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Home

CANNING

of Fruits

and Vegetables



HOME AND GARDEN BULLETIN No. 8
U. S. DEPARTMENT OF AGRICULTURE

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Home CANNING of Fruits and Vegetables



Organisms that cause food spoilage—molds, yeasts, and bacteria—are always present in the air, water, and soil. Enzymes that may cause undesirable changes in flavor, color, and texture are present in raw fruits and vegetables.

When you can fruits and vegetables you heat them hot enough and long enough to destroy spoilage organisms. This heating (or processing) also stops the action of enzymes. Processing is done in either a boiling-water-bath canner or a steam-pressure canner. The kind of canner that should be used depends on the kind of food being canned.

Right Canner for Each Food

For fruits, tomatoes, and pickled vegetables, use a boiling-water-bath canner. You can process these acid foods safely in boiling water.

For all common vegetables except tomatoes, use a steam-pressure canner. To process these low-acid foods safely in a reasonable length of time takes a temperature higher than that of boiling water.

A pressure saucepan equipped with an accurate indicator or gage for controlling pressure at 10 pounds (240° F.) may be used as a steam-pressure canner for vegetables in pint jars or No. 2 tin cans. If you use a pressure saucepan, add 20 minutes to the processing times given in this publication for each vegetable.

Getting Your Equipment Ready

Steam-Pressure Canner

For safe operation of your canner, clean petcock and safety-valve openings by drawing a string or narrow strip of cloth through them. Do this at beginning of canning season and often during the season.

Check pressure gage.—An accurate pressure gage is necessary to get the processing temperatures needed to make food keep.

A weighted gage needs to be thoroughly clean.

A dial gage, old or new, should be checked before the canning season, and also during the season if you use the canner often. Ask your county home demonstration agent, dealer, or manufacturer about checking it.

If your gage is off 5 pounds or more, you'd better get a new one. But if the gage is not more than 4 pounds off, you can correct for it as shown below. As a reminder, tie on the canner a tag stating the reading to use to get the correct pressure.

The food is to be processed at 10 pounds steam pressure; so—

If the gage reads high—

- 1 pound high—process at 11 pounds.
- 2 pounds high—process at 12 pounds.
- 3 pounds high—process at 13 pounds.
- 4 pounds high—process at 14 pounds.

If the gage reads low—

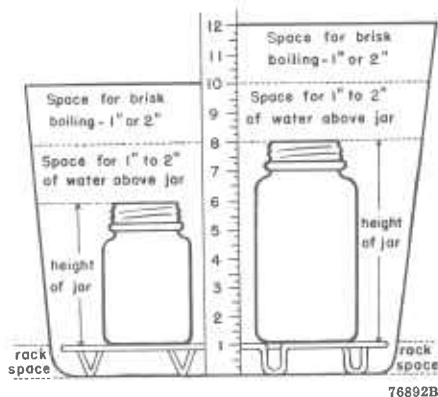
- 1 pound low—process at 9 pounds.
- 2 pounds low—process at 8 pounds.
- 3 pounds low—process at 7 pounds.
- 4 pounds low—process at 6 pounds.

Have canner thoroughly clean.—Wash canner kettle well if you have not used it for some time. Don't put cover in water—wipe it with a soapy cloth, then with a damp, clean cloth. Dry well.

Water-Bath Canner

Water-bath canners are available on the market. Any big metal container may be used as a boiling-water-bath canner if it is deep enough so that the water is well over tops of jars and has space to boil freely. Allow 2 to 4 inches above jar tops for brisk boiling (see sketch). The canner must have a tight-fitting cover and a wire or wooden rack. If the rack has dividers, jars will not touch each other or fall against the sides of the canner during processing.

If a steam-pressure canner is deep enough, you can use it for a water bath. Cover, but do not fasten. Leave pet-cock wide open, so that steam escapes and pressure does not build up inside the canner.



Glass Jars

Be sure all jars and closures are perfect. Discard any with cracks, chips, dents, or rust; defects prevent airtight seals.

Select the size of closure—widemouth or regular—that fits your jars.

Wash glass jars in hot, soapy water and rinse well. Wash and rinse all lids and bands. Metal lids with sealing compound may need boiling or holding in boiling water for a few minutes—follow the manufacturer's directions.

If you use rubber rings, have clean, new rings of the right size for the jars. Don't test by stretching. Wash rings in hot, soapy water. Rinse well.

Tin Cans

Select desired type and size.—Three types of tin cans are used in home canning—plain tin, C-enamel (corn enamel), and R-enamel (sanitary or standard enamel). For most products plain tin cans are satisfactory. Enameled cans are recommended for certain fruits and vegetables to prevent discoloration of food, but they are not necessary for a wholesome product.

The types of cans and the foods for which they are recommended are:

Type of can	Recommended for—
C-enamel.....	Corn, hominy.
R-enamel.....	Beets, red berries, red or black cherries, plums, pumpkin, rhubarb, winter squash.
Plain	All other fruits and vegetables for which canning directions are given in this bulletin.

In this bulletin, directions are given for canning most fruits and vegetables in No. 2 and No. 2½ tin cans. A No. 2 can holds about 2½ cups, and a No. 2½ can about 3½ cups.

Use only cans in good condition.—See that cans, lids, and gaskets are perfect. Discard badly bent, dented, or rusted cans, and lids with damaged gaskets. Keep lids in paper packing until ready to use. The paper protects the lids from dirt and moisture.

Wash cans.—Just before use, wash cans in clean water; drain upside down. Do not wash lids; washing may damage the gaskets. If lids are dusty or dirty, rinse with clean water or wipe with a damp cloth just before you put them on the cans.

Check the sealer.—Make sure the sealer you use is properly adjusted. To test, put a little water into a can, seal it, then submerge can in boiling water for a few seconds. If air bubbles rise from around the can, the seam is not tight. Adjust sealer, following manufacturer's directions.



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A can sealer is needed if tin cans are used.

General Canning Procedure

Selecting Fruits and Vegetables for Canning

Choose fresh, firm fruits and young, tender vegetables. Can them before they lose their freshness. If you must hold them, keep them in a cool, airy place. If you buy fruits and vegetables to can, try to get them from a nearby garden or orchard.

For best quality in the canned product, use only perfect fruits and vegetables. Sort them for size and ripeness; they cook more evenly that way.

Washing

Wash all fruits and vegetables thoroughly, whether or not they are to be pared. Dirt contains some of the bacteria hardest to kill. Wash small lots at a time, under running water or through several changes of water. Lift the food out of the water each time so dirt that has been washed off won't go back on the food. Rinse pan thoroughly between washings. Don't let fruits or vegetables soak; they may lose flavor and food value. Handle them gently to avoid bruising.

Filling Containers

Raw pack or hot pack.—Fruits and vegetables may be packed raw into glass jars or tin cans or preheated and packed hot. In this publication directions for both raw and hot packs are given for most of the foods.

Most raw fruits and vegetables should be packed tightly into the container because they shrink during processing; a few—like corn, lima beans, and peas—should be packed loosely because they expand.

Hot food should be packed fairly loosely. It should be at or near boiling temperature when it is packed.

There should be enough sirup, water, or juice to fill in around the solid food in the container and to cover the food. Food at the top of the container tends to darken if not covered with liquid. It takes from 1/2 to 1 1/2 cups of liquid for a quart glass jar or a No. 2 1/2 tin can.

Head space.—With only a few exceptions, some space should be left between the packed food and the closure. The amount of space to allow at the top of the jar or can is given in the detailed directions for canning each food.

Closing Glass Jars

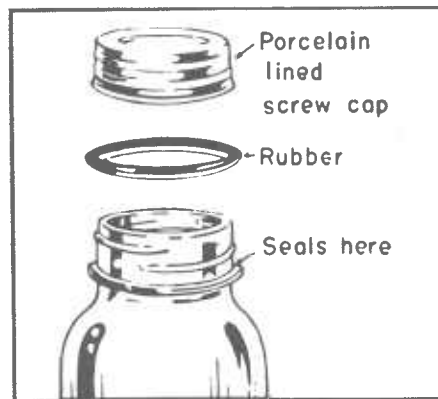
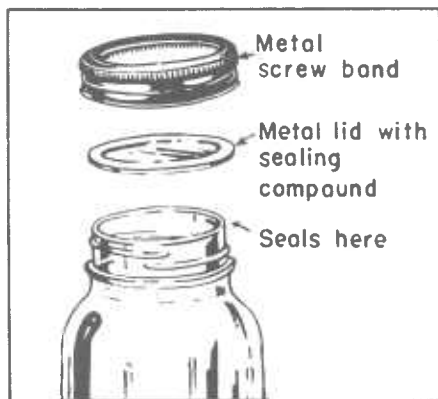
Closures for glass jars are of two main types:

Metal screwband and flat metal lid with sealing compound. To use this type, wipe jar rim clean after produce is packed. Put lid on, with sealing compound next to glass. Screw metal band down tight by hand. When band is tight, this lid has enough give to let air escape during processing. Do not tighten screw band further after taking jar from canner.

Screw bands that are in good condition may be reused. You may remove bands as soon as jars are cool. Metal lids with sealing compound may be used only once.

Porcelain-lined zinc cap with shoulder rubber ring. Fit wet rubber ring down on jar shoulder, but don't stretch unnecessarily. Fill jar; wipe rubber ring and jar rim clean. Then screw cap down firmly and turn it back 1/4 inch. As soon as you take jar from canner, screw cap down tight, to complete seal.

Porcelain-lined zinc caps may be reused as long as they are in good condition. Rubber rings should not be reused.



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Exhausting and Sealing Tin Cans

Tin cans are sealed before processing. The temperature of the food in the cans must be 170° F. or higher when the cans are sealed. Food is heated to this temperature to drive out air so that there will be a good vacuum in the can after

processing and cooling. Removal of air also helps prevent discoloring of canned food and change in flavor.

Food packed raw must be heated in the cans (exhausted) before the cans are sealed. Food packed hot may be sealed without further heating if you are sure the temperature of the food has not dropped below 170° F. To make sure, test with a thermometer, placing the bulb at the center of the can. If the thermometer registers lower than 170°, or if you do not make this test, exhaust the cans.

To exhaust, place open, filled cans on a rack in a kettle in which there is enough boiling water to come to about 2 inches below the tops of the cans. Cover the kettle. Bring water back to boiling. Boil until a thermometer inserted at the center of the can registers 170° F.—or for the length of time given in the directions for the fruit or vegetable you are canning.

Remove cans from the water one at a time, and add boiling packing liquid or water if necessary to bring head space back to the level specified for each product. Place clean lid on filled can. Seal at once.

Processing

Process fruits, tomatoes, and pickled vegetables in a boiling-water-bath canner according to the directions on page 10. Process vegetables in a steam-pressure canner according to the directions on page 16.

Cooling Canned Food

Glass jars.—As you take jars from the canner, complete seals at once if necessary. If liquid boiled out in processing, do not open jar to add more. Seal the jar just as it is.

Cool jars top side up. Give each jar enough room to let air get at all sides. Never set a hot jar on a cold surface; instead set the jars on a rack or on a folded cloth. Keep hot jars away from drafts, but don't slow cooling by covering them.



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Cool jars top side up on a rack, leaving space between jars so air can circulate.



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Cool tin cans in cold water; change water frequently to cool cans quickly.

Tin cans.—Put tin cans in cold, clean water to cool them; change water as needed to cool cans quickly. Take cans out of the water while they are still warm so they will dry in the air. If you stack cans, stagger them so that air can get around them.

Day-After-Canning Jobs

Test the seal on glass jars with porcelain-lined caps by turning each jar partly over in your hands. To test a jar that has a flat metal lid, press center of lid; if lid is down and will not move, jar is sealed. Or tap the center of the lid with a spoon. A clear, ringing sound means a good seal. A dull note does not always mean a poor seal; if there's no leakage, store the jar and check it for spoilage before use.

If you find a leaky jar, use unspoiled food right away. Or can it again; empty the jar, and pack and process food as if it were fresh. Before using jar or lid again check for defects.

When jars are thoroughly cool, take off the screw bands carefully. If a band sticks, covering for a moment with a hot, damp cloth may help loosen it.

Before storing canned food, wipe containers clean. Label to show contents, date, and lot number—if you canned more than one lot in a day.

Wash hands; store them in a dry place.



BN21468

Label jars after they have been cooled.

Storing Canned Food

Canned food should be kept dry and cool, but it should not be subjected to freezing.

Dampness may corrode tin cans and metal lids of glass jars and eventually cause leakage.

Warmth may cause canned food to lose quality. Hot pipes behind a wall sometimes make a shelf or closet too warm for storing food.

Freezing may crack a jar or break a seal and let in bacteria that will cause spoilage. If it does not damage jar or seal, freezing will not make food unsafe to eat. To give food in an unheated place some protection from freezing, cover containers with a blanket or wrap them in paper.

On Guard Against Spoilage

Don't use canned food that shows any sign of spoilage. Look closely at each container before opening it. Bulging can ends, jar lids, or rings, or a leak—these may mean food has spoiled. When you open a container look for other signs—spurting liquid, an off odor, or mold.

It's possible for canned vegetables to contain the poison causing botulism—a serious food poisoning—without showing signs of spoilage. There is no danger of botulism if pressure canner is in perfect order and every canning step is done correctly. But unless you're absolutely sure of your gage and canning methods, boil home-canned vegetables before tasting. Heating usually makes any odor of spoilage more evident.

Bring vegetables to a rolling boil; then cover and boil for at least 10 minutes. Boil spinach and corn 20 minutes. If the food looks spoiled, foams, or has an off odor during heating, destroy it.

Burn spoiled vegetables, or dispose of the food so that it will not be eaten by humans or animals.

How To Can Fruits, Tomatoes, Pickled Vegetables

Fruits, tomatoes, and pickled vegetables are canned according to the general directions on pages 5 to 8, the detailed directions for each food on pages 11 to 16, and the special directions given below that apply only to acid foods.

Points on Packing

Raw pack.—Put cold, raw fruits into container and cover with boiling-hot sirup, juice, or water. Press tomatoes down in the containers so they are covered with their own juice; add no liquid.

Hot pack.—Heat fruits in sirup, in water or steam, or in extracted juice before packing. Juicy fruits and tomatoes may be preheated without added liquid and packed in the juice that cooks out.



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To hot pack fruit, pack heated fruit loosely into jars.



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Cover fruit with boiling liquid before closing jar and processing in boiling-water bath.

Sweetening Fruit

Sugar helps canned fruit hold its shape, color, and flavor. Directions for canning most fruits call for sweetening to be added in the form of sugar sirup. For very juicy fruit packed hot, use sugar without added liquid.

To make sugar sirup.—Mix sugar with water or with juice extracted from some of the fruit. Use a thin, medium, or heavy sirup to suit the sweetness of the fruit and your taste. To make sirup, combine—

4 cups of water or juice....	2 cups sugar....	For 5 cups THIN sirup.
	3 cups sugar....	For 5½ cups MEDIUM sirup.
	4¾ cups sugar...	For 6½ cups HEAVY sirup.

Heat sugar and water or juice together until juice is dissolved. Skim if necessary.

To extract juice.—Crush thoroughly ripe, sound juicy fruit. Heat to simmering (185° to 210° F.) over low heat. Strain through jelly bag or other cloth.

To add sugar direct to fruit.—For juicy fruit to be packed hot, add about ½ cup sugar to each quart of raw, prepared fruit. Heat to simmering (185° to 210° F.) over low heat. Pack fruit in the juice that cooks out.

To add sweetening other than sugar.—You can use light corn sirup or mild-flavored honey to replace as much as half the sugar called for in canning fruit. Do not use brown sugar, or molasses, sorghum, or other strong-flavored sirups; their flavor overpowers the fruit flavor and they may darken the fruit.

Canning Unsweetened Fruit

You may can fruit without sweetening—in its own juice, in extracted juice, or in water. Sugar is not needed to prevent spoilage; processing is the same for unsweetened fruit as for sweetened.

Processing in Boiling-Water Bath

Directions.—Put filled glass jars or tin cans into canner containing hot or boiling water. For raw pack in glass jars have water in canner hot but not boiling; for all other packs have water boiling.

Add boiling water if needed to bring water an inch or two over tops of containers; don't pour boiling water directly on glass jars. Put cover on canner.



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After jars are covered with boiling water, place lid on water-bath canner and bring water quickly back to boiling.

When water in canner comes to a rolling boil, start to count processing time. Boil gently and steadily for time recommended for the food you are canning. Add boiling water during processing if needed to keep containers covered.

Remove containers from the canner immediately when processing time is up.

Processing times.—Follow times carefully. The times given apply only when a specific food is prepared according to detailed directions.

If you live at an altitude of 1,000 feet or more, you have to add to these processing times in canning directions, as follows:

Altitude	Increase in processing time if the time called for is—	
	20 minutes or less	More than 20 minutes
1,000 feet-----	1 minute	2 minutes.
2,000 feet-----	2 minutes	4 minutes.
3,000 feet-----	3 minutes	6 minutes.
4,000 feet-----	4 minutes	8 minutes.
5,000 feet-----	5 minutes	10 minutes.
6,000 feet-----	6 minutes	12 minutes.
7,000 feet-----	7 minutes	14 minutes.
8,000 feet-----	8 minutes	16 minutes.
9,000 feet-----	9 minutes	18 minutes.
10,000 feet-----	10 minutes	20 minutes.

To Figure Yield of Canned Fruit From Fresh

The number of quarts of canned food you can get from a given quantity of fresh fruit depends upon the quality, variety, maturity, and size of the fruit, whether it is whole, in halves, or in slices, and whether it is packed raw or hot.

Generally, the following amounts of fresh fruit or tomatoes (as purchased or picked) make 1 quart of canned food:

	Pounds
Apples.....	2½ to 3
Berries, except strawberries.....	1½ to 3 (1 to 2 quart boxes)
Cherries (canned unpitted).....	2 to 2½
Peaches.....	2 to 3
Pears.....	2 to 3
Plums.....	1½ to 2½
Tomatoes.....	2½ to 3½

In 1 pound there are about 4 medium apples, peaches, or tomatoes; 3 medium pears; 12 medium plums.

Directions for Fruits, Tomatoes, Pickled Vegetables

Apples

Pare and core apples; cut in pieces. To keep fruit from darkening, drop pieces into water containing 2 tablespoons each of salt and vinegar per gallon. Drain, then boil 5 minutes in thin sirup or water.

In glass jars.—Pack hot fruit to ½ inch of top. Cover with hot sirup or water, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 15 minutes

Quart jars..... 20 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot fruit to ¼ inch of top. Fill to top with hot sirup or water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 10 minutes

No. 2½ cans..... 10 minutes

Applesauce

Make applesauce, sweetened or unsweetened. Heat to simmering (185°–210° F.); stir to keep it from sticking.

In glass jars.—Pack hot applesauce to ¼ inch of top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars.....	10 minutes
Quart jars.....	10 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot applesauce to top. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans.....	10 minutes
No. 2½ cans.....	10 minutes

Apricots

Follow method for peaches. Peeling may be omitted.

Beets, Pickled

Cut off beet tops, leaving 1 inch of stem. Also leave root. Wash beets, cover with boiling water, and cook until tender. Remove skins and slice beets. For pickling sirup, use 2 cups vinegar (or 1½ cups vinegar and ½ cup water) to 2 cups sugar. Heat to boiling.

Pack beets in glass jars to ½ inch of top. Add ½ teaspoon salt to pints, 1 teaspoon to quarts. Cover with boiling sirup, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars.....	30 minutes
Quart jars.....	30 minutes

As soon as you remove jars from canner, complete seals if necessary.

Berries, Except Strawberries

● **Raw Pack.**—Wash berries; drain.

In glass jars.—Fill jars to ½ inch of top. For a full pack, shake berries down while filling jars. Cover with

boiling sirup, leaving ½-inch space at top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars.....	10 minutes
Quart jars.....	15 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Fill cans to ¼ inch of top. For a full pack, shake berries down while filling cans. Fill to top with boiling sirup. Exhaust to 170° F. (10 minutes); seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans.....	15 minutes
No. 2½ cans.....	20 minutes

● **Hot Pack.**—(For firm berries)—Wash berries and drain well. Add ½ cup sugar to each quart fruit. Cover pan and bring to boil; shake pan to keep berries from sticking.

In glass jars.—Pack hot berries to ½ inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars.....	10 minutes
Quart jars.....	15 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot berries to top. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans.....	15 minutes
No. 2½ cans.....	20 minutes

Cherries

● **Raw Pack.**—Wash cherries; remove pits, if desired.

In glass jars.—Fill jars to ½ inch of top. For a full pack, shake cherries down while filling jars. Cover with boiling sirup, leaving ½-inch space at top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars.....	20 minutes
Quart jars.....	25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Fill cans to ¼ inch of top. For a full pack, shake cherries down while filling cans. Fill to top

with boiling sirup. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 20 minutes
 No. 2½ cans..... 25 minutes

● **Hot Pack.**—Wash cherries; remove pits, if desired. Add ½ cup sugar to each quart of fruit. Add a little water to unpitted cherries to keep them from sticking while heating. Cover pan and bring to a boil.

In glass jars.—Pack hot to ½ inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 10 minutes
 Quart jars..... 15 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot to top of cans. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 15 minutes
 No. 2½ cans..... 20 minutes

Fruit Juices

Wash; remove pits, if desired, and crush fruit. Heat to simmering (185°–210° F.). Strain through cloth bag. Add sugar, if desired—about 1 cup to 1 gallon juice. Reheat to simmering.

In glass jars.—Fill jars to ½ inch of top with hot juice. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars..... 5 minutes
 Quart jars..... 5 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Fill cans to top with hot juice. Seal at once. Process in boiling-water bath (212° F.)—

No. 2 cans..... 5 minutes
 No. 2½ cans..... 5 minutes

Fruit Purees

Use sound, ripe fruit. Wash; remove pits, if desired. Cut large fruit in pieces. Simmer until soft; add a

little water if needed to keep fruit from sticking. Put through a strainer or food mill. Add sugar to taste. Heat again to simmering (185°–210° F.).

In glass jars.—Pack hot to ½ inch of top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars..... 10 minutes
 Quart jars..... 10 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot to top. Exhaust to 170° F. (about 10 minutes), and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 10 minutes
 No. 2½ cans..... 10 minutes

Peaches

Wash peaches and remove skins. Dipping the fruit in boiling water, then quickly in cold water makes peeling easier. Cut peaches in halves; remove pits. Slice if desired. To prevent fruit from darkening during preparation, drop it into water containing 2 tablespoons each of salt and vinegar per gallon. Drain just before heating or packing raw.



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Peaches can be peeled easily if they are dipped in boiling water, then in cold water.

● **Raw Pack.**—Prepare peaches as directed above.

(Continued on next page)

In glass jars.—Pack raw fruit to ½ inch of top. Cover with boiling sirup, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 25 minutes
 Quart jars..... 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw fruit to ¼ inch of top. Fill to top with boiling sirup. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 30 minutes
 No. 2 ½ cans..... 35 minutes

● **Hot Pack.**—Prepare peaches as directed above. Heat peaches through in hot sirup. If fruit is very juicy you may heat it with sugar, adding no liquid.

In glass jars.—Pack hot fruit to ½ inch of top. Cover with boiling liquid, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 20 minutes
 Quart jars..... 25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot fruit to ¼ inch of top. Fill to top with boiling liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 25 minutes
 No. 2½ cans..... 30 minutes

Pears

Wash pears. Peel, cut in halves, and core. Continue as with peaches, either raw pack or hot pack.

Plums

Wash plums. To can whole, prick skins. Freestone varieties may be halved and pitted.

● **Raw Pack.**—Prepare plums as directed above.

In glass jars.—Pack raw fruit to ½ inch of top. Cover with boiling sirup, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 20 minutes
 Quart jars..... 25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw fruit to ¼ inch of top. Fill to top with boiling sirup. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 15 minutes
 No. 2½ cans..... 20 minutes

● **Hot Pack.**—Prepare plums as directed above. Heat to boiling in sirup or juice. If fruit is very juicy you may heat it with sugar, adding no liquid.

In glass jars.—Pack hot fruit to ½ inch of top. Cover with boiling liquid, leaving ½-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 20 minutes
 Quart jars..... 25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot fruit to ¼ inch of top. Fill to top with boiling liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 15 minutes
 No. 2½ cans..... 20 minutes

Rhubarb

Wash rhubarb and cut into ½-inch pieces. Add ½ cup sugar to each quart rhubarb and let stand to draw out juice. Bring to boiling.

In glass jars.—Pack hot to ½ inch of top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars..... 10 minutes
 Quart jars..... 10 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot to top of cans. Exhaust to 170° F. (about 10

minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 10 minutes
 No. 2½ cans..... 10 minutes

Tomatoes

Use only perfect, ripe tomatoes. To loosen skins, dip into boiling water for about ½ minute; then dip quickly into cold water. Cut out stem ends and peel tomatoes.



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To peel tomatoes, dip them in boiling water, then quickly in cold water to loosen skins.



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To raw pack tomatoes, put peeled tomatoes in jars and press down to fill spaces.

● **Raw Pack.**—Leave tomatoes whole or cut in halves or quarters.

In glass jars.—Pack tomatoes to ½ inch of top, pressing gently to fill spaces. Add no water. Add ½ teaspoon salt to pints; 1 teaspoon to quarts. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars..... 35 minutes
 Quart jars..... 45 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack tomatoes to top of cans, pressing gently to fill spaces. Add no water. Add ½ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Exhaust to 170° F., (about 15 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 45 minutes
 No. 2½ cans..... 55 minutes

● **Hot Pack.**—Quarter peeled tomatoes. Bring to boil; stir to keep tomatoes from sticking.

In glass jars.—Pack boiling-hot tomatoes to ½ inch of top. Add ½ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 10 minutes
 Quart jars..... 10 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack boiling-hot tomatoes to ¼ inch of top. Add no water. Add ½ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans..... 10 minutes
 No. 2½ cans..... 10 minutes

Tomato Juice

Use ripe, juicy tomatoes. Wash, remove stem ends, cut into pieces. Simmer until softened, stirring often. Put through strainer. Add 1 teaspoon salt to each quart juice. Reheat at once just to boiling.

In glass jars.—Fill jars with boiling-hot juice to ½ inch of top. Adjust

(Continued on next page)

jar lids. Process in boiling-water bath (212° F.)—

Pint jars..... 10 minutes
Quart jars..... 10 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Fill cans to top with boiling-hot juice. Seal cans at once. Process in boiling-water bath (212° F.)—

No. 2 cans..... 15 minutes
No. 2½ cans..... 15 minutes

How To Can Vegetables

Can vegetables according to general directions on pages 5 to 8, the detailed directions for each vegetable on pages 18 to 28, and special directions below that apply only to vegetables.

Points on Packing

Raw pack.—Pack cold raw vegetables (except corn, lima beans, and peas) tightly into container and cover with boiling water.

Hot pack.—Preheat vegetables in water or steam. Cover with cooking liquid or boiling water. Cooking liquid is recommended for packing most vegetables because it may contain minerals and vitamins dissolved out of the food. Boiling water is recommended when cooking liquid is dark, gritty, or strong-flavored, and when there isn't enough cooking liquid.

Processing in a Pressure Canner

Use a steam-pressure canner for processing all vegetables except tomatoes and pickled vegetables.

Directions.—Follow the manufacturer's directions for the canner you are using. Here are a few pointers on the use of any steam-pressure canner:

- Put 2 or 3 inches of boiling water in the bottom of the canner; the amount of water to use depends on the size and shape of the canner.

- Set filled glass jars or tin cans on rack in canner so that steam can flow around each container. If two layers of cans or jars are put in, stagger the second layer. Use a rack between layers of glass jars.

- Fasten canner cover securely so that no steam can escape except through vent (petcock or weighted-gage opening).

- Watch until steam pours steadily from vent. Let it escape for 10 minutes or more to drive all air from the canner. Then close petcock or put on weighted gage.

- Let pressure rise to 10 pounds (240° F.). The moment this pressure is reached start counting processing time. Keep pressure constant by regulating heat under the canner. Do not lower pressure by opening petcock. Keep drafts from blowing on canner.

- When processing time is up, remove canner from heat immediately.

With glass jars, let canner stand until pressure is zero. Never try to rush the cooling by pouring cold water over the canner. When pressure registers zero, wait a minute or two, then slowly open petcock or take off weighted gage. Unfasten cover and tilt the far side up so steam escapes away from you. Take jars from canner.



BN22389

To process vegetables, bring pressure in canner up to 10 pounds, then start to count processing time.

With tin cans, release steam in canner as soon as canner is removed from heat by opening petcock or taking off weighted gage. Then take off canner cover and remove cans.

Processing times.—Follow processing times carefully. The times given apply only when a specific food is prepared according to detailed directions.

If you live at an altitude of less than 2,000 feet above sea level, process vegetables at 10 pounds pressure for the times given.

At altitudes above sea level, it takes more than 10 pounds pressure to reach 240° F. If you live at an altitude of 2,000 feet, process vegetables at 11 pounds pressure. At 4,000 feet, use 12 pounds pressure; at 6,000 feet, 13 pounds pressure; at 8,000 feet, 14 pounds pressure; at 10,000 feet, 15 pounds pressure.

A weighted gage may need to be corrected for altitude by the manufacturer.

To Figure Yield of Canned Vegetables From Fresh

The number of quarts of canned food you can get from a given amount of fresh vegetables depends on quality, condition, maturity, and variety of the vegetable, size of pieces, and on the way the vegetable is packed—raw or hot pack.

Generally, the following amounts of fresh vegetables (as purchased or picked) make 1 quart of canned food:

	<i>Pounds</i>		<i>Pounds</i>
Asparagus	2½ to 4½	Okra	1½
Beans, lima, in pods	3 to 5	Peas, green, in pods	3 to 6
Beans, snap	1½ to 2½	Pumpkin or winter squash ..	1½ to 3
Beets, without tops	2 to 3½	Spinach and other greens ..	2 to 6
Carrots, without tops	2 to 3	Squash, summer	2 to 4
Corn, sweet, in husks	3 to 6	Sweetpotatoes	2 to 3

Directions for Vegetables

Asparagus

● **Raw Pack.**—Wash asparagus; trim off scales and tough ends and wash again. Cut into 1-inch pieces.

In glass jars.—Pack asparagus as tightly as possible without crushing to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars----- 25 minutes
 Quart jars----- 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack asparagus as tightly as possible without crushing to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 20 minutes
 No. 2 $\frac{1}{2}$ cans----- 20 minutes

● **Hot Pack.**—Wash asparagus; trim off scales and tough ends and wash again. Cut in 1-inch pieces; cover with boiling water. Boil 2 or 3 minutes.

In glass jars.—Pack hot asparagus loosely to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling-hot cooking liquid, or if liquid contains grit use boiling water. Leave $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars----- 25 minutes
 Quart jars----- 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot asparagus loosely to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling-hot cooking liquid, or if liquid contains

grit use boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 20 minutes
 No. 2 $\frac{1}{2}$ cans----- 20 minutes

Beans, Dry, With Tomato or Molasses Sauce

Sort and wash dry beans (kidney, navy, or yellow eye). Cover with boiling water; boil 2 minutes, remove from heat and let soak 1 hour. Heat to boiling, drain, and save liquid for making sauce.

In glass jars.—Fill jars three-fourths full with hot beans. Add a small piece of salt pork, ham, or bacon. Fill to 1 inch of top with hot sauce (see recipes below). Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars----- 65 minutes
 Quart jars----- 75 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Fill cans three-fourths full with hot beans. Add a small piece of salt pork, ham, or bacon. Fill to $\frac{1}{4}$ inch of top with hot sauce (see recipes below). Exhaust to 170° F. (about 20 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 65 minutes
 No. 2 $\frac{1}{2}$ cans----- 75 minutes

Tomato sauce.—Mix 1 quart tomato juice, 3 tablespoons sugar, 2 teaspoons salt, 1 tablespoon chopped onion, and $\frac{1}{4}$ teaspoon mixture of ground cloves, allspice, mace, and cayenne. Heat to boiling.

Or mix 1 cup tomato catsup with 3 cups of water or soaking liquid from beans and heat to boiling.

Molasses sauce.—Mix 1 quart water or soaking liquid from beans, 3 tablespoons dark molasses, 1 table-

spoon vinegar, 2 teaspoons salt, and $\frac{3}{4}$ teaspoon powdered dry mustard. Heat to boiling.

Beans, Dry, Baked

Soak and boil beans according to directions for beans with sauce.

Place small pieces of salt pork, ham, or bacon in earthenware crock or a pan.

Add beans. Add enough molasses sauce to cover beans. Cover crock and bake 4 to 5 hours at 350° F. (moderate oven). Add water as needed—about every hour.

In glass jars.—Pack hot beans to 1 inch of top. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 80 minutes
Quart jars..... 100 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot beans to $\frac{1}{4}$ inch of top. Exhaust to 170° F. (about 15 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 95 minutes
No. 2 $\frac{1}{2}$ cans..... 115 minutes

Beans, Fresh Lima

Can only young, tender beans.

● **Raw Pack.**—Shell and wash beans.

In glass jars.—Pack raw beans into clean jars. For small-type beans, fill to 1 inch of top of jar for pints and 1 $\frac{1}{2}$ inches for quarts; for large beans, fill to $\frac{3}{4}$ inch of top for pints and 1 $\frac{1}{4}$ inches for quarts. Beans should not be pressed or shaken down. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Fill jar to $\frac{1}{2}$ inch of top with boiling water. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 40 minutes
Quart jars..... 50 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw beans to $\frac{3}{4}$ inch of top; do not shake or press beans down. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill cans to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 40 minutes
No. 2 $\frac{1}{2}$ cans..... 40 minutes

● **Hot Pack.**—Shell the beans, cover with boiling water, and bring to boil.

In glass jars.—Pack hot beans loosely to 1 inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving 1-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 40 minutes
Quart jars..... 50 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot beans loosely to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 40 minutes
No. 2 $\frac{1}{2}$ cans..... 40 minutes

Beans, Snap

● **Raw Pack.**—Wash beans. Trim ends; cut into 1-inch pieces.

In glass jars.—Pack raw beans tightly to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 20 minutes
Quart jars..... 25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw beans tightly to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ tea-

(Continued on next page)

spoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 25 minutes
 No. 2½ cans..... 30 minutes

● **Hot Pack.**—Wash beans. Trim ends; cut into 1-inch pieces. Cover with boiling water; boil 5 minutes.

In glass jars.—Pack hot beans loosely to ½ inch of top. Add ½ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling-hot cook-



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To hot pack snap beans, cover cut beans with boiling water and boil 5 minutes.



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Then pack hot beans loosely in jar and cover with hot cooking liquid before processing in a pressure canner.

ing liquid, leaving ½-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 20 minutes
 Quart jars..... 25 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot beans loosely to ¼ inch of top. Add ½ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Fill to top with boiling-hot cooking liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 25 minutes
 No. 2½ cans..... 30 minutes

Beets

Sort beets for size. Cut off tops, leaving an inch of stem. Also leave root. Wash beets. Cover with boiling water and boil until skins slip easily—15 to 25 minutes, depending on size. Skin and trim. Leave baby beets whole. Cut medium or large beets in ½-inch cubes or slices; halve or quarter very large slices.

In glass jars.—Pack hot beets to ½ inch of top. Add ½ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving ½-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 30 minutes
 Quart jars..... 35 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot beets to ¼ inch of top. Add ½ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 30 minutes
 No. 2½ cans..... 30 minutes

Beets, Pickled

See page 12.

Carrots

● **Raw Pack.**—Wash and scrape carrots. Slice or dice.

In glass jars.—Pack raw carrots tightly into clean jars, to 1 inch of top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Fill jar to $\frac{1}{2}$ inch of top with boiling water. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 25 minutes

Quart jars..... 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw carrots tightly into cans to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill cans to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 25 minutes

No. 2 $\frac{1}{2}$ cans..... 30 minutes

● **Hot Pack.**—Wash and scrape carrots. Slice or dice. Cover with boiling water and bring to boil.

In glass jars.—Pack hot carrots to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling-hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 25 minutes

Quart jars..... 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot carrots to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill with boiling-hot cooking liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 20 minutes

No. 2 $\frac{1}{2}$ cans..... 25 minutes

Corn, Cream-Style

● **Raw Pack.**—Husk corn and remove silk. Wash. Cut corn from cob at about center of kernel and scrape cobs.

In glass jars.—Use pint jars only. Pack corn to 1 $\frac{1}{2}$ inches of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to each jar. Fill to $\frac{1}{2}$ inch of top with boiling water. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 95 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Use No. 2 cans only. Pack corn to $\frac{1}{2}$ inch of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to each can. Fill cans to top with boiling water. Exhaust to 170° F. (about 25 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 105 minutes

● **Hot Pack.**—Husk corn and remove silk. Wash. Cut corn from cob at about center of kernel and scrape cob. To each quart of corn add 1 pint boiling water. Heat to boiling.

In glass jars.—Use pint jars only. Pack hot corn to 1 inch of top. Add $\frac{1}{2}$ teaspoon salt to each jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 85 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Use No. 2 cans only. Pack hot corn to top. Add $\frac{1}{2}$ teaspoon salt to each can. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 105 minutes

Corn, Whole-Kernel

● **Raw Pack.**—Husk corn and remove silk. Wash. Cut from cob at about two-thirds the depth of kernel.

In glass jars.—Pack corn to 1 inch of top; do not shake or press down.

(Continued on next page)



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A nail driven at an angle through the cutting board (see arrow) holds the cob steady and makes it easy to cut corn from the cob.

Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Fill to $\frac{1}{2}$ inch of top with boiling water. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....	55 minutes
Quart jars.....	85 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack corn to $\frac{1}{2}$ inch of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans.....	60 minutes
No. 2 $\frac{1}{2}$ cans.....	60 minutes

● **Hot Pack.**—Husk corn and remove silk. Wash. Cut from cob at about two-thirds the depth of kernel. To each quart of corn add 1 pint boiling water. Heat to boiling.

In glass jars.—Pack hot corn to 1 inch of top and cover with boiling-hot cooking liquid, leaving 1-inch space at top of jar. Or fill to 1 inch of top with mixture of corn and liquid. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....	55 minutes
Quart jars.....	85 minutes

As soon as you remove jars from canner, complete seals if necessary.



76624B

To hot pack corn, put heated corn loosely in C-enamel cans; fill cans with boiling liquid.

In tin cans.—Pack hot corn to $\frac{1}{2}$ inch of top and fill to top with boiling-hot cooking liquid. Or fill to top with mixture of corn and liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 60 minutes
No. 2 $\frac{1}{2}$ cans..... 60 minutes

Hominy

Place 2 quarts of dry field corn in an enameled pan; add 8 quarts of water and 2 ounces of lye. Boil vigorously $\frac{1}{2}$ hour, then allow to stand for 20 minutes. Rinse off the lye with several hot water rinses. Follow with cold water rinses to cool for handling.

Work hominy with the hands until dark tips of kernels are removed (about 5 minutes). Separate the tips from the corn by floating them off in water or by placing the corn in a coarse sieve and washing thoroughly. Add sufficient water to cover hominy about 1 inch, and boil 5 minutes; change water. Repeat 4 times. Then cook until kernels are soft ($\frac{1}{2}$ to $\frac{3}{4}$ hour) and drain. This will make about 6 quarts of hominy.

In glass jars.—Pack hot hominy to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar

lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 60 minutes
Quart jars..... 70 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot hominy to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 60 minutes
No. 2 $\frac{1}{2}$ cans..... 70 minutes

Mushrooms

Trim stems and discolored parts of mushrooms. Soak mushrooms in cold water for 10 minutes to remove adhering soil. Wash in clean water. Leave small mushrooms whole; cut larger ones in halves or quarters. Steam 4 minutes or heat gently for 15 minutes without added liquid in a covered saucepan.

In glass jars.—Pack hot mushrooms to $\frac{1}{2}$ inch of top. Add $\frac{1}{4}$ teaspoon salt to half pints; $\frac{1}{2}$ teaspoon to pints. For better color, add crystalline ascorbic acid— $\frac{1}{16}$ teaspoon to half-pints; $\frac{1}{8}$ teaspoon to pints. Add boiling-hot cooking liquid or boiling water to cover mushrooms, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Half-pint jars..... 30 minutes
Pint jars..... 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot mushrooms to $\frac{1}{4}$ inch of top of cans. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans. For better color, add $\frac{1}{8}$ teaspoon of crystalline ascorbic acid to No. 2 cans. Then fill to top with boiling-hot cooking liquid or boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 30 minutes

Okra

Can only tender pods. Wash; trim. Cook for 1 minute in boiling water. Cut into 1-inch lengths or leave pods whole.

In glass jars.—Pack hot okra to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 25 minutes
Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot okra to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 25 minutes
No. 2 $\frac{1}{2}$ cans..... 35 minutes

Peas, Fresh Blackeye (Cow-peas, Blackeye Beans)

● **Raw Pack.**—Shell and wash blackeye peas.

In glass jars.—Pack raw blackeye peas to $1\frac{1}{2}$ inches of top of pint jars and 2 inches of top of quart jars; do not shake or press peas down. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jars. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 35 minutes
Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw blackeye peas to $\frac{3}{4}$ inch of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Cover with boiling water, leaving $\frac{1}{4}$ -inch space at top of cans. Exhaust to 170° F. (about 10 minutes)

and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 35 minutes
No. 2 $\frac{1}{2}$ cans..... 40 minutes

● **Hot Pack.**—Shell and wash blackeye peas, cover with boiling water, and bring to a rolling boil. Drain.

In glass jars.—Pack hot blackeye peas to $1\frac{1}{4}$ inches of top of pint jars and $1\frac{1}{2}$ inches of top of quart jars; do not shake or press peas down. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 35 minutes
Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot blackeye peas to $\frac{1}{2}$ inch of top; do not shake or press peas down. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Cover with boiling water, leaving $\frac{1}{4}$ -inch space at top of cans. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 30 minutes
No. 2 $\frac{1}{2}$ cans..... 35 minutes

Peas, Fresh Green

● **Raw Pack.**—Shell and wash peas.

In glass jars.—Pack peas to 1 inch of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $1\frac{1}{2}$ inches of space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 40 minutes
Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack peas to $\frac{1}{4}$ inch of top; do not shake or press down. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process at 10 pounds pressure (240° F.)—

No. 2 cans..... 30 minutes
 No. 2 $\frac{1}{2}$ cans..... 35 minutes

● **Hot Pack.**—Shell and wash peas. Cover with boiling water. Bring to boil.

In glass jars.—Pack hot peas loosely to 1 inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving 1-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 40 minutes
 Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot peas loosely to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process at 10 pounds pressure (240° F.)—

No. 2 cans..... 30 minutes
 No. 2 $\frac{1}{2}$ cans..... 35 minutes

Potatoes, Cubed

Wash, pare, and cut potatoes into $\frac{1}{2}$ -inch cubes. Dip cubes in brine (1 teaspoon salt to 1 quart water) to prevent darkening. Drain. Cook for 2 minutes in boiling water, drain.

In glass jars.—Pack hot potatoes to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 35 minutes
 Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot potatoes to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 35 minutes
 No. 2 $\frac{1}{2}$ cans..... 40 minutes

Potatoes, Whole

Use potatoes 1 to 2 $\frac{1}{2}$ inches in diameter. Wash, pare, and cook in boiling water for 10 minutes. Drain.

In glass jars.—Pack hot potatoes to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 30 minutes
 Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot potatoes to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 35 minutes
 No. 2 $\frac{1}{2}$ cans..... 40 minutes

Pumpkin, Cubed

Wash pumpkin, remove seeds, and pare. Cut into 1-inch cubes. Add just enough water to cover; bring to boil.

In glass jars.—Pack hot cubes to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 55 minutes
 Quart jars..... 90 minutes

(Continued on next page)

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot cubes to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with hot cooking liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 50 minutes
No. 2 $\frac{1}{2}$ cans----- 75 minutes

Pumpkin, Strained

Wash pumpkin, remove seeds, and pare. Cut into 1-inch cubes. Steam until tender, about 25 minutes. Put through food mill or strainer. Simmer until heated through; stir to keep pumpkin from sticking to pan.

In glass jars.—Pack hot to $\frac{1}{2}$ inch of top. Add no liquid or salt. Adjust jar lids. Process at 10 pounds pressure (240° F.)—

Pint jars----- 65 minutes
Quart jars----- 80 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot to $\frac{1}{8}$ inch of top. Add no liquid or salt. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 75 minutes
No. 2 $\frac{1}{2}$ cans----- 90 minutes

Spinach (and Other Greens)

Can only freshly picked, tender spinach. Pick over and wash thoroughly. Cut out tough stems and midribs. Place about 2 $\frac{1}{2}$ pounds of spinach in a cheesecloth bag and steam about 10 minutes or until well wilted.

In glass jars.—Pack hot spinach loosely to $\frac{1}{2}$ inch of top. Add $\frac{1}{4}$ teaspoon salt to pints; $\frac{1}{2}$ teaspoon to quarts. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars----- 70 minutes
Quart jars----- 90 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot spinach loosely to $\frac{1}{4}$ inch of top. Add $\frac{1}{4}$ teaspoon salt to No. 2 cans; $\frac{1}{2}$ teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans----- 65 minutes
No. 2 $\frac{1}{2}$ cans----- 75 minutes



78351B

To raw pack squash, pack uniform pieces of squash tightly into jars.



78352B

Cover squash with boiling water just before closing jars and putting in pressure canner.

Squash, Summer

● **Raw Pack.**—Wash but do not pare squash. Trim ends. Cut squash into $\frac{1}{2}$ -inch slices; halve or quarter to make pieces of uniform size.

In glass jars.—Pack raw squash tightly into clean jars to 1 inch of top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Fill jar to $\frac{1}{2}$



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When processing time is up, let pressure in canner drop to zero. Slowly open petcock or take off weighted gage. Unfasten cover, tilting far side up so steam escapes away from you.

inch of top with boiling water. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 25 minutes
 Quart jars..... 30 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack raw squash tightly into cans to ½ inch of top. Add ½ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Fill cans to top with boiling water. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 20 minutes
 No. 2½ cans..... 20 minutes

● **Hot Pack.**—Wash squash and trim ends; do not pare. Cut squash into ½-inch slices; halve or quarter to make pieces of uniform size. Add just enough water to cover. Bring to boil.

In glass jars.—Pack hot squash loosely to ½ inch of top. Add ½ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling-hot cooking liquid, leaving ½-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 30 minutes
 Quart jars..... 40 minutes

As soon as you remove jars from canner, complete seals if necessary.

(Continued on next page)

In tin cans.—Pack hot squash loosely to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling-hot cooking liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 20 minutes
 No. 2 $\frac{1}{2}$ cans..... 20 minutes

Squash, Winter

Follow method for pumpkin.

Sweetpotatoes, Dry Pack

Wash sweetpotatoes. Sort for size. Boil or steam until partially soft (20 to 30 minutes). Skin. Cut in pieces if large.

In glass jars.—Pack hot sweetpotatoes tightly to 1 inch of top, pressing gently to fill spaces. Add no salt or liquid. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 65 minutes
 Quart jars..... 95 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot sweetpotatoes tightly to top of can, pressing

gently to fill spaces. Add no salt or liquid. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 80 minutes
 No. 2 $\frac{1}{2}$ cans..... 95 minutes

Sweetpotatoes, Wet Pack

Wash sweetpotatoes. Sort for size. Boil or steam just until skins slip easily. Skin and cut in pieces.

In glass jars.—Pack hot sweetpotatoes to 1 inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Cover with boiling water or medium sirup, leaving 1-inch space at top of jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars..... 55 minutes
 Quart jars..... 90 minutes

As soon as you remove jars from canner, complete seals if necessary.

In tin cans.—Pack hot sweetpotatoes to $\frac{1}{4}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Fill to top with boiling water or medium sirup. Exhaust to 170° F. (about 10 minutes) and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans..... 70 minutes
 No. 2 $\frac{1}{2}$ cans..... 90 minutes

Questions and Answers

Q. *Is it safe to process foods in the oven?*

A. No, oven canning is dangerous. Jars may explode. The temperature of the food in jars during oven processing does not get high enough to insure destruction of spoilage bacteria in vegetables.

Q. *Why is open-kettle canning not recommended for fruits and vegetables?*

A. In open-kettle canning, food is cooked in an ordinary kettle, then packed into hot jars and sealed without processing. For vegetables, the temperatures obtained in open-kettle canning are not high enough to destroy all the spoilage organisms that may be in the food. Spoilage bacteria may get in when the food is transferred from kettle to jar.

Q. *May a pressure canner be used for processing fruits and tomatoes?*

A. Yes. If it is deep enough it may be used as a water-bath canner (p. 4). Or you may use a pressure canner to process fruits and tomatoes at 0 to 1 pound pressure without having the containers of food completely covered with water. Put water in the canner to the shoulders of the jars; fasten cover. When live steam pours steadily from the open vent, start counting time. Leave vent open and process for the same times given for the boiling-water bath.

Q. *Must glass jars and lids be sterilized by boiling before canning?*

A. No, not when boiling-water bath or pressure-canner method is used. The containers as well as the food are sterilized during processing. But be sure jars and lids are clean.

Q. *Why is liquid sometimes lost from glass jars during processing?*

A. Loss of liquid may be due to packing jars too full, fluctuating pressure in a pressure canner, or lowering pressure too suddenly.

Q. *Should liquid lost during processing be replaced?*

A. No, never open a jar and refill with liquid—this would let in bacteria and you would need to process again. Loss of liquid does not cause food to spoil, though the food above the liquid may darken.

Q. *Is it safe to use canned food if liquid is cloudy?*

A. Cloudy liquid may be a sign of spoilage. But it may be caused by the minerals in hard water, or by starch from overripe vegetables. If liquid is cloudy, boil the food. Do not taste or use any food that foams during heating or has an off odor.

Q. *Why does canned fruit sometimes float in jars?*

A. Fruit may float because pack is too loose or sirup too heavy; or because some air remains in tissues of the fruit after heating and processing.

Q. *Is it safe to can foods without salt?*

A. Yes. Salt is used for flavor only and is not necessary for safe processing.

Q. What makes canned foods change color?

- A. Darkening of foods at the tops of jars may be caused by oxidation due to air in the jars or by too little heating or processing to destroy enzymes. Overprocessing may cause discoloration of foods throughout the containers. Pink and blue colors sometimes seen in canned pears, apples, and peaches are caused by chemical changes in the coloring matter of the fruit.
- Iron and copper from cooking utensils or from water in some localities may cause brown, black, and gray colors in some foods.
- When canned corn turns brown, the discoloring may be due to the variety of corn, to stage of ripeness, to overprocessing, or to copper or iron pans.
- Packing liquid may dissolve coloring materials from the foods. The use of plain tin cans will cause some foods to lose color (p. 4).

Q. Is it safe to eat discolored canned foods?

- A. The color changes noted above do not mean the food is unsafe to eat. However, spoilage may also cause color changes. Any canned food that has an unusual color should be examined carefully before use (p. 8).

Q. Does ascorbic acid help keep fruits and vegetables from darkening?

- A. Yes. The addition of $\frac{1}{4}$ teaspoon of crystalline ascorbic acid (vitamin C) to a quart of fruit or vegetable before it is processed retards oxidation, which is one cause of darkening of canned foods. One teaspoon of crystalline ascorbic acid weighs about 3 grams (or 3,000 milligrams).

Q. Is it all right to use preservatives in home canning?

- A. No. Some canning powders or other chemical preservatives may be harmful.

Q. Why do the undersides of metal lids sometimes discolor?

- A. Natural compounds in some foods corrode the metal and make a brown or black deposit on the underside of the lid. This deposit is harmless.

Q. When canned or frozen fruits are bought in large containers, is it possible to can them in smaller containers?

- A. Any canned or frozen fruit may be heated through, packed, and processed the same length of time as recommended for hot packs. This canned food may be of lower quality than if fruit had been canned when fresh.

Q. Is it safe to leave food in tin cans after opening?

- A. Yes. Food in tin cans needs only to be covered and refrigerated.

Q. Is the processing time the same no matter what kind of range is used?

- A. Processing times and temperatures in this bulletin are for canning in a pressure canner or boiling-water bath with any type of range.

Q. Can fruits and vegetables be canned without heating if aspirin is used?

- A. No. Aspirin cannot be relied on to prevent spoilage or to give satisfactory products. Adequate heat treatment is the only safe procedure.

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MORE INFORMATION

When you preserve food at home, other publications of the Agricultural Research Service listed below may help you. They can be obtained from the Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250. Include your ZIP Code.

Home Canning of Meat and Poultry.....	G106
Home Freezing of Fruits and Vegetables.....	G10
How To Make Jellies, Jams, and Preserves at Home.....	G56
Home Freezing of Poultry.....	G70
Making Pickles and Relishes at Home.....	G92
Freezing Meat and Fish in the Home.....	G93

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