



Prepared by:

Karen Fifield, Joyce McGarry, Wade Syers, Lisa Treiber



Since the science of preserving foods at home continually changes, it is important to stay current with preserving methods. The following food preservation methods are unsafe. The United States Department of Agriculture (USDA) and Michigan State University (MSU) Extension recommend you do not use them.

**Using an open kettle:** Food heated in a kettle and then placed in jars will not kill microorganisms or stop spoilage. Canning food in an open kettle without the final processing method of water bath, atmospheric steam, or pressure will not stop the growth of microorganisms, including yeasts, molds, and pathogens. This method will also create a false safe seal on the jar adding to the potential for botulism.

**Using an oven:** Canning in the oven can cause physical harm as well as create an unsafe product. The dry air in an oven is not a good conductor of even heat. Food canned in an oven will be underprocessed due to the lack of water or steam. The only safe methods of processing

# Unsafe Food Preservation Methods

high- and low-acid foods are the use of a water bath, atmospheric steam canner, or pressure canner. The Mason-type canning jars are not designed for dry heat. There is a high potential for breakage while in the oven or when removed from the heat.

**Using a microwave:** The temperatures in a microwave do not produce an even heat. These different heating properties make it impossible for the microwaved food to reach a safe processing temperature. This has led the USDA Food Safety and Inspection Service (2013) to provide the following guidance, “Do not use the microwave for home canning or sterilizing jars.” Follow the methods described in a researched-based recipe using a water bath canner, atmospheric steam canner, or pressure canner, and approved canning jars and lids. Preserving foods in a microwave oven will not produce a safe, shelf-stable product.

**Using a dishwasher:** Using a dishwasher to can or preserve food is not recommended by any manufacturer. Dishwashers do not reach the 212 °F that water reaches when it boils at sea level. Boiling water is needed to safely process foods. A heat sanitizing cycle’s temperature is between 171 °F and 180 °F. Additionally, when canning foods, you must have a consistent, even heat throughout the entire process. An even heat is not guaranteed in a dishwasher. You can wash, rinse, and keep jars hot in a dishwasher, but *do not* use the dishwasher as a method of processing for home food preservation.

**Making your own recipe:** Home preserving foods is a science. A safe home food preservation recipe will come from a research-based source. To keep foods safe, you must know the pH (acidity), headspace, processing time, and internal temperature that must be reached to kill microorganisms in the food product being processed.

Use only tested recipes to ensure the safety of the product you preserve. MSU Extension recommends visiting the National Center for Home Food Preservation at <https://nchfp.uga.edu/> for information about canning. The website also features the USDA's Complete Guide to Home Canning at [https://nchfp.uga.edu/publications/publications\\_usda.html](https://nchfp.uga.edu/publications/publications_usda.html). Further excellent resources include So Easy to Preserve (sixth edition) at <https://setp.uga.edu/>, the most current Ball Blue Book Guide to Preserving (37th edition), and your state university extension services.

**Using a pressure cooker:** A pressure canner and a pressure cooker have similar names, but they are two different pieces of kitchen equipment with different purposes. A pressure cooker is used to cook food quickly, whereas a pressure canner is used to process food for home preservation. Pressure cookers are smaller than pressure canners and lack a way to control the pressure used. Pressure cookers may also cool too quickly and may not be able to reach safe processing pressures. For more information regarding the differences between pressure cookers and pressure canners, visit [https://nchfp.uga.edu/publications/nchfp/factsheets/electric\\_cookers.html](https://nchfp.uga.edu/publications/nchfp/factsheets/electric_cookers.html).



**Using a flat top stove:** The National Center for Home Food Preservation (2018a) advises checking with the manufacturer before attempting to use a boiling water bath or pressure canner on a flat top stove: <https://nchfp.uga.edu/publications/nchfp/factsheets/smoothtops.html>. Before using a flat top stove, consider that the excessive heat may cause discoloration, damage, or cracking of the stove top. In addition, sliding the heavy canner across the stovetop may cause scratching. Also, some stovetops have an automatic shut-off for extreme heat, causing an interruption of the canning process.

**Using paraffin to seal jams and jellies:** According to current researched-based recipes, the only safe method of preventing mold growth in jams and jellies is to process in a boiling water bath or atmospheric steam canner. The paraffin wax can develop small air holes that allow mold to grow. Mold spores spread throughout soft products such as jams and jellies and cannot be seen or tasted (Andress, 2015). Paraffin is also flammable and can catch on fire when overheated.

**Inverting jam and jelly jars to seal:** Inverting jars to seal is an old method of food preservation that has been found to be unsafe. This method could result in product from inside the jar slipping under the lid and creating an unsafe seal. This is where the lid indents due to the heat, but the seal is jeopardized because of the food particles that may leak between the jar and the lid. For updated safe methods of preserving jams and jellies, refer to the National Center for Home Food Preservation at [https://nchfp.uga.edu/how/can\\_07/prep\\_jam\\_jelly.html](https://nchfp.uga.edu/how/can_07/prep_jam_jelly.html).

**Failing to adjust altitude for recipes:** One factor you will have to take into account when processing food is your altitude. Because water boils at a lower temperature the further it is above sea level, an increase in processing time or pressure will be needed at higher altitudes. To find out the altitude of your cooking site, visit the USGS site at <https://viewer.nationalmap.gov/theme/elevation/>. Then, click on the spot elevation tool and type in the name of the place. For example, “Muskegon, Michigan” returns a result of “Elevation: 616.90 Feet.” The National Center for Home Food Preservation provides some helpful tables for determining process times and

for the rate at which water boils: [https://nchfp.uga.edu/how/general/selecting\\_correct\\_process\\_time.html](https://nchfp.uga.edu/how/general/selecting_correct_process_time.html) and [https://nchfp.uga.edu/how/general/boil\\_water\\_chart.html](https://nchfp.uga.edu/how/general/boil_water_chart.html). For further help adjusting for altitude and guidelines for processing times, see USDA's *Complete Guide to Home Canning*, 2015 revision, at [https://nchfp.uga.edu/publications/publications\\_usda.html](https://nchfp.uga.edu/publications/publications_usda.html).

**Not acidifying tomatoes:** Tomatoes are considered high acid; however, they actually have a pH level just slightly above 4.6, making them close to neutral on the pH scale. Decay or damage caused by bruises, cracks, blossom end rot or insects, and over-ripening can reduce the acidity even more. Tomatoes grown in varying conditions, such as the shade, ripened in shorter hours of daylight, or ripened off the vine tend to be lower in acidity than those vine ripened in direct sunlight. These varied conditions are examples of why it is so important to acidify tomatoes with bottled lemon juice or citric acid before processing. The National Center for Home Food Preservation (2018b) requires adding 2 tablespoons of bottled lemon juice or ½ teaspoon citric acid per quart of tomatoes and 1 tablespoon bottled lemon juice or ¼ teaspoon citric acid per pint directly into each canning jar before filling with tomatoes.



**Using unapproved canning jars and lids:**

Always use two-piece lids and rings for home food preservation. Lids are to be used only once. Several types of lids sell in stores and online with the claim they are reusable; however, currently there is no science-based evidence to support this. Jars also need to be a Mason-type jar that accommodates a two-piece ring and lid. Do not reuse commercial-type food jars (such as for mayonnaise or pasta sauce). These types of one-use jars are not true to size and do not fit the two-piece ring. Canning jars are tempered to withstand the high temperature and pressure that they are subjected to when processing foods. For more information on approved jars and lids, go to the National Center for Home Preservation at [https://nchfp.uga.edu/how/general/recomm\\_jars\\_lids.html](https://nchfp.uga.edu/how/general/recomm_jars_lids.html).

**Not measuring headspace:**

Headspace varies for each type of food being preserved. Directions will be found for each research-based recipe. Filling jars too full may cause the contents to bubble out preventing the jar from sealing. Leaving too much space at the top of the jar may prevent a safe vacuum seal from forming or a discolored product because of excess air. The National Center for Home Food Preservation (n.d.) ([https://nchfp.uga.edu/questions/FAQ\\_canning.html#4](https://nchfp.uga.edu/questions/FAQ_canning.html#4)) recommends using the correct headspace directions from a researched-based recipe.

## References

Andress, E. (2015). *Preserving food: Processing jams and jellies*. University of Georgia Extension. [https://nchfp.uga.edu/publications/uga/2019\\_ProcessingJJ.pdf](https://nchfp.uga.edu/publications/uga/2019_ProcessingJJ.pdf)

National Center for Home Food Preservation. (n.d.). *Frequently asked canning questions*. [https://nchfp.uga.edu/questions/FAQ\\_canning.html#4](https://nchfp.uga.edu/questions/FAQ_canning.html#4)

National Center for Home Food Preservation. (2018a). *Burning issue: Canning on smooth cooktops*. <https://nchfp.uga.edu/publications/nchfp/factsheets/smoothtops.html>

National Center for Home Food Preservation. (2018b). *Selecting, preparing and canning tomatoes*. [https://nchfp.uga.edu/how/can\\_03/tomato\\_intro.html](https://nchfp.uga.edu/how/can_03/tomato_intro.html)

U.S. Department of Agriculture, Food Safety and Inspection Service. (2013). *Microwave ovens and food safety*.

## Resources

*Ball Blue Book Guide to Preserving* (37th edition): <https://www.freshpreserving.com.au/products/ball-blue-book-guide-to-preserving/>

Michigan State University Extension's *Pressure Cookers Versus Pressure Canners*: <https://www.canr.msu.edu/news/pressure-cookers-versus-pressure-canners>

National Center for Home Food Preservation: <https://nchfp.uga.edu/>

U.S. Department of Agriculture's *Complete Guide to Home Canning*: [https://nchfp.uga.edu/publications/publications\\_usda.html](https://nchfp.uga.edu/publications/publications_usda.html)

University of Georgia's *So Easy to Preserve*: <https://setp.uga.edu/>

Find out more about Michigan Fresh at [canr.msu.edu/mi\\_fresh/index](https://canr.msu.edu/mi_fresh/index).