

Home Canning Guide

To can means to heat process food in a glass jar with a lid in place. Processing kills microorganisms -- bacteria, yeasts, and molds that contaminate food and cause food spoilage and/or foodborne illness. Processing can be done in a water bath canner or a pressure canner, depending on the food's acidity.

Acid foods (all the fruits except unacidified figs) are safely processed in a water bath canner. Acidified tomatoes and figs can also be safely processed in a water bath canner. Microorganisms in or on acid foods are easily killed at 212°F (the temperature of boiling water).

Low-acid foods (vegetables and tomatoes that are not acidified) must be processed in a pressure canner. The bacterial that produces botulinum toxin cannot (grow in acid foods but can grow in low acid foods. The bacteria (*Clostridium botulinum*) have spores that survive hours of boiling water temperature. However, these spores are destroyed within a reasonable time at 240°F (the temperature reached inside a pressure canner at 10 pounds pressure).

If low-acid food is processed in a water bath canner, botulinum spores on the food will survive. In the absence of air, a condition found inside a jar after processing, the spores become living bacteria. As the bacteria grow, they form toxin. Eating even a drop of this potent toxin can be fatal to humans and animals. Over 70% of the cases of botulism have been caused by low-acid foods that were improperly canned at home.

To make sure your home canned foods are safe, carefully follow the canning instructions in this bulletin. Process acid food in a water bath canner and low-acid foods in a pressure canner. Never process any foods in a conventional oven, microwave oven, steamer or dishwasher, as these methods do not kill microorganisms that cause food spoilage and/or foodborne illness.

Recommended Canning Equipment

Before each canning, season, assemble and evaluate all canning equipment.

Canning jars. Use only standard canning, jars (also called Mason jars) with the manufacturer's name printed on the side. These jars can withstand the temperature extremes of canning. And, the sealing edge is smooth and flat so lids will seal properly. Never use commercial jars such as mayonnaise and pickle jars for home canning. These jars are not very resistant to temperature extremes; they break easily. Also, lids may not seal on these jars because their sealing edge may be rounded rather than flat. Finally, the neck of the jar may be so short that the screw band will not hold the lid firmly in place during processing. Canning jars must be in perfect condition. Check all jars, new and used, for hairline cracks, chips or nicks on the sealing edge. Such defects can result in breakage or failure to seal.

Canning lids. The only safe way to seal a canning jar is with a two piece canning lid. The set consists of a flat metal lid and a screw

band. The lid has a sealing compound around the edge and is enameled on the under side to prevent food from reaction with the metal. The screw band holds the lid in place during processing. A vacuum seal forms during cooling, after the jar is removed from the canner. Screw bands that are in good condition may be reused, but always use new lids. Do not use screw bands that are bent or badly rusted.

Two types of canners. Use a water bath canner to process acid foods. A water bath canner is a large deep kettle that has a cover and a rack to hold jars. You can also use a big, covered pot that is deep enough to allow water to extend 1 to 2 inches over the tops of the jars with enough room for the water to boil briskly. Also add a rack to keep the jars off the bottom of the pot.

Use a pressure canner to process low acid foods. A pressure canner is a deep, heavy kettle that has a rack on the bottom for jars to stand on, a tight-fitting lid with a gasket, and a pressure gauge. The casket keeps steam from leaking, out around the cover. If the casket is worn, stretched, or hardened, replace it. There are two types of pressure measuring gauges, dial gauge and weighted gauge.

A dial gauge has a needle that moves along a numbered scale to indicate the pressure inside the canner. Each year check the dial gauge, old or new, for accuracy and during the canning, season if heavily used. Call your county Extension Home Economics agent to find out where testing can be done.

A weighted gauge fits over the air vent tube. It permits pressure in the canner to rise to the desired point and then releases excess steam by "jiggling" or "rocking" to keep the pressure from going higher. Weighted gauges do not need testing for accuracy, but they do need to be kept clean. Check the vent tube to be sure it hasn't been bent or damaged during use.

Getting Canning Equipment Ready

Wash canning jars in a dishwasher or in hot soapy water, and rinse well. Keep jars hot by leaving them in the dishwasher or hot water until you are ready to fill them. Jars do not need to be sterilized, as this will be accomplished during processing. Wash and rinse canning lids and screw bands. Follow the manufacturer's directions for preparing lids. They may need to be boiled in water for a few minutes before use.

Preparing Fruits and Vegetables for Processing

Select high quality, unblemished fruits and vegetables for canning. Canning, will not improve quality. Can them as soon as possible after harvesting. If you must hold foods before canning, keep them in the refrigerator. If you buy fruits or vegetables to can, get them fresh from local farmer's markets, roadside stands or pick-your-own farms. Thoroughly wash fruits and vegetables before canning even if they will be peeled. Garden soil contains bacteria. NOTE: Potatoes must be peeled before canning. Potato skins contain a high bacteria count increasing the chance of botulinum toxin formation. Wash by scrubbing with a vegetable brush and rinsing thoroughly. Or, if more practical, soak in water for several minutes. Lift out of the "water so the soil that has

been washed off won't settle back on the food. Peel, pit, and/or slice only as much food as you can process at one time. Some fruits and vegetables (apples, apricots, nectarines, peaches, pears and potatoes) darken when cut. To prevent darkening, keep raw, prepared produce in a solution of 1 teaspoon ascorbic acid to one gallon of cold water. Check among the canners' supplies in the supermarket to get this product.

Sugar and Salt

Sugar helps retain the color, shape and texture of canned fruits. Sugar is usually added as a syrup. To make syrup, pour 4 cups of water into a saucepan and add:

2 cups of sugar to make 5 cups of thin syrup or

3 cups of sugar to make 5 ½ cups of medium syrup or

4 ¼ cups of sugar to make 6 ½ cups of heavy syrup.

Heat until the sugar dissolves. Make 1 to 1 ½ cups of syrup for each quart of fruit. Up to half the sugar used in making syrup can be replaced with light corn syrup or mild-flavored honey. Fruits also can be safely canned without sugar. Pack the fruit in extracted juice, in juice from another fruit (such as bottled apple juice, pineapple juice, or white grape juice) or in water. Salt may be added to vegetables and tomatoes before canning. Since its only function is flavor, it can safely be omitted. Canning fruits and vegetables without adding sugar or salt does not affect processing times or microbiological safety.

Packing Instructions

The two methods of packing, food into canning jars are raw pack and hot pack. Raw pack is packing raw, prepared food into clean, hot jars and then adding hot liquid. Fruits and most vegetables need to be packed tightly because they will shrink during processing. However, raw corn, lima beans, and peas should be packed loosely, as they will expand. For hot pack, heat prepared food to boiling, or partially cook it. It should be packed loosely boiling, hot into clean, hot jars. Hot pack takes more time but has been found to result in higher quality canned foods. For either packing, method, pack acid foods including tomatoes and acidified figs to within ½-inch of the top of the jar. Low acid foods to within 1 inch of the top of the jar. After food is packed into jars, wipe the jar rims clean. Put on the lid with the sealing compound next to the jar rim. Screw the band down firmly so that it is hand-tight. Do not use a far wrench to tighten screw bands. There must be enough "give" for air to escape from the jars during, processing. Process food promptly after packing it into jars and adjusting lids. Processing times are given for pints and quarts. If you are using half pint jars, use processing times for pints. For one-and-one-half pint jars, use processing times for quarts. Fruit juices are the only product that may be canned in half gallon jars.

Canning at Altitudes Above 1,000 Feet

If you live at an altitude of more than 1,000 feet, you will need to modify the processing time for acid foods and the pounds pressure you use to process low-acid foods. The processing instructions presented in this bulletin are for altitudes of 0-1000 feet. To determine your

altitude, contact the North Carolina Geological Survey Office. Their address is: 512 North Salisbury Street, P.O. Box 27687, Raleigh, NC 27611. Their telephone number is 919-733-2423. After determining your altitude, your local extension center can help you to determine changes you need to make to your canning instructions.

Processing in a Water-Bath Canner

Use a water bath canner to process acidified tomatoes, acidified figs and all other fruits. A pressure canner can be used to process acid foods but the quality will not be as good.

Fill the canner half full with water; then cover and heat. For raw-packed food, have the water hot but not boiling. For hot-packed food, have the water boiling

Using a jar lifter, place jars filled with food on the rack in the canner. If necessary, add boiling water to brine, water 1 to 2 inches over the tops of the jars. Do not pour boiling water directly on jars. Cover.

When water comes to a rolling boil, start counting the processing time. Keep water at a boil for the entire processing time. Add more boiling water to keep water 1 to 2 inches above jars.

As soon as the processing time is up, use a jar lifter to remove jars from canner. If liquid boiled out of the jars during processing, do not open them to add more. Do not retighten screw bands, even if they are noticeably loose.

Processing in a Pressure Canner

If you live at an altitude of 0-1000 feet you can process foods in a weighted gauge pressure canner at 10 pounds pressure. If you are using, a dial gauge pressure canner, use 11 pounds pressure. If you live at an altitude more than 2,000 feet you need to increase the pounds pressure at which you process foods. These increases are not given in this bulletin. Contact your county extension center to get this information. If tomato products are acidified, they can be safely processed in a water bath canner. If not, they must be processed in a pressure canner. Here are some pointers for using a pressure canner:

Pour 2 or 3 inches of water in the bottom of the canner and heat to boiling.

Set jars on the rack in the canner. If you have two layers of jars in the canner, use a rack between them and stagger the second layer.

Fasten the canner cover securely so steam cannot escape except through the vent.

Once steam pours steadily from vent, let it escape for 10 minutes to drive all air from the canner. During processing, the canner must be filled with steam, not air, since it is steam that reaches the desired temperature of 240°F.

If the canner has a weighted gauge, start counting the processing time when it jiggles or rocks. The target pressure for this type of canner is 10 pounds pressure. Adjust heat so that gauge jiggles 2 or 3 times a minute or maintains a slow, steady, rocking motion.

If the canner has a dial gauge, bring pressure up quickly to 8 pounds, then adjust the heat to maintain 11 pounds pressure. Start counting the processing times when the gauge registers 11 pounds pressure.

When the processing time is up, turn off the burner. (If you are using, a coal or wood stove, remove canner from heat.) Let the pressure in the canner drop to zero by itself. This may take 45 minutes in a 16-quart canner filled with jars and almost an hour in a 22-quart canner. If the vent is opened before the pressure drops to zero or if the cooling is rushed by running, cold water over the canner, liquid will be lost from the jars.

When the pressure has dropped to zero, open the vent or remove the weighted gauge. (With a weighted gauge canner, pressure is completely reduced if no steam escapes when the gauge is nudged or tilted. If steam spurts out, pressure is not yet down.)

Remove canner cover carefully, tilting it away from your face so that the rising steam cannot burn your face or hands.

Remove jars from canner. If liquid boiled out of jars during processing, do not open jars to add more liquid. Do not retighten screw bands, even if they are noticeably loose.

Place hot jars upright to cool on a towel or rack. Leave space between them so air can circulate. Keep jars out of drafts.

Check Seals

Vacuum seals form as the jars cool. When jars are cool (12 to 24 hours after processing), check the seals. If the lid is depressed or concave and will not move when pressed, it is sealed. If sealed, carefully remove screw bands. If a band sticks, loosen it by covering, it for a moment with a hot, damp cloth. Bands left on jars during storage may rust, making later removal difficult. If you find an unsealed jar, do one of the following:

Refrigerate the food and use it within 2 to 3 days.

Freeze the food. (Drain vegetables before freezing.)

Reprocess the food. Remove lids, empty the contents in to a pan, heat to boiling, pack into clean, hot jars, and put on new lids. Process again for the full time. The eating quality of twice-processed food may be poor. If more than 24 hours have gone by since processing, throw out the food. It might be unsafe to eat.

Label and Store Sealed Jars

Label sealed jars with the processing date. Store them in a cool, dry, dark place. Properly stored canned foods will retain their quality for at least a year. Never store canned foods near hot pipes, a range, a furnace, or in direct sunlight because they lose quality. If stored in a cold place, protect from freezing by wrapping a the jars in newspaper or covering them with a blanket. Canned foods that do freeze may be used as long as freezing does not break the seal. However, they may not be as tasty as properly stored canned foods. If canned foods are kept in a damp place, lids may rust.

Signs of Spoilage

Before using always check canned foods for signs of spoilage-- leakage, bulging lids, or loss of seal. Bulging or loss of seal indicates gas formation inside the jar. Upon opening, the jar, look for spurting liquid. After opening, check for gassiness, cloudy liquid, disagreeable odor, or mold. Never taste food that shows any sign of spoilage. Throw it out; it might be unsafe to eat. Furthermore, never feed this food to animals; it could make them sick.

Cloudy liquid may be a sign of spoilage or be due to minerals in hard water or starch from overripe vegetables. If liquid is cloudy, check for other signs of spoilage. If there are not other signs of spoilage, boil the food. Do not eat any food that foams or has a disagreeable odor during heating.

Always boil home-canned, low-acid foods for 10 minutes before tasting. Do not use this method to make improperly processed food "safe." If enough bacteria is present (due to improper process), it is not certain that ten minutes will destroy the toxin.

Black deposits on the underside of a lid are not a sign of spoilage. The under side of canning lids is coated with enamel. If there are imperfections, such as tiny scratches or pinholes in the enamel, natural compounds in food can react with the metal in the lid to form harmless brown or black deposits.