




Water Bath Canning



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COLORADO STATE UNIVERSITY
 EXTENSION






Two Methods of Canning- Depends on pH


- **Water Bath Canner**
 - Used with high acid foods: of 4.6 or lower.
 - Fruits, pickles, jams, jellies
 - Tomatoes need to be acidified
- **Pressure Canner**
 - Used for neutral or low acid foods: pH >4.6
 - Vegetables, meats, poultry, fish

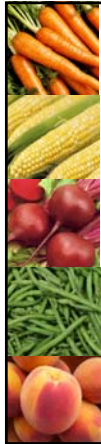






Very High Acid Foods pH 3.0

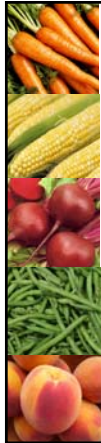
<ul style="list-style-type: none"> • PRODUCTS • Jams, jellies • Conserves • Apple & grape juice • Some pickled products 	<p><u>Type of PROCESSING</u></p> <ul style="list-style-type: none"> • Boiling water canner. • Short processing time (5 min. at <u>sea level</u>). Processing time needs to be adjusted for altitude.
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**High Acid Foods
pH 3.4 to 4.0**

- | | |
|---|---|
| <ul style="list-style-type: none"> • PRODUCTS • Most berry fruits • Apples • Apricots • Grapes • Nectarines • Peaches • Pears • Rhubarb • Some pickled foods | <ul style="list-style-type: none"> • PROCESSING • Boiling water canner. • Time varies 10 - 35 minutes at <u>sea level</u>. Processing time needs to be adjusted for altitude. |
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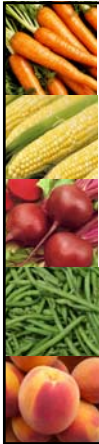
**High Acid Foods
pH 4.0 to 4.6**

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| <ul style="list-style-type: none"> • PRODUCTS • Tomatoes with added lemon juice, vinegar or citric acid • Figs with added lemon juice | <ul style="list-style-type: none"> • PROCESSING • Boiling water canner. • 45 to 85 minute process at sea level. Adjust for Altitude. • Must reach minimum internal temperature of 200°F to destroy mildly heat resistant spore forming bacteria. |
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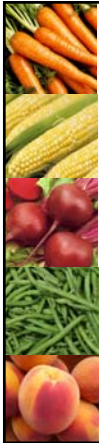
**Low Acid Foods
pH >4.6**

- | | |
|---|---|
| <ul style="list-style-type: none"> • PRODUCTS • Vegetables and vegetable products • Meats • Seafood • Poultry | <ul style="list-style-type: none"> • PROCESSING • <u>Pressure canner.</u> • Must reach internal temperature of 240°F to destroy very heat resistant bacteria. |
|---|---|



Preventing Botulism in Home Canned Foods

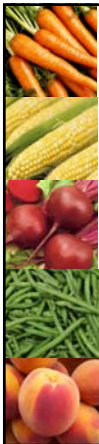
- Yeasts, molds and most bacteria are destroyed at boiling temperatures.
- *C. botulinum* forms heat resistant spores.
- Spores do not germinate in acidic foods (pH \leq 4.6).
- Spores require high temperatures for destruction: 240°F or above.
- ***Pressure canner must be used for low acid foods.***
- Pressure increases temperature:
10 psi = 240°F at sea level.



Water Bath Canning Basics

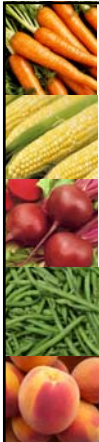
To make sure your home canned foods are safe and good quality - carefully follow safe food handling recommendations and proper canning methods.





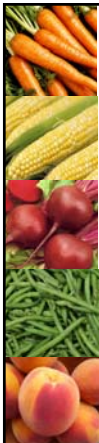
1. Review Tested Recipes and Instructions

- Select only up-to-date recipes.
- Get instructions from reliable source.
- Follow research tested recipes *exactly* for processing methods and processing times. Make appropriate altitude adjustments.



Canning Resources

- Colo State University Extension Office
- So Easy to Preserve
- USDA Complete Guide to Home Canning
- National Center for Home Food Preservation: www.uga.edu/nchfp
- Ball Blue Book (1994 or newer)
- Preserve Smart
<https://apps.chhs.colostate.edu/preservesmart>



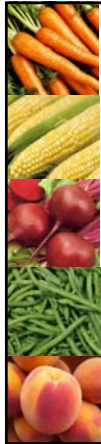
2. Plan Time for Canning

- **Estimate time required for your canning project:**
- Uninterrupted time required for preparation, waiting for water to boil, processing and cool down can be several hours.
- Canning takes more time and energy than other preservation methods.
- Time spent planning and preparing will make canning day go more smoothly and more enjoyable.



3. Select Fresh Ingredients

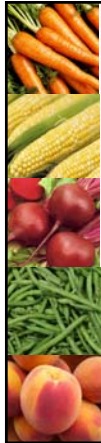
- Can fruits and vegetables at peak of quality – soon after harvest.
- Rinse fruits and vegetables – don't soak. Peel if appropriate.



4. Assemble Equipment

- Water bath canner or large pot with lid and jar rack
- Jars and lids
- Jar lifter
- Lid wand
- Bubble freer
- Funnel
- Timer
- Other general food prep equipment.

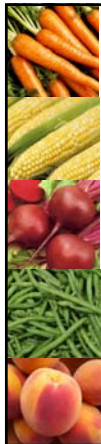




Water Bath Canner



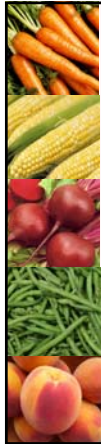
- Aluminum or porcelain-covered steel.
- Removable perforated jar rack.
- Fitted lid.
- Must be deep enough so that at least one inch of boiling water covers jar tops.



Water Bath Canner



- Flat bottom canner must be used on electric coil range and smooth top electric ranges.
- Canner bottom must be in good contact with cooktop in order for efficient heat transfer.
- Canner should be no more than 4 inches wider in diameter than the element on which it is heated.



Electric Water Bath Canners

Ball® FreshTECH Water Bath Canner

- Holds 7 quarts or 8 pints
- Adjustable thermostat
- Glass lid
- Spigot
- Cost: \$100 - 150





Water Bath Canning Equipment

• Jar Lifter



• Lid Wand

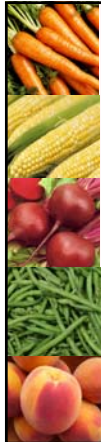


• Bubble Freer



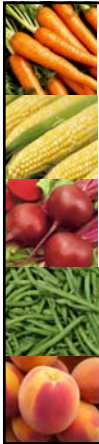
• Funnel





While this may be a possible option for home canning, it is a SAFETY issue!

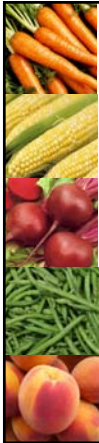




Jars

- Use regular Mason-type home canning jars, can be re-used.
- Inspect jars for defects.
- Wash with hot, soapy water, rinse well or run through dishwasher.
- No-need to sterilize at our altitude due to lengthened water-bath canning times (at least 10 minutes).
- Use only size specified in reliable instructions (or smaller).

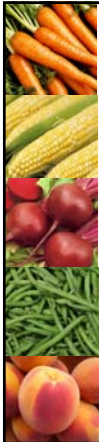




Lids

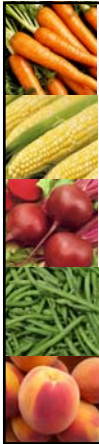
- Use 2 piece lids. (self-sealing metal disc and screw band)
- Only use lid once!
- Follow manufacturer's directions for preparing lids for use.
 - Heat lids in water just below a simmer (180°F) until ready to use. Do not boil.





Steps to Water Bath Canning

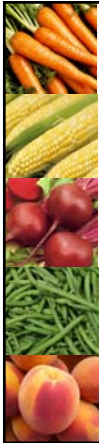




Steps to Water Bath Canning

- **Fill canner halfway with hot water.**
- **Cover and preheat to 140°F for raw-packed or 180°F for hot-packed food.**
 - Raw-packed foods are unheated when placed in jars.
 - Hot-packed foods are heated to boiling and simmered before placing in jars.





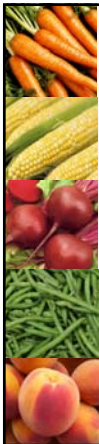
Hot Pack vs. Raw Pack

HOT PACK

Food brought to boil, then simmered 3-5 minutes, packed hot.

RESULT

- More food in jar. Less oxygen results in better color and nutrient retention. Less likely to float.
- Preferred pack style for foods processed in boiling water.



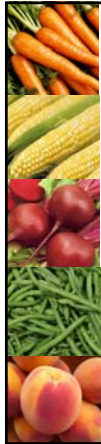
Hot Pack vs. Raw Pack

RAW PACK

Jars filled tightly with freshly prepared, unheated food.

RESULT

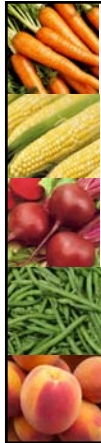
- Less food in jar. Fruit may float. Trapped air may cause discoloration during storage.
- Foods that loose shape in cooking are easier to handle in raw pack.



- Heat jars in hot water - *not boiling* - until ready for use. Keeping jars hot prevents them from breaking when hot food is added.

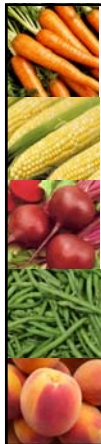
- Prepare lids according to package.
- Place lids in pan, cover with water and heat just below a simmer – *do not boil*.





- Prepare tested recipe using fresh produce and other quality ingredients.



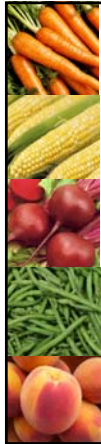


- Remove hot jar from hot water, emptying water from jar.

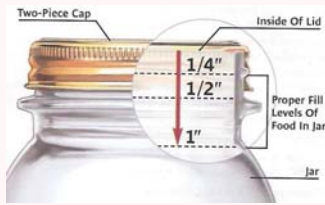


- Fill jars with prepared food leaving headspace recommended in recipe.

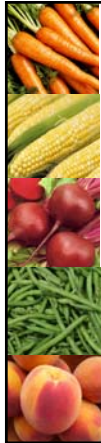




Headspace

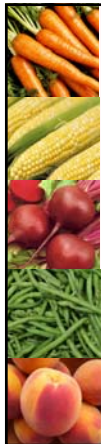


- Measure headspace from the rim of the jar to the top of the food.
- Headspace required depends on type of food, density of product, pack style and processing time.



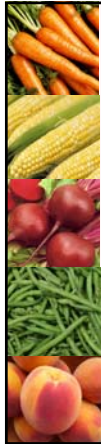
- Remove air bubbles by sliding a rubber spatula or a bubble freer between jar and food.
- Wipe jar rim and threads using a clean damp cloth or paper towel to remove food residue.





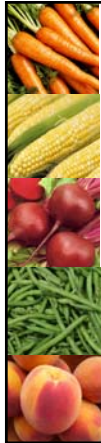
- Center lid on jar allowing sealing compound to come in contact with jar rim.
- Apply band and adjust until it is 'fingertip' tight.





- Place jars in canner without tilting.
- Lower rack with jars into water.
- Make sure water covers jars by 1-2 inches. Add more boiling water if needed.
- Place lid on canner, bring to full rolling boil. Set timer and begin processing time.

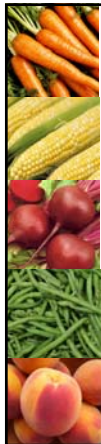




Altitude Adjustment for Water Bath Canning

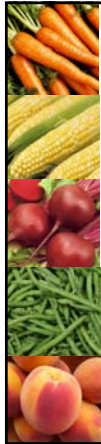
Increase the processing time:

- Processing time at sea level 20 minutes or less:
 - Increase the processing time 1 minute for each 1,000 feet above sea level
- Processing time at sea level more than 20 minutes:
 - Increase by 2 minutes per 1,000 feet
- **OR**, refer to altitude adjustment chart accompanying credible canning recipe.



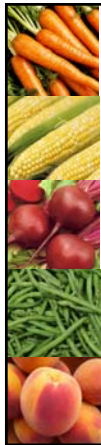
- After processing recommended time, turn off heat, remove lid and wait 5 minutes before removing jars.
- Remove jars from canner without tilting.
- Set upright on a towel, cooling rack or cutting board to prevent jar breakage that can occur from temperature differences.





- Leave jars undisturbed for 12 to 24 hours.
- Screw bands may be loose when jars are removed from canner. Do not retighten bands.
- Check lids for seal by pressing middle of lid. It should not spring up. Hold jar at eye level – lid should be concave.





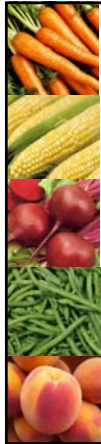
- Remove screw bands.
- Wash jars.
- Label – contents, method, date.
- Store in cool, dry, dark place.
- Best quality if used within 1 year.





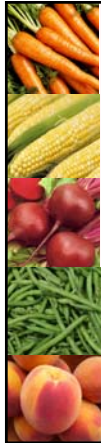
Reprocessing Unsealed Jars

- If less than 24 hours, may reprocess.
 - Use new lid.
 - Use full processing time.
 - May wish to refrigerate or freeze instead of reprocessing for better quality.
- **If more than 24 hours, discard!**



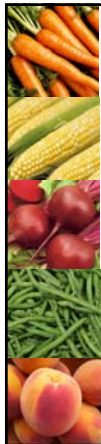
Processes NOT Recommended

- Open kettle canning – temperatures obtained are not high enough to destroy all microorganisms that cause spoilage and foodborne illness.
- Oven, microwave, dishwasher processing – do not prevent risks of spoilage organisms.



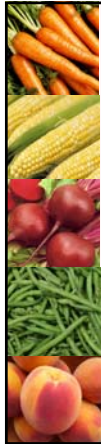
Processes NOT Recommended

- Paraffin or wax seals – allows mold to contaminate and grow into product; mycotoxins produced have been shown to cause cancer in lab animals.
- Glass and zinc caps used with rubber rings – often fail to seal properly.
- Tattler lids – reusable plastic; BPA free; NCHFP research ongoing to determine safe use.



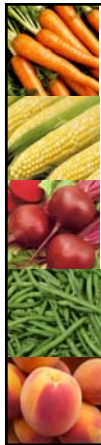
Signs of Spoilage

- Incorrectly processed low acid food, even if it appears normal.
- Cloudy canning liquid (may also be caused by salt additives or minerals in water).
- Strange odor.
- Mold growth.
- Jar not sealed.



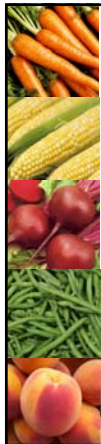
Is the food safe to eat?

- Was it canned by up-to-date tested recipe?
- Instructions followed explicitly?
- Processing time adjusted for altitude?
- Is jar sealed?
- Are there no obvious signs of spoilage?



Yes You Can!





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