



# Canning Foods At Home – The Basics



The University of Georgia

# Basics of Safe Home Canning

- High quality food is selected and prepared according to specific directions following a USDA tested recommendation.
- Food is placed in a canning or MASON-type jar with a 2-piece lid and is heated to a temperature that destroys microorganisms.
- Heat also inactivates enzymes that can cause changes in color, flavor and texture.
- Air is driven from the jar during heating. As the jar cools, a vacuum seal is formed.



# Vacuum Seal

- Holds the lid on the jar.
- Prevents recontamination of the food.
- Prevents air from drying out the food.





# Canning Method

- The canning method that is approved for a food depends on the type of food.
- Foods are divided into two main categories:
  - those that contain acid (called “acid foods”)
  - those that have very little or no acid (called “low acid” foods)

# Acid Foods

pH  $\leq$  4.6 (measure of acidity)

- Generally all fruits
- Tomatoes and figs are borderline – (specific amounts of citric acid or lemon juice must be added before canning to acidify)
- Sauerkraut
- Foods to which large amounts of acid are added (pickles)







# Low Acid Foods

pH > 4.6

- Generally all vegetables
- Meats
- Poultry
- Seafood
- Soups
- Mixtures of acid and low acid foods (spaghetti sauce – meat, vegetables and tomatoes)

# Two Approved Methods of Canning Foods At Home

- 1) Boiling Water Canning (212°F at sea level)
  - Used for acid foods
- 2) Pressure Canning (at least 240°F)
  - Used for low acid foods (and mixtures of acid and low acid foods)





Why Do Low Acid Foods Have to be Pressure Canned to be Safe?

## Clostridium botulinum!

- C. botulinum forms protective, heat-resistant spores.
- Spores require higher temperatures for destruction in a reasonable period of time (usually 240°F or above at sea level)



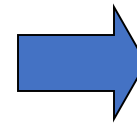
# What Can Happen If Low Acid Foods Are Not Pressure Canned?

When conditions become favorable:

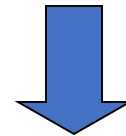
40 – 140 degrees F

High moisture

No air in jar



**Spores germinate  
and form toxin-  
producing cells**



**Botulism**






- \* Food can contain toxin without showing signs.
- \* Symptoms usually appear within 12 to 72 hours:
  - Digestive upset (in some cases)
  - Blurred, double vision
  - Difficulty swallowing, speaking and breathing
  - Death

# Preventing Botulism

## Home Canned Foods

- Spores won't germinate in acid environments.
- Spores are destroyed when heated long enough at a specific temperature.
- USDA recommends a canner temperature of at least 240°F at sea level for canning low acid foods.
- Pressure canner must be used for all low acid foods.





# Important “Musts” for Canning

- Food must be properly prepared and processed the correct amount of time.
- Canner must be accurate and operated correctly.
- You may need to make altitude adjustments, depending on your altitude.
- Directions from a reputable source must be followed (USDA, Cooperative Extension, National Center for Home Food Preservation ([www.homefoodpreservation.com](http://www.homefoodpreservation.com)), Ball Blue Book, *So Easy To Preserve*).
- Up-to-date methods and information should be used; beware of “granny’s method.”

# How Canning Process Times Are Determined

- Foods are prepared by a specific procedure.
- The length of time it takes to adequately heat the coldest spot in the jar is determined.
- Size of the jar, size of the food, consistency of the canning liquid, etc. all have an effect on how heat penetrates through the product.





# What Does This Mean???

\* Follow directions exactly. The following slow heat penetration:

- Adding extra sugar or fat.
- Having food pieces larger than called for in directions.
- Adding thickeners.

\* Note: Heat-up and cool-down in pressure canners is counted toward heat penetration so don't quick-cool the canner!



# Methods of Pack

## Raw Pack

- For foods that lose shape when cooked.
- Place raw food directly in jars. Boiling hot liquid is then poured over the food.
- Pack firmly, don't crush.
- Add jars carefully to canner.



# Hot Pack

- Preferred method for most foods.
- Food is cooked in liquid before packing. Cooking liquid poured over food in jar.
- Fewer jars needed.
- Less floating.
- Better color and flavor.
- Easier to pack, foods pliable.



**If directions only list hot pack instructions, then hot pack!**

# Headspace



\* Space in the jar between the inside of the lid and the top of the food or its liquid. Check directions for the correct headspace.

\* Usually:

- 1/4" jellied fruit products
- 1/2" fruits, tomatoes and pickles
- 1" to 1-1/4" low acid foods

# Headspace

- \* Too little
  - Food may bubble out during processing.
  - Deposit on rim may prevent proper sealing.
- \* Too much
  - Food at the top is likely to discolor.
  - Jar may not seal properly, because not all air may be forced from jar during process.





# Jars and Lids

- \* Wash canning jars; don't use if nicked or scratched – keep hot until used.
- \* Prepare 2-piece canning lids and ring bands by package instructions.
- \* Remove air bubbles (plastic knife).
- \* Wipe jar rims with wet, clean cloth.
- \* Adjust two-piece lids; tighten fingertip-tight.





# Processing Time

- \* Each food has its own processing time.

**Follow directions carefully!**

- \* Time differs with size of jar.
- \* Too Little
  - Spoilage

# Boiling Water Canning Procedures



- \* Have about 6" of water simmering or hot in canner.
  - Hot packed jars - simmering water
  - Raw packed jars - hot water
- \* Place jars on rack in canner.
- \* Water must be over the tops of the jars by at least one to two inches.

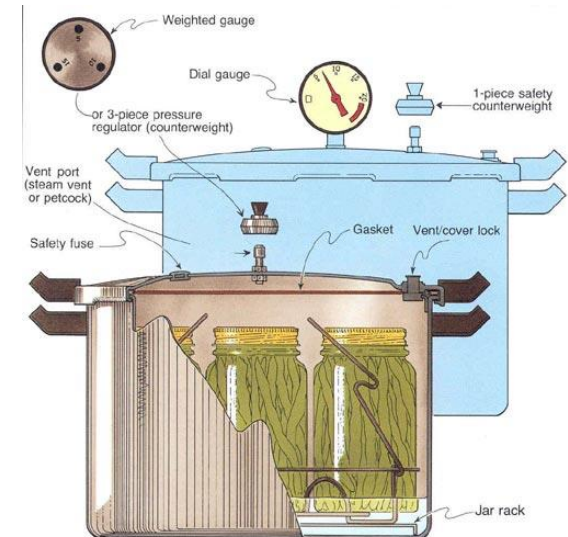
## Boiling Water Canning Procedures Continued...

- \* Add more hot or boiling water if necessary.
- \* Begin timing the process when a full boil is reached.
- \* Adjust for altitude if over 1000 ft.
- \* After processing time is complete, turn off canner, remove lid and wait 5 minutes before removing jars.
- \* Remove jars straight up out of canner and place on padded surface away from drafts.
- \* Cool 12 to 24 hours, undisturbed.
- \* Check seals.
- \* Remove rings.
- \* Wipe off jars before storing in a cool, dry, dark place.



# Pressure Canning Procedures

- \* Have 2" to 3" of water simmering or hot in canner.
  - Hot packed jars - simmering water
  - Raw packed jars - hot water
- \* Place jars on rack in canner.
- \* Put lid on canner with weight off or petcock open.







## Pressure Canning Procedures – continued...

- \* Exhaust 10 minutes – steady stream of steam escaping.
- \* Close vent or petcock.
- \* Count time when correct pressure is reached.
- \* Adjust for altitude, if needed.
- \* Turn off heat at end of processing.
- \* Let pressure drop to 0.



## Pressure Canning Procedures – continued...

- Wait about 2 minutes after pressure drops to 0 psig to make sure no pressure remains.  
(For some canners, check that locks in handles are released.)
- Remove weight or open petcock. Wait 10 min.
- Open canner. (Be careful of steam!)
- Remove jars to padded surface or rack.
- Cool jars 12 to 24 hours, undisturbed.
- Check that jars have sealed.



# Testing for Seals

- \* Listen for “pop”.
- \* Lid curved inward, won’t move when pressed.
- \* Clear ringing sound when tapped.



# Storing Home Canned Food

- Store in a cool, dry, dark place.
- Avoid temperature extremes.
- Use within 1 year for best quality.



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