

Steps for Successful Home Canning

Canning preserves food by using heat to destroy the microorganisms found in food that cause spoilage. When carefully following the guidance in this publication, canning is an ideal method to store seasonal produce for later use.

The recommended methods, equipment, processing times and temperatures in this publication are based on the most current scientific research. For safe, high quality, home-canned food, it is crucial that you follow the research-based recommendations in this guide carefully.

If you are new to canning (or need a refresher) please begin with MU Extension publication GH1451, *Safe Home Canning Basics*, to learn about preventing botulism and other key issues to be aware of when preserving food by home canning.

Selecting the correct canning method

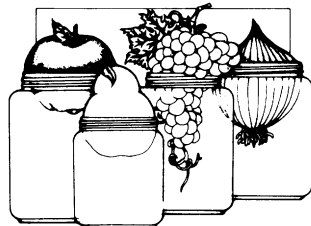
The canning process involves placing foods in jars and heating the product to a temperature that inactivates enzymes and destroys microorganisms that can cause the food to spoil. Air is driven from the jar during the heating process and as it cools, a vacuum seal is formed which prevents air from getting back into product and possibly recontaminating the food. Spoilage poses a high risk of food-borne illness.

There are three safe ways of canning; these are the boiling-water canner method, the steam canner method and the pressure canner method. The recommended method depends on the acidity level of the food being canned.

The boiling-water and steam canner methods are recommended for safely canning high-acid foods, such as fruits, tomatoes, salsa, pickles and sweet spreads. In these methods, jars of food are heated to 212° F by being fully immersed by boiling water or steam.

Pressure canning is the only safe and recommended method of canning low-acid foods, such as vegetables, meats, poultry and fish. In this method, using 2 to 3 inches of water within the pressure canner, jars of food are heated to at least 240° F. This temperature can only be reached in a pressure canner. You must process low-acid foods, such as vegetables, meat, poultry and fish, in a pressure canner to prevent

Quality for Keeps



botulism, an often-fatal type of foodborne illness. Although pressure canners may also be used for processing high-acid foods, such as fruits and tomatoes, boiling-water or steam canners are recommended for these products because they are faster methods and produce a more visually desirable product.

Regardless of the type of canner, most models hold seven quart jars or eight to nine pint jars. Small pressure canners hold a minimum of four quart jars; some large pressure canners hold seven quart jars, and 18 pint jars in two layers.

For home canning purposes, never use a pressure cooker that will not hold at least four quart jars. This same guidance applies even if you are processing pint jars. If the pressure cooker does not have the capacity to hold at least four quarts, it does not have the structural capability to process low-acid foods safely. The pressure canner must also have a jar rack so that jars do not sit on the bottom of the canner.

Use recommended canning jars and lids

Regular and wide-mouth, threaded jars with two-piece self-sealing lids are the recommended choice for home canning (Figure 2). They are available in ½-pint, 12-ounce, pint, 1½-pint, quart and ½-gallon sizes. The regular jar mouth opening is about 2⅜ inches. Wide-mouth jars have openings of about 3 inches, which makes them easier to fill and empty. **Use half-gallon jars only for canning high acid juices.**

When preserving a product in a 12-ounce (1 ½ pint) jar, you will use the recommended processing time required for a quart sized jar.

You will need to use new lids (flats) each time; after the first use the lid will no longer seal effectively. With careful handling, canning jars and screw bands may be reused many times. After jars have cooled and are ready for storage, remove screw bands. Wash and dry screw bands, and store in a dry area. If left on stored jars, screw bands may become hard to remove and often rust, which makes them unsuitable for further use.

When you use jars and lids properly, the results are quality seals and little or no jar breakage.

Before every use, wash empty jars in hot water and detergent and rinse well by hand, or wash in a dishwasher. Unrinsed detergent may cause unnatural flavors and colors in home-canned food. Remove scale or hard-water film on jars by soaking jars several hours in a solution containing 1 cup of vinegar (5 percent acidity) per gallon of water. These washing methods do not sterilize jars.

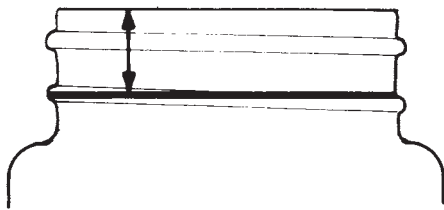


Figure 1. Headspace allows food to expand and forms a vacuum as jars cool.

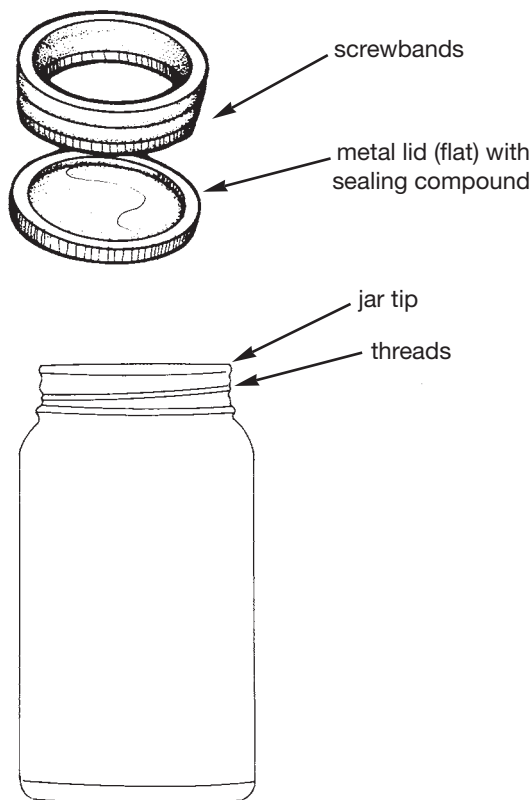


Figure 2. Canning jar with two-piece lid.

- Jars used for low-acid foods that will be processed in a pressure canner do not need to be sterilized.
- Jars for high-acid foods that will be processed for at least 10 minutes in a boiling water or steam canner do not need to be sterilized.
- You only need to sterilize jars that will be used for high-acid products processed for less than 10 minutes.

To sterilize, place empty jars right side up on the rack in a boiling-water canner or large stockpot. Fill the canner and jars with hot (not boiling) water to 1 inch above the tops of the jars. Boil 10 minutes at elevations of less than 1,000 feet. If you live above 1,000 feet, add one minute for each 1,000 feet above sea level. Remove hot, sterilized jars one at a time, and drain. Save the hot water for processing filled jars. You may also use the dishwasher to clean and sterilize empty jars if the dishwasher has a “sterilize” setting.

All jars should be kept hot until filling, regardless of canning method to be used, by allowing them to sit in simmering water. Fill jars with food, adjust lids and process product according to research-based recommendations.

Top with the recommended lid

The two-piece, self-sealing lid is recommended for home canning. It consists of a flat metal lid held in place during processing by a metal screw band. The flat lid is crimped around the bottom edge to form a trough, which is filled with a colored gasket compound. When jars are processed, the lid compound softens and flows slightly to cover the jar-sealing surface, while allowing air to escape from the jar. The sealing compound then forms an airtight seal as the jar cools.

Buy only the quantity of lids you will use in a year, as the sealing compound breaks down during long storage. To ensure a good seal, carefully follow the manufacturer’s directions in preparing lids for use. Examine all metal lids carefully. Do not use old, dented, used or warped lids or lids with gaps or other defects in the sealing gasket.

After filling jars with food, release air bubbles by inserting a flat plastic spatula between the food and the jar. Do not use a metal spatula or knife because these may scratch and weaken the jar. Slowly turn the jar and move the spatula up and down a couple of times to allow air bubbles to escape. Next, adjust the headspace (Figure 1.)

Place the lid on the filled jar, center it and hold it in place with your fingers. Using the other hand, screw the band down until it is fingertip tight, which means the first full resistance is felt using just your fingertips. **Do not use the full force of your hand or wrist or jar tightening utensils when applying the lids.** Today’s lids do not require forceful tightening. Tightening the screw band too tight will prevent the air from escaping, which is necessary during processing. Trapping the air can result in buckled lids that have been deformed by air trying to force its way out. Buckled lids may not seal properly. Overtightening screw bands can also cut through the sealing compound and may cause the lids to not seal properly.

Do not retighten lids after processing jars. As jars cool, the contents in the jar contract, pulling the self-sealing lid firmly against the jar to form a high vacuum.

Recommendations from USDA's National Center for Home Food Preservation (NCHFP) regarding canning lids are currently based on the two-piece metal lid system backed by a body of research documenting how well they work.

It is acknowledged that reusable canning lids have been around for decades. In general, NCHFP can not recommend use of reusable lids simply due to lack of research-based information about their performance. However, there is no data to indicate that these lids would not perform satisfactorily following the manufacturer's instructions explicitly.

Headspace is crucial for safety

Headspace is the unfilled space in the neck of the jar between the food and the lid. Clean the jar rim and threads with a clean damp paper towel to ensure a tight seal. Headspace allows food to expand during processing and forms a vacuum as jars cool. The amount of headspace depends on the type of food being processed. Leave ¼ inch for sweet spreads, ½ inch for fruits and tomatoes and between 1 and 1¼ inches in low-aid foods.

If the jars are filled too full (leaving too little headspace), the contents may boil out during processing. Solids or seeds may be caught under the sealing compound and prevent the jar from sealing.

If too much headspace is left at the top of the jar, the processing time might not be long enough to drive out all the extra air from the top of the jar. This would mean that a tight vacuum seal may not be formed. In addition, the air left inside the jar could cause the food to spoil and discolor.

For the correct headspace, check the processing directions for each specific food in MU Extension food preservation publications.

Processing high-acid foods

Either a boiling-water canner or steam canner will safely can high-acid foods. High-acid foods contain enough acid to block the growth of botulinum bacteria or destroy them more rapidly when heated. The temperature reached in a boiling-water canner or steam canner is effective for destroying yeast and mold.

Boiling-water canners

Boiling-water canners are made of aluminum or porcelain-covered steel. They have a removable perforated or shaped wire rack and lid. The canner must be deep enough so that at least one inch of briskly boiling water will cover the tops of filled, sealed jars during processing. You can also use a

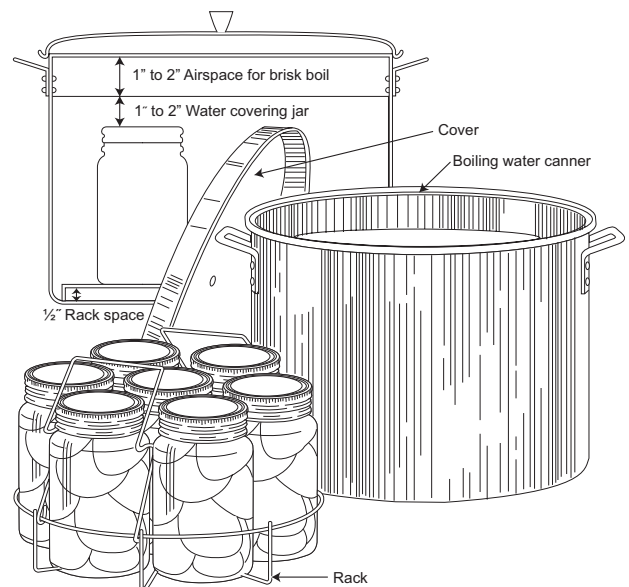
flat-bottomed stockpot with a bottom rack inserted for boiling-water canning. The stockpot used as a canner must be large enough to have plenty of water boiling freely around the jars, and at least 1 to 2 inches over the tops of jars.

Some boiling water canners do not have completely flat bottoms; these will not work well on smooth top ranges. The canner bottom should also be fairly flat for use on electric burners. Either a flat or a ridged bottom may be used on a gas burner. To ensure uniform processing of all jars with an electric range, the canner should be no more than 4 inches wider than the burner (meaning that when centered over the burner, the canner would overhang the burner by no more than 2 inches all the way around).

Boiling-water canning step by step

1. Place the jar rack in the bottom of the canner. Fill the canner half full with clean hot water for a load of pint jars. For other sizes and numbers of jars, you will need to adjust the amount of water so it will be 1 to 2 inches over the top of the filled jars. Prior to adding jars to canner, preheat water to 140 degrees F (water is hot to touch) for raw-packed foods, and to 180 degrees (simmering) for hot-packed foods. See packing guidance as it relates to hot packs versus raw packs on page 7 of this publication.
2. Load filled jars, fitted with lids and screw bands, one at a time into the jar rack. When moving jars with a jar lifter, make sure the jar lifter is securely positioned below the neck of the jar (below the ring band of the lid). Keep the jar upright at all times. Tilting the jar could cause food to spill into the sealing area of the lid. **NOTE:** If you have a shaped wire rack that has handles to hold it on the canner sides above the water, you can load jars onto the rack in the raised position and then use the handles to lower the rack with jars into the water.

Boiling Water Canner



3. Add more boiling water, if needed, so the water level is at least 1 inch above jar tops. Do not pour directly on jar tops, but to the side of the filled jars.
4. Cover the canner with its lid, turn range heat to its highest position until water boils vigorously.
5. As soon as the water begins to briskly boil, start tracking processing time for the minutes required for processing the food. Be sure to use the correct time for your elevation. The heat setting may be lowered as long as a gentle but complete boil is maintained for the entire process time.
6. Add more boiling water, as needed, to keep the water level at least 1 inch above the jars. This may happen if longer processing times are recommended. If the water stops boiling at any time during the process, turn the heat on its highest setting, bring the water back to a vigorous boil. Begin the timing of the process over, from the beginning (using the total original recommended process time).
7. When jars have been processed for the recommended time, turn off the heat and remove the canner lid. Wait five minutes before removing jars.
8. Use a jar lifter to remove the jars one at a time, being careful not to tilt the jars, and place them on a towel or cooling rack. Leave at least 1 inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
9. Let the jars sit undisturbed for 12 to 24 hours before storing. Do not tighten screw bands on the lids; push down on the center of the flat metal lid, or tilt to drain water from top of jar until the jar is completely cooled.
10. Remove screw bands from jars. Test jar lids for a tight seal. Put any unsealed jars in the refrigerator and use within two to three days.
11. Wipe jars and lids to remove any residue. Label jars and store in a cool, dry place out of direct light.

Steam canner

A steam canner is a shallow pan with a dome cover, large enough to fit over quart-sized canning jars. This method uses a small amount of water that produces steam within the canner and around the jars. A steam canner can be used for canning naturally high-acid foods — such as fruits, sweet spreads such as jam and jelly and some tomato products, or acidified foods such as salsa or pickles — as long as all the following criteria are met:

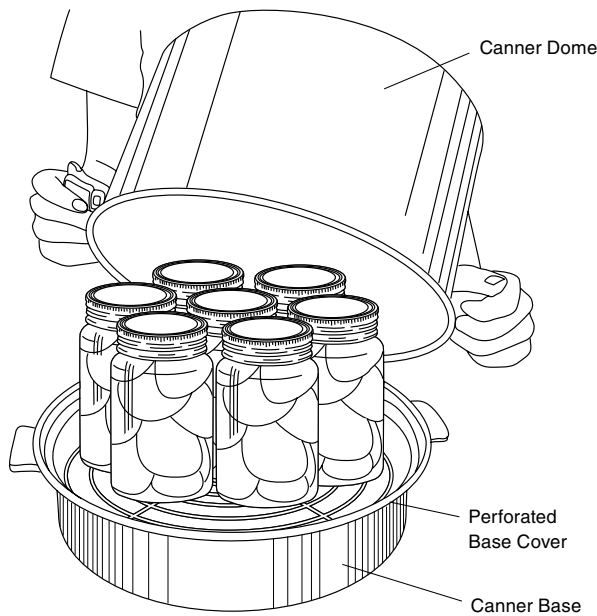
- Foods must be high in acid, with a pH of 4.6 or lower.
- Jars must be heated before filling, and filled with hot liquid regardless if using a raw or hot pack.
- **Processing time must be limited to 45 minutes or less**, including any modification for elevation. The processing time is limited by the amount of water that can be held in the canner base.
- A research-tested recipe developed for a boiling-water canner must be used in conjunction with the steam canner. Steam canners can be used with tested recipes

approved for half-pint, pint or quart jars. **Do not rely on the booklet accompanying a steam canner to provide safe processing time instructions, as this may lead to under processing.**

Steam canners require less water than boiling water canners and so take less time to reach boiling temperature. This also means that a filled steam canner will not be as heavy as a boiling water canner; making it easier to remove from the heat after processing is complete. Steam canners are only recommended for processing using ¼-pint, ½-pint, pint, or quart jars. They can be used fully loaded with jars, half-loaded, or with a single jar.

Steam canning step by step

1. Place the appropriate amount of water in the base of the canner, as indicated in the canner manual. Place the perforated base cover into the canner base and bring water to a low boil.
2. Load filled jars, fitted with lids onto the perforated cover. As long as you follow research-tested methods, the canner can be operated full or nearly empty.
3. Place the dome lid onto the base and over 4 to 5 minutes increase temperature setting of range until a full, steady column of steam rises 8 to 10 inches is evident from the small vent hole at the base of the dome.
Venting is crucial to purge all air from the canner, indicating an efficient transfer of heat.
4. Slowly lower the heat setting of the range to maintain the column of steam and begin timing the process, following the boiling-water canning processing time recommendations, adjusted for elevation.
5. **Do not open the dome lid during processing to add more water**, as that would allow steam to escape and cause the jars to be processed at an incorrect temperature. If the canner boils dry, the food is considered under processed and unsafe to consume.
6. When processing time is complete, turn off the heat source and tilt the canner dome away from you when removing to avoid a steam burn. Wait five minutes before removing the jars.
7. Use a jar lifter to remove the jars one at a time, being careful not to tilt the jars, place them on a towel or cooling rack. Leave at least 1 inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
8. Let the jars sit undisturbed for 12 to 24 hours before storing. Do not tighten screw bands on the lids; push down on the center of the flat metal lid, or tilt to drain water from top of jar until the jar is completely cooled.
9. Remove screw bands from jars. Test jar lids for a tight seal. Put any unsealed jars in the refrigerator and use within two to three days.
10. Wipe jars and lids to remove any residue. Label jars and store in a cool, dry place out of direct light.



Processing low-acid foods

Low-acid foods must be processed with a pressure canner. Do not process low-acid foods in a boiling-water or atmospheric steam canner.

Pressure canners are large kettles with a gasket-sealed, locking lid, fitted with a safety valve, vent and either a dial or weighted gage (Figure 3.) The pressurized steam that builds inside these canner exceeds the temperature of boiling water, which is why they can be used for canning low-acid foods safely.

To be certain you are getting a true reading of the temperature inside your pressure canner, you must:

- Operate the canner at the pressure and processing time according to your elevation. Temperatures inside pressure canners are lower at higher elevations. For more information regarding the effects of elevation, please refer to the MU publication GH451, *Safe Home Canning Basics*.
- Release the air trapped inside the canner by venting the canner. Air trapped inside the canner will lower the temperature; the low-acid food will be under processed and unsafe for consumption. To vent a canner:
 - Leave the vent port uncovered on newer models or manually open petcocks on some older models.
 - Lock on the lid and heat the canner until the water boils and generates a strong funnel of steam that escapes through the petcock or vent port. Time for a full 10 minutes once you see a strong, definite funnel.

- After venting 10 minutes, close the petcock, or place the counterweight or weighted gauge over the vent port to pressurize the canner.
- No matter what the manufacturer's directions say, to be safe, you must vent all types of pressure canners 10 minutes before pressurizing.

- **A dial gauge pressure canner must be checked for accuracy before use each year.** Replace the dial gauge if it reads high or low by more than 2 pounds at 5, 10 or 15 pounds of pressure. Low readings cause over processing, while high readings cause under processing, which is a food safety risk. Dial gauge canners may be checked at most local MU Extension centers.

If your canner has a **weighted gauge** keep these tips in mind:

- The weighted gauge exhausts tiny amounts of air and steam each time it rocks or jiggles during processing..
- The sound and movement of the weight rocking indicates that the canner is maintaining the recommended pressure. Follow the canner manual for guidance on number of movements per minute for the psi recommended. Some weighted gauges rock about two or three times per minute, while others rock slowly throughout the entire processing time.
- Weighted gauges do not become uncalibrated, so they do not have to be checked for accuracy.
- The single disadvantage of weighted-gauge pressure canners is that they cannot process precisely for higher elevations. At elevations above 1,000 feet, they must be operated at higher pressures, for example 10 pounds pressure instead of 5, or 15 pounds pressure instead of 10. MU publications list pounds pressure adjustments when using a weighted gauge pressure canner.

Handle pressure canner lid gaskets (rubber seals) carefully, and clean them according to the manufacturer's directions. Nicked, dried or overstretched gaskets will allow steam leaks during pressurization of canners. Keep gaskets clean between uses. Gaskets on older-model canners may require a light coat of vegetable oil once each year. Gaskets on newer-model canners or replacement gaskets are prelubricated and do not need oiling. To find out if your canner gasket has been prelubricated, check the instruction manual.

Lid safety valves are thin metal inserts or rubber plugs that relieve excess pressure in the canner. Do not pick at or scratch valves while cleaning lids. Use only canners that have the Underwriter's Laboratory (UL) approval for safety.

Replacement gauges and other parts for canners are often available at stores that sell canning equipment or directly from the canner manufacturer.

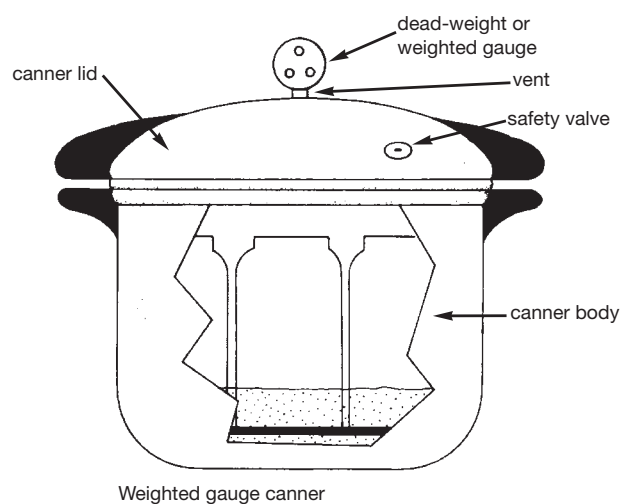
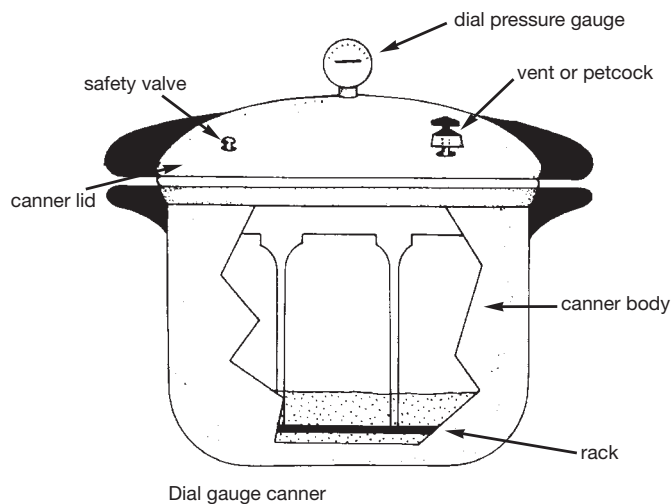


Figure 3. Two types of pressure canners.

Pressure canning step by step

1. Add 2 to 3 inches of hot water in the canner. Raw packed jars can be added at hot to touch water temperature. For hot packed foods, bring water to 180° F (simmering) before loading canner. Be careful not to boil the water or heat it long enough for the depth of water to decrease.
2. Using a jar lifter, load the filled jars, fitted with lids, onto the jar rack without tilting the jars. Leave space between the jars so steam can circulate around each jar. Fasten canner lid securely.
3. Leave weight off of the vent port or open petcock valve.
4. Heat at the highest setting on the range until steam flows freely in a funnel shape from the petcock or vent port. Maintain high heat setting, allowing steam to vent a full 10 minutes.
5. If using a weighted gauge canner, place the gauge on the vent port. If using a dial gauge canner place the weight on the vent port. The canner will begin to pressurize.
 - For a **dial gauge canner**, let the pressure rise quickly to 8 pounds of pressure. Lower heat setting and let the pressure continue to rise to the correct setting.
 - For **weighted gauge canners**, let the canner heat quickly until steam begins to escape from the gauge or the gauge begins to move. Lower heat setting and allow the weighted gauge to jiggle or rock as the manufacturer describes for recommended pounds per pressure.
6. Start timing the recommended process. Regulate heat with a **dial gauge canner** to maintain a steady pressure at or just slightly above the correct pressure setting. Regulate the heat with a **weighted gauge canner** to adjust the rocking movement of the gauge as directed by manufacturer's book. Avoid quick and large pressure changes during processing because this may cause jars to lose liquid
7. If at any time the dial gauge pressure reading or the weighted gauge rocking motion goes below the recommended setting, increase heat and allow the canner to come back to the correct pressure and then start the timing process over again, from the beginning (using the total original recommended process time)
8. When the processing time is complete, remove the canner from heat and let it depressurize. The canner has depressurized when the dial gauge reads 0. A depressurized weighted gauge canner is at 0 pressure when there is no hissing sound or resistance when gently nudged. Be patient, do not force-cool the canner as this may result in food spoilage. Cooling the canner with cold running water or opening the vent port before the canner is fully depressurized will cause liquid to escape from jars and may cause seal failures. Force cooling may also warp the canner lid, causing steam leaks. Standard-size heavy-walled canners require about 30 minutes cooling when loaded with pints and 45 minutes with quarts. Newer thin-walled canners cool more rapidly.
9. After the canner is depressurized, remove the weighted gauge or weight used with a dial gauge canner from the vent port or open the petcock. Wait 10 minutes, then unfasten the lid, and carefully remove it, tilting it away from you so the steam does not burn your face.
10. Use a jar lifter to remove the jars one at a time, being careful not to tilt the jars, and place them on a towel or cooling rack. Leave at least 1 inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
11. Let the jars sit undisturbed for 12 to 24 hours before storing. Do not tighten screw bands on the lids. Do not push down on the center of the flat metal lid, or tilt jar to drain water from top of jar until the jar is completely cooled.

- Remove screw bands from jars. Test jar lids for a tight seal. Put any unsealed jars in the refrigerator and use within two to three days.
- Wipe jars and lids to remove any residue. Label jars and store in a cool, dry place out of direct light.

Testing for quality jar seals

After cooling jars for at least 12 hours, remove the screw bands and test seals using one of these methods:

- Press the middle of the lid, the center indentation should be concave, firm to the touch and will not move up or down. If you are able to press the middle of the lid down and it stays, the jar is not sealed properly. Hold the jar at eye level, and look across the lid. The lid should be concave (curved down slightly in the center). If the center of the lid is either flat or bulging, the jar may not be sealed.
- Tap the lid with the bottom of a teaspoon. If the jar is sealed correctly, it will make a high-pitched ringing sound. A dull thud means either the lid is not sealed or food is touching the underside of the lid. In the case of a dull sound, test seal by another method.

How to reprocess unsealed jars

If a lid fails to seal, you **must reprocess within 24 hours**. Remove the lid, and check the jar-sealing surface for tiny nicks. If necessary, change the jar. Always use a new lid, and reprocess using the same processing time. However the quality of reprocessed food is usually poor.

Instead of reprocessing unsealed jars of food, you can freeze the food product in a freezer safe container leaving 1½ inches of headspace. Single unsealed jars can be refrigerated and should be used within two to three days.

Storing canned foods

For best quality, plan to use home canned foods within one year. Label and date jars, and store them in a clean, cool, dark, dry place — 50 to 70 degrees F is ideal. Do not store jars above 95 degrees F; near hot pipes, a range or a furnace; or in an uninsulated attic or direct sunlight. Under conditions such as these, food will lose quality in a few weeks or months and may spoil. Dampness may corrode metal lids, break seals and allow recontamination and spoilage.

Storing canned foods where they might freeze will not cause spoilage unless jars become unsealed and contaminated. Freezing and thawing will soften food, however. If you must store jars where they may freeze, wrap them in newspapers, place them in heavy cartons and cover the cartons with newspapers and blankets.

Tips for keeping best quality food color and flavor

- Your home-canned products will be only as good as the fresh foods you start with.
- For highest quality safe home canned foods, select the freshest foods possible. Discard diseased and moldy foods. Do not can foods that you would not serve at your table fresh.
- Fruits and vegetables are at peak quality for six to 12 hours after they are picked. Allow apricots, peaches, pears and plums to ripen one or more days between harvest and canning for best results. If you must delay the canning of other fresh produce, keep it refrigerated until you are ready to can; the exception would be tomatoes, store these a room temperature and preserve soon.
- Chill and can fresh red meats and poultry immediately. Do not can meat from diseased animals. Immediately after catching fish, remove entrails and put the fish on ice; can within two days.
- Use the hot-pack method, especially for high-acid foods that will be processed in a boiling-water or steam canner.
- Fill jars while food is still hot, and use the correct headspace specified in recipes.
- Lightly tighten screw bands using **fingertips only**, but not as tightly as possible.
- Store the jars in a cool, dark place (50–70 degrees F).
- Can no more food than you will use within a year.
- Prevent darkening of fruits by using an ascorbic acid (vitamin C) solution. (See next section for more detail).

Prevent produce from darkening

Ascorbic acid helps prevent the discoloration of apples, apricots, peaches, pears, mushrooms and potatoes, and stem-end darkening of cherries and grapes. You can find ascorbic acid in several forms:

- Pure powdered ascorbic acid is available where canning supplies are sold. One level teaspoon of pure powder weighs about 3 grams. Use 1 teaspoon per gallon of water as a treatment solution.
- Vitamin C tablets are economical and available in a variety of locations. Crush and dissolve six 500-milligram tablets in a gallon of water as a treatment solution.
- Commercially prepared mixtures of ascorbic and citric acid are available where canning supplies are sold. Follow the manufacturer's directions.
- Citric acid powder is often sold in supermarkets, but it is less effective in controlling darkening.

Hot pack for quality canned foods

Home-canned food retains quality longer when air is removed from the food before jars are sealed. Hot packing is the best way to remove air. It also “shrinks” food so that more will fit into each jar, helps keep the food from floating, and increases vacuum in sealed jars and improves shelf life.

To hot pack, bring freshly prepared food to a boil and simmer 2 to 5 minutes. Loosely fill jars with the boiled food, followed by boiling liquid.

Hot packing is the preferred pack style for foods processed in a boiling-water or steam canner. At first, the color of hot packed foods may appear no better than that of raw-packed foods, but within a short storage period, both the color and flavor of hot-packed foods will be superior.

In raw packing, jars are filled tightly with freshly prepared, unheated food, followed by boiling liquid. Some foods, especially fruit, will float in the jars. The trapped air may cause the fruit to discolor in as little as two to three months. Raw packing is more suitable for vegetables processed in a pressure canner. The food level and liquid volume of raw-packed jars will be noticeably lower after cooling. Air is exhausted during processing, and food shrinks. If a jar loses excessive liquid during processing, do not open it to add more liquid; use those jars first.

Whether food has been hot packed or raw packed, you should heat the juice, syrup or water added to the foods to boiling before adding it to the jars.

Using a smooth top electric range for canning

With kitchen technology advancements, the smooth cooktop has created some challenges for canning. Follow the manufacturer’s recommendations for your smooth cooktop.

Consider the following:

- The canner bottom must be completely flat to have full contact with the heat source. Some types of boiling-water canners are not recommended for use on smooth cooktops because they have uneven bottoms. Always follow manufacturer recommendations for a cooktop.
- Excessive heat reflecting onto the surface can damage the cooktop. Examples include discoloration, burner damage, cracked glass tops and metal fused to the glass top.
- Many of these cooktops have burners with automatic shutdowns when the heat gets excessive. If the burner shuts off during processing, food can be under processed and unsafe to consume.

References

- White, Athalie, Ann Ford, Elizabeth L. Andress, and Judy A. Harrison. 2014. *So Easy To Preserve*, 6th ed. University of Georgia Cooperative Extension Service.
- Guidelines for Using an Atmospheric Steam Canner for Home Preservation. University of Wisconsin Extension.
- Willmore, Paola, Mark Etzel, Elizabeth Andress, Barbara Ingham. 2015. Home processing of acid foods in atmospheric steam and boiling-water canners. *Food Protection Trends* 35 (3): 150–160.
- National Center for Home Food Preservation. <https://nchfp.uga.edu/>

ALSO FROM MU EXTENSION PUBLICATIONS

- Gh1451 *Safe Home Canning Basics*
- Gh1454 *How to Can Fresh Vegetables*
- Gh1455 *How to Can Fresh Fruit*
- Gh1456 *How to Can Fresh Tomato Products*
- Gh1457 *How to Can Pickled Products*
- Gh1490 *How to Can Meat, Fish and Poultry*
- Gh1501 *Freezing Basics*
- Gh1502 *How to Freeze Fruits*
- Gh1503 *How to Freeze Vegetables*
- Gh1504 *Freezing Meat, Poultry, Fish, eggs and Dairy Products*
- Gh1505 *How to Freeze Home-Prepared Foods*
- Gh1461 *How to Can Sweet Spreads*
- Gh1562 *Introduction to Food Dehydration*
- Gh1563 *How to Dehydrate Foods*
- Gh1564 *How to Use Dehydrated Foods*

extension.missouri.edu | 800-292-0969

Information in this publication is provided purely for educational purposes. No responsibility is assumed for any problems associated with the use of products or services mentioned. No endorsement of products or companies is intended, nor is criticism of unnamed products or companies implied.



Issued in furtherance of the Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension, University of Missouri, Columbia, MO 65211 • MU Extension provides equal opportunity to all participants in extension programs and activities and for all employees and applicants for employment on the basis of their demonstrated ability and competence without discrimination on the basis of race, color, national origin, ancestry, religion, sex, sexual orientation, gender identity, gender expression, age, genetic information, disability or protected veteran status. • 573-882-7216 • extension.missouri.edu