to cover meat. Be sure to leave 1-inch headspace in jars and have tin cans filled to top.

8. Adjust lids on glass jars; seal tin cans.

9. Process at once in the steam pressure canner at 10-pounds' pressure (240° F.).

Pint jars -----	65 min.	No. 2 cans -----	55 min.
Quart jars -----	75 min.	No. 2½ and 3 cans ----	75 min.

Hot Pack, Without Bone.

Follow directions for hot-packed poultry with bone, with these exceptions:

Remove bone—but not skin—from meaty pieces. You can bone poultry, either raw, or after precooking.

Boned poultry must be processed in the steam pressure canner longer than poultry with bone. Process at 10-pounds' pressure (240° F.).

Pint jars -----	75 min.	No. 2 cans -----	65 min.
Quart jars -----	90 min.	No. 2½ and 3 cans ----	90 min.

Beef, Veal, Pork, Lamb

For canning as large pieces, use loin and other cuts suitable for roasts, steaks, or chops. For canning as stew meat, use the less tender cuts and smaller pieces.

Cut meat from bone. Set aside bones to make broth or soup. Trim away most of the fat without unduly slashing the lean.

For larger pieces, cut into pieces that will slip easily into the glass jars or tin cans with the grain of the meat running lengthwise.

The smaller pieces of stew meat are handled and processed just like larger pieces.

Hot Pack.

1. Put meat in large shallow pan; add just enough water to keep from sticking. Cover pan and precook meat slowly until medium done, stirring occasionally so that meat will heat evenly.

2. If salt is desired, put level measure into clean, empty containers: ½ teaspoon in pint jars or No. 2 cans; ¾ teaspoon in No. 2½ cans; 1 teaspoon in quart jars or No. 3 cans.

3. Pack meat hot. Leave about 1 inch above meat for headspace in glass jars; ½ inch in tin cans.

4. Cover with meat juice, adding hot broth or water if needed. Again leave one inch at top of glass jars for headspace; fill tin cans to top.

5. Work out air bubbles with knife. Add more liquid, if needed, to cover meat. Be sure to leave 1-inch headspace in jars, and have cans filled to top.

6. Adjust lids on glass jars; seal tin cans.

7. Process at once in the steam-pressure canner at 10-pounds' pressure (240° F.).

Pint jars -----	75 min.	No. 2 cans -----	65 min.
Quart jars -----	90 min.	No. 2½ and 3 cans ----	90 min.

Ground Meat

For grinding, use small pieces of meat from the less tender cuts, but make sure the meat is fresh and kept clean and cold. Never mix in scraps of doubtful freshness, as they may spoil a whole batch; and don't use lumps of fat.

If desired, add 1 level teaspoon of salt to the pound of ground meat, mixing well.

1. Form ground meat into fairly thin cakes that can be packed in glass jars or tin cans without breaking.

2. Put meat cakes into cooking pan. Precook in oven until medium done or, when cut into, red color at center of cakes is almost gone.

3. Pack cakes hot. Leave 1 inch above meat in glass jars for headspace; ½ inch in tin cans.

4. Skim fat off drippings and do not use the fat in canning.

5. Cover with meat juice, adding hot water if needed. Leave about 1 inch above meat in glass jars for headspace; fill tin cans to top.

6. Work out air bubbles with knife. Add more liquid, if needed, to cover meat. Be sure to leave 1-inch headspace in jars, and have cans filled to top.

7. Adjust lids on glass jars; seal tin cans.

8. Process at once in the steam-pressure canner at 10-pounds' pressure (240° F.).

Pint jars -----	75 min.	No. 2 cans -----	65 min.
Quart jars -----	90 min.	No. 2½ and 3 cans ----	90 min.

Sausage

Use any tested sausage recipe, but omit sage as it is likely to give the canned sausage a bitter flavor. Go easy with other spices, onion, and garlic, because flavors change with processing and storing.

Shape sausage meat into cakes. Precook, pack, and process like ground meat, hot packed.

Heart and Tongue

The heart and tongue are generally used as fresh meat. If you do wish to can them, follow directions for beef, veal, pork, lamb as hot packed, with these differences:

Heart—Remove thick connective tissue before cutting into pieces.

Tongue—Drop tongue into boiling water and simmer about 45 minutes or until skin can be removed, before cutting into pieces.

Soup Stock

1. Make fairly concentrated stock by covering bony pieces of chicken or other meat with lightly salted water and simmering until meat is tender. Do not cook too long, or soup will lose flavor.

2. Skim off fat, remove all pieces of bone, but do not strain out meat and sediment.

3. Pour hot stock into containers. Leave 1 inch at top of glass jars for headspace; fill tin cans to top.

4. Adjust lids on glass jars; seal tin cans.

5. Process at once in pressure canner at 10-pounds' pressure (240° F.).

Pint jars ----- 20 min.
 Quart jars ----- 25 min.

No. 2 cans ----- 20 min.
 No. 2½ and 3 cans ---- 25 min.

TO FIGURE YIELD OF CANNED MEAT FROM FRESH MEAT

Here is a table to help you figure how many glass jars or tin cans of meat you will get from a given quantity of fresh meat:

For a quart jar or No. 3 can, allow about—

5 to 5½ lb. of pork loin (untrimmed)

5 to 5½ lb. of beef rump (untrimmed)

3 to 3½ lb. of beef round (untrimmed)

4½ to 5½ lb. of chicken (dressed, undrawn) to be canned with bone

7 to 8 lb. of chicken (dressed, undrawn) to be canned without bone.

WHEN CANNING IS DONE

Look for Leaks. If you can in glass jars, test for leaks the day after canning when the jars are thoroughly cooled.

If you can in tin, examine seals when you wipe the cooled cans. Also set out any can that buckles and breaks its seams—too little food in the can, or too fast cooling causes this type of leak.

If any jar or can has leaked, either use the food at once or can it all over again, using another container. Heat the meat all through; then pack and process in the steam-pressure canner for the same time as if meat were fresh.

Label Plainly. Label each good glass jar or tin can, so that you will know the contents and date. If you canned more than one lot in a day, add the lot number. Then if any meat spoils, destroy as directed, and watch that lot of containers closely.

To fasten paper labels on tin, use rubber cement or, if labels are long enough, put glue along one end and wrap label smoothly around the can and lap the glued end over the other.

Occasionally a tin can packed too full bulges at the ends when processing is over. Mark such a can so you will not confuse it later with any can that may bulge because food spoils in storage.

Store, Cool and Dry. Protect jars and cans of meat against bad conditions in storage—heat, freezing, dampness.

Heat is bad because if any bacteria do survive processing the warmth may make them grow and multiply and spoil the food. Hot pipes behind a wall or strong direct sunlight sometimes makes a shelf a hot spot.

Freezing does not spoil canned meat, but it may crack a jar or break a seal and let in bacteria. In an unheated storage place, you can protect canned meat from freezing to some extent by covering with old carpet or a blanket or by wrapping in newspapers.

Dampness is hard on tin cans or metal jar lids.

GUARD AGAINST SPOILAGE

Before opening any glass jar or tin can for use, inspect it well.

If It's a Glass Jar. A bulging lid or rubber ring, gas bubbles, leakage—any of these may be a sign of meat that has spoiled.

If It's a Tin Can. Press the end. Neither end should bulge nor snap back, unless the can was sprung when processed. Both ends should look flat and curved slightly inward. Seams should be tight and clean, with no sign of leaks.

When You Open a Jar or Tin Can. Look for other signs inside a jar or can. Spurting liquid and "off" odor or color are danger signals. A tin can should be smooth and clean inside and show very little corrosion.

If a metal lid of a jar or tin can has turned dark inside, this condition is not harmful. It is simply due to sulfur from the meat.

The broth over canned meats may or may not be jellied. If it is liquid, this is not a sign of spoilage.

It is possible for meat to contain the poison that causes botulism without showing any sign of spoilage. Heating will make the "off" odors of beginning spoilage more noticeable.

If the steam-pressure canner is in perfect order and if every canning recommendation given has been accurately followed, there is no danger of botulism. But as a safety precaution, before tasting, turn out the meat into a pan, add a little water if needed, cover the pan and boil 20 minutes before adding any other ingredients. If any meat smells queer after this, destroy without tasting.

If meat is not to be used at once or if it is to be used in salads or sandwiches, after boiling, chill immediately in a refrigerator or other place as cold.

Burn spoiled canned meat. Or add several spoonfuls of lye to the jar or can and let stand 24 hours—out of reach of children or pets. Then bury food and container. Play safe. Don't give people, animals, or poultry a chance to taste spoiled canned meat.

AVOID SPOILAGE

The chief reasons for spoilage of canned foods are: Use of poor products, improper handling of food, underprocessing, faulty seals, and improper storage. Spoilage should not occur if directions given in this bulletin are carefully followed.

SOME CANNING PROBLEMS AND HOW TO PREVENT THEM

Problem	How to Prevent	Remarks
Product dark at top of container	<p>Preheat food for length of time recommended. Use boiling hot liquid or sirup to completely cover food in jar. Work air bubbles out of jar with a knife blade inserted inside of jar. Complete seal if necessary immediately after processing. Add ascorbic acid to apple sauce, peaches, pears, and sweet corn.</p>	The darkening in itself is not a sign of spoilage.
<p>Change of color throughout jar of food as: Fading Uneven color Different color Darkening</p>	<p>Keep food cool after gathering and before canning. Use fresh young tender products; evenly ripened fruit. Preheat quickly for recommended length of time to stop enzyme action. Avoid iron and copper utensils. Avoid overprocessing. To prevent brownish discoloration in corn, use corn that is neither too young nor too old in which the milk of the corn is still liquid. Do not overprocess.</p>	<p>Pink or blue color in canned apples, pears, and pineapple may be due to chemical changes in coloring matter of fruit. Fruit grown in very dry, hot weather often turns pink. Water in some localities may be cause of color changes. Liquid or sirup dissolves some of the color of fruits or vegetables.</p>
Cloudiness	<p>Avoid bruised, overripe, or overmature products. Preheat and process only as long as recommended. Handle ripe tender products carefully. Use cooking salt instead of table salt. Use good quality sugar. Can peas and beans right after shelling or keep cool in shallow container until canned.</p>	<p>Cloudy liquid or sirup, fruit juice or water will give a cloudy appearance. Cloudiness may be caused by hard water or by starch sediment in overmature vegetables such as beans and peas. Cloudiness may indicate spoilage. Flat sour and botulinum spoilage are often accompanied by cloudiness. Examine to see if there is an "off" odor when opened.</p>

Jars of food not covered with liquid; loss of liquid from jars	<p>Work out air with knife after liquid is added in packing. Add more liquid if necessary to fill in spaces between layers of fruit.</p> <p>Avoid tipping of jars in processing kettle.</p> <p>Maintain constant even pressure during processing of jars of food.</p> <p>At end of processing time remove pressure cooker from source of heat on stove.</p>	Not a sign of spoilage. Food usually dries out and undergoes undesirable changes in color and flavor.
Jars of food not covered with liquid; loss of liquid from jars	<p>Allow natural cooling of pressure cooker and open petcock as soon as zero pressure is reached.</p> <p>Seal jars immediately after removing from processing kettle.</p>	Keep pressure constant.
Floating	<p>Preheat food as recommended to drive out air.</p> <p>Avoid overcooking or overprocessing.</p> <p>Avoid overripe fruit.</p> <p>Fill container full of food and shake down in jar leaving recommended headspace; then cover with liquid.</p> <p>Avoid too heavy a sirup for fruit.</p>	Too much air in cells of food may cause floating. Preheating shrinks the product and makes packing easier.

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Basic Seven Food Groups