

**EXTENSION**

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Home canning safety

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Home canning preserves food by placing it in jars and heating it for a specific amount of time to destroy microorganisms that can cause illness or spoilage and creates a vacuum seal that protects the food during storage.

Why safe canning matters

Home canning can be safe and rewarding, but each step must be followed carefully. One of the most serious risks associated with improperly canned food is botulism. Botulism is a rare but potentially fatal illness caused by a toxin produced by *Clostridium botulinum* bacteria. The toxin affects the body's nervous system and cannot be seen, smelled or tasted. Even a small amount can cause severe illness or death.

Clostridium botulinum bacteria are found naturally in soil and water and may be present on fresh produce. The bacteria can form spores, which are inactive, heat-resistant structures that help them survive. These spores can survive the temperature of boiling water.

When conditions are favorable, spores can germinate and become active bacterial cells, called vegetative cells. These cells can grow and produce botulinum toxin. The low-oxygen environment inside a sealed jar can provide favorable conditions if the food is low in acid and has not been processed correctly.

Always follow current, research-based canning recommendations from trusted sources, including:

- USDA Complete Guide to Home Canning
- National Center for Home Food Preservation (NCHFP)
- Your local OSU Extension county office

Avoid outdated recipes and untested family methods. Older recipes may not include the processing times, temperatures or other steps now known to be necessary for safety.

Food acidity

The safety of home-canned foods depends on the acidity of the food being preserved. Foods are classified as either high-acid or low-acid based on their pH level, and this determines the canning method that must be used.

High-acid foods

High-acid foods have a pH of 4.6 or lower. They include most fruits, jams, jellies and properly acidified or pickled foods. This level of acidity prevents *Clostridium botulinum* spores from growing and producing toxin. High-acid foods can be safely processed in a boiling water-bath canner when a tested recipe is followed.

Low-acid foods

Low-acid foods have a pH above 4.6. They include vegetables, meats, poultry and seafood. These foods do not contain enough acid to prevent *Clostridium botulinum* spores from growing.

The spores can survive the 212°F temperature reached in boiling water. Low-acid foods must be processed at temperatures of about 240°F to 250°F for the time listed in a tested recipe. A pressure canner is the only recommended home-canning method that can reach and maintain these temperatures. Therefore, a boiling water-bath canner must never be used to process low-acid foods.

Dairy products, including milk, butter and cheese, are also low in acid. However, there are no USDA-recommended methods for canning these foods at home.

Canning equipment

Using the correct equipment and method is essential for safe home canning. A boiling water-bath canner is not safe for low-acid foods. Electric multi-cookers, even those with a “canning” setting, are not recommended for pressure canning because safe processing times have not been established for these appliances.

A pressure canner must be large enough to hold at least four quart-sized jars standing upright on a rack. Smaller pressure cookers and pressure saucepans heat and cool differently and should not be used for pressure canning.

Use mason-type canning jars designed for home canning. These jars are made to withstand the heat used during processing. Do not use decorative jars or jars that are cracked or chipped.

Use two-piece canning lids consisting of a flat metal lid and a screw band. The flat lid forms the seal as the jar cools, while the screw band holds the lid in place during processing. Use a new flat lid each time unless the manufacturer specifically states that the lid is reusable. Screw bands may be reused if they are clean and in good condition.

Before each use, inspect the canner and other equipment:

- Make sure the canner is clean, and the vent pipe is open and free of debris.
- Check the rubber gasket, if the canner has one, to make sure it is flexible and is not cracked, brittle or sticky.
- Have dial gauges tested for accuracy each year. They should also be tested if the gauge is dropped or damaged.
- Follow the canner manufacturer’s directions for inspecting and using the equipment.

Your local Extension office may offer pressure canner dial-gauge testing.

Recipes and instructions

Safe home canning depends on using a current, scientifically tested recipe from a trusted source. Tested recipes are developed to ensure that heat reaches all parts of the food and destroys harmful microorganisms. Follow the recipe exactly for:

- Processing time
- Pressure level
- Jar size
- Packing method, either raw pack or hot pack
- Preparation and size of food pieces
- Headspace
- Ingredients and ingredient amounts

Headspace is the space between the top of the food or liquid and the rim of the jar. Proper headspace allows food to expand during processing and helps a strong vacuum seal form as the jar cools. Follow the headspace listed in the recipe and do not overfill jars.

Do not change ingredient amounts unless the tested recipe says the ingredient is optional. Changes to salt, sugar, vinegar, water, vegetables or other ingredients can affect acidity, water activity, heat movement, food quality or the safety of the preservation method.

This is especially important for mixed foods such as salsa, sauces, soups and pickled products.

Do not

- Reduce the amount of vinegar or other acid
- Use vinegar with a lower acidity than the recipe requires
- Add extra vegetables or other low-acid ingredients

- Add flour, cornstarch, rice, pasta or other thickeners unless instructed
- Increase the jar size
- Use a processing time from one recipe for a different recipe

Some tested recipes identify salt or sugar as optional because it is used only for flavor or quality. Follow the specific directions provided with each recipe.

Altitude adjustments

Altitude affects the temperature at which water boils. At sea level, water boils at 212°F. As elevation increases, water boils at a lower temperature. Without the correct adjustment, canned food may be under processed.

If you live more than 1,000 feet above sea level, adjustments may be required. For boiling water-bath canning, processing time is generally increased. For pressure canning, the amount of pressure may need to be increased. The correct adjustment depends on your altitude, canning method and type of pressure gauge.

Always follow the altitude instructions included with the tested recipe. If you do not know your elevation, contact your local OSU Extension county office.

Cooling and checking jar seals

After processing, place jars upright on a towel or cooling rack. Leave space between the jars so air can circulate. Allow them to cool at room temperature, undisturbed, for 12 to 24 hours.

Do not retighten screw bands, press the lids or turn jars upside down while they are cooling. After 12 to 24 hours, remove the screw bands and check each seal. Recommended methods include:

- Press the center of the lid with your finger. A properly sealed lid should be firm and should not flex up and down.
- Hold the jar at eye level and look across the lid. The center of a properly sealed lid should appear slightly curved downward, or concave.
- Tap the lid with the bottom of a teaspoon. A sealed jar usually makes a clear, ringing sound. An unsealed jar may make a dull sound. However, this method may be less reliable when food touches the underside of the lid.

If a jar did not seal, refrigerate it and use the food promptly, freeze it in a freezer-safe container, or reprocess it within 24 hours using a new lid and the full processing time from the tested recipe.

Storage of home-canned foods

After confirming that jars are sealed, remove the screw bands. Wash and dry the jars, then label each one with the food name and processing date.

Store jars in a clean, cool, dark and dry location. A temperature between 50°F and 70°F is best. Avoid storing jars in direct sunlight or near heat, moisture, hot pipes, furnaces or appliances. For best quality, use home-canned foods within one year.

Before opening a jar, check it carefully. Do not use the food if:

- The jar is leaking
- The lid is loose or bulging
- The seal is broken
- Liquid spurts from the jar when it is opened
- The food has rising bubbles, mold, an unusual color or an unusual odor
- The jar shows other signs of spoilage

Never taste home-canned food to determine whether it is safe. Botulinum toxin cannot be seen, smelled or tasted. If there is any doubt, do not eat the food.

For more information, contact your local Extension office or visit the National Center for Home Food Preservation website.



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