Canning Foods At Home – The Basics

Presented by:
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Family & Community Health Sciences

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Materials created by:
Cooperative Extension
The University of Georgia

Basics of Safe Home Canning

Why Preserve Food at Home?
• Save on grocery bills
• Support sustainable lifestyles
• Manage your own/family’s nutrition
• Enjoy creative recipes and cooking

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 < 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)

Acidity of Tomatoes

- Acidity varies by variety, growing conditions & stage of maturity
- Use slightly under ripe or firm ripe tomatoes, not overripe.
- Add acid to all tomato products prior to canning.
  - Pints: Add 1 tablespoon bottled lemon juice or ¼ teaspoon citric acid
  - Quarts: Add 2 tablespoons bottled lemon juice or ½ teaspoon citric acid

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 that can grow in low-oxygen conditions.
- 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

* 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
* CDC reports 70 non-commercial food cases between 1990-2000; 44% were home-canned vegetables
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), 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!

Recipe Comparison No. 1

Apple Butter
(aabout 4 1/2 half-pint jars)

- 8 pounds apples
- 2 cups cider
- 2 cups sugar
- 2 cups white sugar
- 26 cups packed brown sugar
- 2 teaspoon ground cinnamon
- 1 teaspoon ground cloves

Wash, remove stems, quarter and core fruit. Cook slowly in cider and vinegar until soft. Press fruit through a colander, add milk, or strainer. Cook fruit pulp with sugar and spices, stirring frequently. To test for doneness, remove a spoonful and hold it away from steam for 2 minutes. It is done if the butter remains molded on the spoon. Another way to determine when the butter is cooked sufficiently is to spread a small quantity onto a plate. When a skin of the liquid does not separate around the edge of the butter, it is ready for processing. Meanwhile, sterilize canning jars. Pour hot butter into hot half-pint or pint jars, leaving 1/4 inch headspace. Wipe jar rims and adjust lids. Process 5 minutes in a boiling water bath.

Tested Recipe from “No Easy to Preserve”, Univ. of GA Cooperative Extension, 2006

Recipe Comparison No. 1

CROCKPOT APPLEBUTTER

Printed fr

- Apples, (a cooking apple)
- Sugar (1 c. of sugar for every cup of applesauce)
- Cinnamon
- Canning jars
- Lids & rings

Clean, core and peel apples, then cook apples and make applesauce. Put applesauce and sugar into crockpot and cook slowly all day. When it is done (the applesauce will turn brown), add cinnamon to taste (approximately 4 drops) and stir. Put applebutter in sterile canning jar. Boil lids and put onto jars than put rings on. It should seal.
Recipe Comparison No. 2

**Stewed Tomatoes**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 cups</td>
<td>chopped tomatoes</td>
</tr>
<tr>
<td>1/4 c</td>
<td>chopped green pepper</td>
</tr>
<tr>
<td>1 tbsp</td>
<td>sugar</td>
</tr>
<tr>
<td>2 tsp</td>
<td>salt</td>
</tr>
</tbody>
</table>

**Instructions**

2. For a 10-quart canner, process 10 minutes at 10 pounds pressure or to a weighted-gauge pressure canner at 15 pounds pressure.

Recipe Comparison No. 3

**Chow-Chow**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pt</td>
<td>pickled okra</td>
</tr>
<tr>
<td>1/2 pt</td>
<td>pickled green beans</td>
</tr>
<tr>
<td>1/2 pt</td>
<td>pickled sweet peppers</td>
</tr>
<tr>
<td>1/2 pt</td>
<td>sliced zucchini</td>
</tr>
<tr>
<td>1 pt</td>
<td>chopped green tomatoes</td>
</tr>
<tr>
<td>1/2 pt</td>
<td>red green beans</td>
</tr>
<tr>
<td>1 tsp</td>
<td>salt</td>
</tr>
<tr>
<td>1 tsp</td>
<td>sugar</td>
</tr>
<tr>
<td>1 tsp</td>
<td>rice vinegar</td>
</tr>
<tr>
<td>1 tsp</td>
<td>celery seed</td>
</tr>
<tr>
<td>1 tsp</td>
<td>mustard seed</td>
</tr>
<tr>
<td>1 tsp</td>
<td>dill seed</td>
</tr>
</tbody>
</table>

**Instructions**

Recipe Comparison No. 3

CHOW CHOW

1 gallon green tomatoes
2 lb. mild hot heads
1 lb. greens
Hot peppers to taste
1 c. curing salt (round)
3 t. sugar
1 q. vinegar
6 lb. onions
2 lbs. squash

Ornd or finely chop tomatoes, cabbage, peppers, and onions.
Mix in a large dishpan well and vegetables and place covered in a crock over salt. Wash down flat and put a plate over it and let set about 3 hours.
Salted vegetables will be completely melted—oven completely dry. (Squeeze with hands.)
Mix sugar and vinegar, pour over vegetables. Tie about 3 tablespoons packing spices in cheesecloth or white thin tag, and put in jar. Boil until vegetables turn yellow. Pour into jars, seal.

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.

Processing Time

* Each food has its own processing time.
  Follow directions carefully!
* Time differs with size of jar.
* Too Little
  * Spoilage
Reliable Food Preservation Resources

- USDA Canning Methods: [http://www.uga.edu/nchfp/index.html](http://www.uga.edu/nchfp/index.html)
- Ball Blue Book Guide to Preserving
- So Easy to Preserve (book), Univ. of Georgia Cooperative Extension and Website: [http://www.uga.edu/setp/index.html](http://www.uga.edu/setp/index.html)

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- Information Staff, Agricultural Research Service, USDA.
Reliable Food Preservation Resources - 2019

Home food preservation is fun with tasty results. In order to ensure a safe product and to maximize flavor and texture of the food, always use a scientifically tested recipe. This is essential for canning in glass jars to prevent a life-threatening illness, botulism.

Scientific testing resulted in revision to several home canning processes in 1994. Recipes published prior to 1994, should be compared to a current, reliable resource for safety. Be aware that not all recipes found on the web or in publications are scientifically tested. Unsafe recipes or procedures may result in serious illness or death.

The listed resources are from organizations that validate their information and recipes for safety and accuracy. Cooperative Extension and universities are good sources.

**Websites:** information, tested recipes, “how to” videos, printable factsheets and more

- USDA’s National Center for Home Food Preservation: [http://www.uga.edu/nchfp](http://www.uga.edu/nchfp)
- Ball™ Home Canning: [http://www.freshpreserving.com/home](http://www.freshpreserving.com/home)
- Rutgers, The State University, Cooperative Extension: [https://njaes.rutgers.edu/food-safety/home-food-preservation/](https://njaes.rutgers.edu/food-safety/home-food-preservation/)
- University of Nebraska—Lincoln, Cooperative Extension: [https://food.unl.edu/canning-freezing-and-drying](https://food.unl.edu/canning-freezing-and-drying)

**Books:**

- *The All New Ball® Book of Canning and Preserving*, 2016

More resources on back
**FCHS Home Food Preservation**

**More Cooperative Extension Resources:**


**Free App on the Google Play Store** - Download the “OSU Canning Timer & Checklist” app created by Oregon State University Extension Service.

**Classes:**

**FCHS home food preservation classes:** Contact your local Rutgers Cooperative Extension office to inquire about classes.

**FCHS Master FoodPreservers:** These trained volunteers work with FCHS to educate the public about safe home food preservation. Contact your local FCHS professional to learn how to become a FMFP.

Updated by: Daryl Minch, FCHS Educator, Somerset County, 2/2019
Organisms that cause food spoilage—molds, yeasts, and bacteria—are always present in air, water and soil. Enzymes that may cause undesirable changes in flavor, color and texture are present in raw fruits.

When fruits are canned, they are heated hot enough and long enough to destroy spoilage organisms. This heating (or processing) also stops the action of enzymes. Because fruits have a high acid content, processing can be done in a boiling water bath canner. Though it takes longer, fruits can also be processed in a pressure canner. For directions for canning fruits in a pressure canner, call your county Extension agent.

**Equipment**

*Water-bath canners* are available on the market. Any big metal container may be used as a boiling water-bath canner if it is deep enough so the water can cover the jars by one or more inches and still have ample room for boiling (two to four inches above jar tops—see illustration). The canner must have a tight-fitting cover and a metal rack.

A pressure canner may be used, provided it is deep enough. Do not fasten the cover; leave the petcock open so steam can escape and pressure does not build up in the canner.

*Canning jars* should be checked closely for signs of cracks or chips. Jars specifically designed for home canning are best. Commercial food jars such as mayonnaise or coffee jars break easily and may not seal. Use only the half-pint, pint or quart sizes for fruits. Half-gallon jars may also be used for juices.

If jars will be processed in a boiling water bath for less than 10 minutes, they need to be sterilized by placing them in boiling water for 10 minutes before being filled. After the jars are sterilized, keep them hot by leaving them in the hot water until time to fill them. Jars processed in a boiling water bath for 10 minutes or more, or in a pressure canner, will be sterilized during processing and do not need prior sterilization. They do need to be washed in hot, soapy water, rinsed and kept hot until filled and placed in the canner.
Two-piece metal canning lids need to be prepared for use. The lids can be used only once, but the screw bands can be reused as long as they are in good condition. Read the manufacturer’s instructions on treating the lids. Some need to be covered with hot water, while others need to be boiled for a minute or more. Do not reuse lids from commercially canned foods for home canning.

Preparation of the Fruit
Choose fresh, firm fruits. The faster you can get them from the garden to the jar, the better. If you buy fruits to can, try to get them from a nearby garden or orchard. For even cooking, sort the fruits for size and ripeness. Wash all fruits thoroughly, whether or not they are to be pared. Dirt contains some of the bacteria hardest to kill. Do not let fruits soak; they may lose flavor and nutrients. Handle them gently to avoid bruising.

To prevent darkening – Some peeled or cut fruits darken when exposed to air. Any of these simple treatments will help prevent darkening.

1. Drop the fruit in a solution made from 1 teaspoon or 3000 mg ascorbic acid (vitamin C) and 1 gallon of water. (Crush tablets thoroughly.)

2. Use a commercial ascorbic acid mixture, available in grocery stores and drug stores, according to instructions on the container.

Hold the fruit in one of these solutions until you are ready to pack the fruit. Then drain the fruit well.

Canning Liquids for Fruits
Fruits may be canned in water, juice or a sweet syrup. The sweet syrup helps the fruit holds its shape, color and flavor but does not preserve the fruit.

Directions for canning each fruit will specify the canning liquid that results in the product most like the commercially-canned product. Most canning liquids contain sugar. However, you may want to experiment. You may be pleased with a water, juice or lighter syrup packed product.

Syrup Packs – Sugar syrup is made by mixing water or juice extracted from some of the fruit (see "Juice Packs") with sugar. The mixture is heated to dissolve the sugar and is kept hot until ready for use. Choose one of the syrups given in the chart below, to suit the sweetness of the fruit and your own taste.

Juice Packs – Commercial unsweetened apple juice, pineapple juice or white grape juice make good packing liquids for many fruits. These may be used as is or diluted with water. Juice can also be extracted from some of the fruit that is being canned or from fresh apples, pineapple or white grapes.

<table>
<thead>
<tr>
<th>Syrups for Use in Canning Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Syrup</strong></td>
</tr>
<tr>
<td>Very Light</td>
</tr>
<tr>
<td>Light</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Heavy</td>
</tr>
<tr>
<td>Very Heavy</td>
</tr>
</tbody>
</table>

* Approximate
** In general, up to one-half of the sugar may be replaced by corn syrup or mild flavored honey. A larger proportion of corn syrup may be used if a very bland, light-colored type is selected.
To extract juice – Thoroughly crush ripe, sound fruit. Heat to simmering over low heat. Strain through cheesecloth or a jelly bag.

Artificial Sweeteners
It is best to add these just before serving the fruit. Saccharin-based sweeteners can turn bitter during processing. Aspartame-based sweeteners lose their sweetening power during processing.

Filling the Jars
Fruits may be packed raw into jars or preheated and packed hot. Read directions for each fruit to determine which methods may be used. Remember, have the jars hot to prevent breakage as they are filled.

To raw pack – Put raw fruits into jars and cover with boiling-hot syrup, juice or water. Most raw fruits should be packed tightly into the jars because they shrink during processing.

To hot pack – Heat fruits in syrup, water or juice before packing. Pack hot food loosely. Food should be at or near boiling temperature when it is packed.

For either pack, use enough syrup, water or juice to fill around the solid food in the jar and to cover the food. See directions for each fruit for the correct amount of headspace to leave between the top of the food and the top of the jar. This head space is important for obtaining a good seal.

Closing the Jars
To remove any trapped air bubbles, slide a non-metallic spatula between the food and the sides of the jar. Add more liquid if necessary to obtain the proper headspace. Wipe the jar rim with a clean, damp cloth to remove any food particles.

Place the treated lid on the jar. Screw the metal screw band down fingertip tight.

To Process Fruits
Put filled jars on a rack in a canner containing hot or simmering water. For the raw pack, have water in the canner hot but not boiling; for the hot pack have water simmering.

Add boiling water if needed to bring water an inch or two over tops of jars; do not pour boiling water directly on glass jars. Put cover on the canner.

When the water in the canner comes to a rolling boil, start to count processing time. Boil gently and steadily for the time recommended for the food being canned. Add boiling water during processing if needed to keep the jars covered.

Remove jars from the canner immediately when the processing time is up. Place them on a rack, dry towels, boards or newspapers to prevent the jars from breaking on contact with a cold surface. Allow the jars to cool untouch, away from drafts. Do not be alarmed at popping sounds as the jars cool and seal.

Day-After-Canning Jobs
Test the seal on the jar lids. Press flat metal lids at the center. They should be slightly concave and not move. Screw bands may be removed from thoroughly cooled jars. Label sealed jars with content and date.

Store the canned food in a cool, dry place. Stored properly, canned fruits should retain their high quality for about one year.

Treat unsealed jars of food as fresh. The food can be eaten immediately, refrigerated, frozen or recanned. If you recan the food, the whole process must be repeated.

On Guard Against Spoilage
Do not taste or use food that shows any signs of spoilage. Look closely at all jars before opening them. A bulging lid or leaking jar is a sign of spoilage. When you open a jar, look for other signs such as spurting liquid, an off odor or mold. Dispose of all spoiled canned fruit in a place where it will not be eaten by children or pets.
Directions for Canning Fruits

Preparation Methods and Processing Times for Canning in a Boiling Water Bath

CAUTION! ALTITUDE ADJUSTMENTS: The processing times given here are those recommended by the U.S. Department of Agriculture for altitudes of 0-1000 feet. If you are canning at an altitude over 1000 feet, see last page for adjusted processing times. DO NOT DECREASE processing times given.

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Pack</th>
<th>Preparation</th>
<th>Processing Time (Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Juice</td>
<td>Hot</td>
<td>For best results, buy fresh juice from a local cider maker within 24 hours after it has been pressed or press your own. Refrigerate juice for 24 to 48 hours. Without mixing, carefully pour off clear liquid and discard sediment. Strain clear liquid through a paper coffee filter or double layer of damp cheesecloth. Sterilize jars. Heat juice, stirring occasionally, until juice begins to boil. Pour into hot jars, leaving 1/4-inch headspace.</td>
<td>Pints 5 Quarts 5 Half-Gallons 10</td>
</tr>
<tr>
<td>Apples</td>
<td>Hot</td>
<td>Make a very light, light or medium syrup. Wash, peel, core and slice apples. Treat to prevent darkening. Remove sliced apples from anti-darkening solution, drain and place in a large saucepan. Add 1 pint syrup, water or juice per 5 pounds apples. Boil 5 minutes, stirring occasionally. Pack hot apples into hot jars, leaving 12-inch headspace. Fill jar to 1/2 inch from top with hot syrup.</td>
<td>Pints 20 Quarts 20</td>
</tr>
<tr>
<td>Applesauce</td>
<td>Hot</td>
<td>Wash, peel and core apples. Treat to prevent darkening. Remove slices from anti-darkening solution and place drained slices in an 8- to 10-quart pot. Add 1/2 cup water. Stirring occasionally to prevent burning, heat quickly and cook until tender (5 to 20 minutes, depending on maturity and variety). Press through a sieve or food mill, if desired. If you prefer chunk-style sauce, omit the pressing step. If desired, add 1/8 cup sugar per quart of sauce. Reheat sauce to boiling. Pack into hot jars, leaving 1/2-inch headspace.</td>
<td>Pints 15 Quarts 20</td>
</tr>
<tr>
<td>Apricots</td>
<td></td>
<td>Follow directions and processing times for peaches.</td>
<td></td>
</tr>
<tr>
<td>Berries</td>
<td></td>
<td>Berries may be canned in water, juice or syrup. Prepare and heat the liquid of your choice. Wash, drain, cap and stem if necessary. For gooseberries, snip off heads and tails with scissors.</td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td></td>
<td>Stem and wash cherries. Remove pits if desired. If pitted, treat to prevent darkening. If cherries are canned unpitted, prick skins on opposite sides with a clean needle to prevent splitting. Cherries may be canned in water, apple juice, white grape juice or syrup. Heat to boiling, the liquid of your choice.</td>
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4
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Pack</th>
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<tr>
<td>Cherries</td>
<td>Hot</td>
<td>Stem and wash cherries. Remove pits if desired. If pitted, treat to prevent darkening. If cherries are canned unpitted, prick skins on opposite sides with a clean needle to prevent splitting. Cherries may be canned in water, apple juice, white grape juice or syrup. Heat to boiling, the liquid of your choice. In a large saucepan add 1/2 cup water, juice or syrup to each quart of drained fruit. Bring to a boil. Pack cherries in hot jars, leaving 1/2-inch headspace. Fill jar to 1/2 inch from top with hot liquid.</td>
<td>Pints 15 Quarts 20</td>
</tr>
<tr>
<td></td>
<td>Raw</td>
<td>Add 1/2 cup hot water, juice or syrup to each hot jar. Fill jars to 1/2 inch from the top with drained cherries, shaking down gently as you fill. Add more hot liquid, leaving 12-inch headspace.</td>
<td>Pints 25 Quarts 25</td>
</tr>
<tr>
<td>Fruit Purée</td>
<td>Hot</td>
<td>Stem, wash, drain, peel and remove pits, if necessary. Measure fruit into large saucepan, crushing slightly if desired. Add 1 cup hot water for each quart of fruit. Cook slowly until fruit is soft, stirring frequently. Press through sieve or food mill. If desired, add sugar to taste. Reheat pulp to boiling. If sugar was added, boil until it dissolves. Pack purée into hot jars, leaving 1/4-inch headspace.</td>
<td>Pints 15 Quarts 15</td>
</tr>
<tr>
<td>(For any</td>
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<tr>
<td>fruit except</td>
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<tr>
<td>figs)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>Hot</td>
<td>Peaches can be packed in very light, light or medium syrup. They can also be packed in water, apple juice or white grape juice. Prepare the liquid and keep it hot. Dip fruit in boiling water for 30 to 60 seconds until skins loosen. Dip quickly in cold water and slip off skins. Cut in half, remove pits and slice if desired. Treat to prevent darkening. Remove slices from the anti-darkening solution and drain well. In a large saucepan heat drained fruit in syrup, water or juice to a boil. Pack hot fruit into hot jars leaving 12-inch headspace. When packing halves, place them cut side down. Fill jars to 1/2 inch from the top with hot liquid.</td>
<td>Pints 20 Quarts 25</td>
</tr>
<tr>
<td></td>
<td>Raw</td>
<td>Remove slices from the anti-darkening solution and drain well. Pack raw fruit into hot jars, leaving 12-inch headspace. When packing halves, place them cut side down. Fill jars with hot liquid, to 1/2 inch from the top.</td>
<td>Pints 25 Quarts 30</td>
</tr>
<tr>
<td>Pears</td>
<td>Hot</td>
<td>Prepare a very light, light or medium syrup; or heat apple juice, white grape juice or water. Wash and peel pears. Cut lengthwise in halves and remove core. A melon baller or metal measuring spoon is suitable for coring pears. Treat to prevent darkening. Remove slices from the anti-darkening solution and drain well. Boil drained pears 5 minutes in syrup, juice or water. Pack hot pears into hot jars, leaving 12-inch headspace. Fill jars to 1/2 inch from top with hot liquid.</td>
<td>Pints 20 Quarts 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plums</td>
<td>Hot</td>
<td>Prepare a very light, light or medium syrup. Stem and wash plums. To can whole, prick skins on two sides of plums with fork to prevent splitting. Freestone varieties may be halved and pitted. Add plums to hot syrup and boil 2 minutes. Cover saucepan and let stand 20 to 30 minutes. Pack hot plums into hot jars, leaving 12-inch headspace. Fill jars with hot syrup to 1/2 inch from the top.</td>
<td>Pints 20 Quarts 25</td>
</tr>
<tr>
<td></td>
<td>Raw</td>
<td>Pack raw plums firmly into hot jars, leaving 1/2-inch headspace. Fill jars with hot syrup to 1/2 inch from the top.</td>
<td>Pints 20 Quarts 25</td>
</tr>
</tbody>
</table>
### Boiling Water Bath Processing Times for Fruits at Altitudes over 1000 Feet

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Style of Pack</th>
<th>Jar Size</th>
<th>Processing Time (Minutes) at Altitudes of</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1001-3000 feet</td>
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<tr>
<td>Apple Juice</td>
<td>Hot</td>
<td>Pints or Quarts</td>
<td>10</td>
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<tr>
<td></td>
<td></td>
<td>Half-Gallons</td>
<td>15</td>
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<tr>
<td>Apples</td>
<td>Hot</td>
<td>Pints or Quarts</td>
<td>25</td>
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<tr>
<td>Applesauce</td>
<td>Hot</td>
<td>Pints</td>
<td>20</td>
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<td></td>
<td></td>
<td>Quarts</td>
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<tr>
<td>Berries</td>
<td>Hot</td>
<td>Pints or Quarts</td>
<td>20</td>
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<td></td>
<td>Raw</td>
<td>Pints</td>
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<td></td>
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<td>Quarts</td>
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<tr>
<td>Cherries</td>
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<td>Raw</td>
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<tr>
<td>Fruit Purée</td>
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<tr>
<td>Peaches or</td>
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<tr>
<td>Apricots</td>
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<td>Quarts</td>
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<tr>
<td></td>
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<td>Pears</td>
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<td>Plums</td>
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<tr>
<td></td>
<td></td>
<td>Quarts</td>
<td>30</td>
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Organisms that cause food spoilage - molds, yeasts and bacteria - are always present in the air, water and soil. Enzymes that may cause undesirable changes in flavor, color and texture are present in raw fruits.

When tomatoes are canned, they are heated hot enough and long enough to destroy spoilage organisms. This heating (or processing) also stops the action of enzymes.

Tomatoes are classified as an acid food. Because of this, they may be safely canned in a water bath canner. Recent research has shown that for some products, pressure canning will result in a higher quality, more nutritious product.

Directions for canning a variety of tomato products are given on the following pages. Some recipes will give you the option of canning either in a pressure canner or in a boiling water bath. Some will give only boiling water bath times and others will give only pressure canning times. The recipes that specify only pressure canning have so many low acid ingredients added to them that they are only safe when canned in a pressure canner at the specified pressure.

**Equipment**

Water-bath cannners are available on the market. Any big metal container may be used as a boiling-water-bath canner if it is deep enough so the water can cover the jars by at least one inch and still have ample room for boiling (two or four inches above jar tops - see illustration). The canner must have a tight-fitting cover and metal rack.

A pressure canner may be used for a boiling water bath canner, provided it is deep enough. Do not fasten the cover; leave the petcock open so steam can escape and pressure does not build up in the canner.
A pressure canner is a specially made heavy pot that has a lid that can be closed steam-tight. It must have a rack in the bottom, a tight-fitting cover, exhaust vent (or petcock), safety valve and an accurate pressure gauge. The pressure gauge may be a weighted gauge that fits over the vent or a dial gauge on which a needle indicates the pressure inside the canner. Newer canners may also have an extra cover lock as an added safety feature.

Canning jars specifically designed for home canning are best. Commercial food jars such as many mayonnaise jars break easily and may not seal. Use only the half-pint, pint or quart sizes for tomatoes. Jars should be checked closely for cracks or chips.

If jars will be processed in a boiling water bath for less than 10 minutes, they need to be sterilized by placing them in boiling water for 10 minutes before being filled. After the jars are sterilized, keep them hot by leaving them in the hot water until time to fill them. Jars processed in a boiling water bath for 10 minutes or more, or in a pressure canner, will be sterilized during processing and do not need prior sterilization. They do need to be washed in hot, soapy water, rinsed and kept hot until filled and placed in the canner.

Two-piece metal canning lids need to be prepared for use. The lids can be used only once, but the screw bands can be reused as long as they are in good condition. Read the manufacturer’s instructions on treating the lids. Some need to be covered with hot water, while others need to be boiled for a minute or more. Do not reuse lids from commercially canned foods for home canning.

**Preparing the Tomatoes**
Select disease-free, preferably vine ripened, firm tomatoes for canning. Do not can tomatoes from dead or frost-killed vines. Wash all tomatoes thoroughly. To quickly peel tomatoes, dip them in boiling water for 30 to 60 seconds or until skins split. Then dip in cold water, slip off skins and remove cores.

**Filling the Jars**
Tomatoes may be packed raw into jars or they may be preheated and packed hot. Read the directions for each tomato product to determine which method may be used. If given a choice, the hot pack produces a higher quality product. Remember, have the jars hot to prevent breakage as they are filled.
To raw pack - Put raw tomatoes into jars and cover with boiling water. Raw tomatoes should be packed firmly into the jars because they shrink during processing.

To hot pack - Heat tomatoes without adding liquid or in water or juice before packing. Pack the hot food loosely. Then cover with the boiling cooking liquid or juice drawn from the tomatoes.

For either pack, use enough liquid to fill around the solid food in the jar and to cover the food. See directions for each product for the correct amount of headspace to leave between the top of the food and the top of the jar. This head space is important for obtaining a good seal.

Salt may be added to each jar, if desired. The salt is only for seasoning and does not help to preserve the food. If salt is used, canning salt is recommended to prevent the liquid from turning cloudy. Usually 1/2 teaspoon salt per pint is adequate.

Acidify Some Products for Safety
Because tomatoes may be borderline in the amount of acid they contain, you must take some precautions to can them safely. To ensure the safety of whole, crushed or juiced tomatoes they must be acidified, whether processed in a boiling water bath or pressure canner.

To acidify these tomatoes, add 1 tablespoon of bottled lemon juice or 1/4 teaspoon citric acid per pint of tomatoes. For quarts, use 2 tablespoons of bottled lemon juice or 1/2 teaspoon citric acid.

The acid can be added directly to each jar before filling them with the product. If this makes the product taste too acid, add a little sugar to offset the taste.

NOTE: Four tablespoons of vinegar per quart or two tablespoons per pint can be used instead of lemon juice or citric acid. However, the vinegar may cause undesirable flavor changes.

Closing the Jars
To remove any trapped air bubbles, slide a non-metallic spatula between the food and the sides of the jar. Add more liquid if necessary to obtain the proper headspace. Wipe the jar rim with a clean damp cloth to remove any food particles.

Place the treated lid on the jar. Screw the metal screw band down fingertip tight.

To Process Tomato Products in a Boiling Water Bath Canner
* Put filled jars on a rack in a canner containing hot or simmering water. For the raw pack, have water in the canner hot but not simmering; for the hot pack have water simmering.
* Add boiling water if needed to bring water an inch or two over tops of jars; don’t pour boiling water directly on glass jars. Put the cover on the canner.
* When the water in the canner comes to a rolling boil, start to count processing time. Boil gently and steadily for the time recommended for the food being canned. Add boiling water during processing if it’s needed to keep jars covered.
* Remove jars from the canner immediately when the processing time is up. Place them on a rack, dry towels, boards or newspapers to prevent jars from breaking on contact with a cold surface. Allow the jars to cool untouched, away from drafts. Do not be alarmed at popping sounds as the jars cool and seal.

To Process Tomato Products in a Pressure Canner
Read the manufacturer’s instructions on the use of your pressure canner. The following are general instructions:
* Have the two to three inches of water in your canner hot but not boiling if you are canning raw pack foods. For hot pack foods, the water can be hot or simmering.
* Place the jars of food on the rack in the canner so steam can flow around each jar.
* Fasten the canner lid so no steam can escape except through the vent.
* Turn heat to high and watch until steam begins to escape from the vent. Let the steam escape steadily for 10 minutes.
* Close the vent, using a weight, valve or screw, depending on the type of canner. If you have a weighted gauge canner that has a weight of varying pressures, be sure you are using the correct pressure.
* For a dial gauge canner, let the pressure rise quickly to eight pounds of pressure. Adjust the burner temperature down slightly and let the pressure continue to rise to the correct pressure. (If the burner were left on high, the pressure would be hard to regulate when the correct pressure is reached.) Start counting the processing time as soon as the pressure is reached. For weighted gauge canners, let the canner heat quickly at first and then reduce the heat slightly until the weight begins to rock gently or “jiggle” two or three times per minute, depending on the type of canner you have. Start counting the processing times as soon as the weight does either of these.
* Keep the pressure constant by regulating the heat under the canner. Do not lower the pressure by opening the vent or lifting the weight. Keep drafts from blowing on the canner.
* When processing time is completed, carefully remove the canner from the heat. If the canner is too heavy, simply turn off the heat.
* Let the pressure in the canner drop to zero. This will take 30 to 45 minutes in a 16-quart canner and nearly an hour for a 22-quart canner. Do not rush the cooling by setting the canner in water or by running cold water over the canner. Never lift the weight or open the vent to hasten the reduction of pressure.
* When the gauge on a dial gauge canner registers zero or when a gentle nudge to the weight on a weighted gauge canner does not produce steam or resistance, wait two minutes, and then open the vent or remove the weight. Wait two more minutes and then open the canner. Unfasten the lid, and tilt the far side up, so the steam escapes away from you. Do not leave the canner unopened, or the food inside could begin to spoil.
* Carefully remove the jars from the canner. To prevent the jars from breaking on contact with a cold surface, place the hot jars on a rack, dry towels, boards or newspapers.
* Allow the jars to cool untouched, away from drafts. Do not be alarmed at popping sounds as the jars cool and seal.

**Day-After-Canning Jobs**

Test the seal on the jar lids. Press flat metal lids at the center. They should be slightly concave and not move. Screw bands may be removed from thoroughly cooled jars. Label sealed jars with content and date.

Store the canned food in a cool, dry place. Stored properly, canned fruits should retain their high quality for about one year.

Treat unsealed jars of food as fresh. The food can be eaten immediately, refrigerated, frozen or recanned. If you recan the food, the whole process must be repeated.

**On Guard Against Spoilage**

Do not taste or use canned tomatoes or tomato products that show any signs of spoilage! Look closely at all jars before opening them. A bulging lid or leaking jar are signs of spoilage. When you open the jar, look for other signs such as spurting liquid, an off odor or mold. All spoiled canned tomatoes should be discarded in a place where they will not be eaten by humans or pets.

Some tomato products have vegetables or meats added to them. If these spoil, they can contain botulism toxin. Also, if not properly processed, these products can contain botulism toxin, without showing signs of spoilage. Tomato products that contain vegetables or meats are considered improperly canned if ANY of the following are true:

* The product was not prepared according to an APPROVED recipe.
* Ingredients were ADDED that were not in the approved recipe or the proportions of ingredients were CHANGED.
* Up-to-date researched processing times and methods were NOT used. Many products require pressure canning.
* The correct processing time was NOT used for the size of jar or style of pack.
* The gauge of the canner was INACCURATE.
* The processing time and pressure were NOT correct for the altitude at which the food was canned.

Tomato products that contain vegetables or meats that are improperly processed or that have spoiled can contain botulism toxin. Because of this, they should be detoxified before being discarded.

To detoxify these products, carefully remove the lid from the jar. Place the jar(s) of food and its lid(s) in a saucepot. Add enough hot water to cover the jar(s). Boil for 30 minutes and then cool. Drain water and dispose of food and lid. The jar may be reused.

Surfaces that come in contact with spoiled or question-able tomato mixtures should be cleaned with a solution of 1 part chlorine bleach to 5 parts water. Wet the surface with this solution and let stand 5 minutes before rinsing.
Directions for Canning Tomatoes and Tomato Products

CAUTION! ALTITUDE ADJUSTMENTS: The processing times and pressures given in this publication are those recommended by the U.S. Department of Agriculture for altitudes of 0-1000 feet. DO NOT DECREASE the processing times or pressures given. If you are canning at a higher altitude, make the following adjustments:

In a Boiling Water Bath (212° F)
See processing times at the end of this section.

In a Dial Gauge Pressure Canner
As the altitude increases, the processing time for each food stays the same, but the canner pressure must be increased as follows:
* At altitudes of 1001-2000 feet the processing pressure does not change. Process at 11 pounds pressure.
* At altitudes of 2001-4000 feet, process at 12 pounds pressure.
* At altitudes of 4001-6000 feet, process at 13 pounds pressure.
* At altitudes of 6001-8000 feet, process at 14 pounds pressure.

In a Weighted Gauge Pressure Canner
* At altitudes above 1000 feet, the processing time for each food stays the same, but the food must be processed at 15 pounds pressure.

<table>
<thead>
<tr>
<th>Product</th>
<th>Pack</th>
<th>Preparation</th>
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</thead>
<tbody>
<tr>
<td>Tomatoes - Crushed</td>
<td>Hot Pack</td>
<td>Wash tomatoes and dip in boiling water for 30 to 60 seconds or until skins split. Then dip in cold water, slip off skins and remove cores. Trim off any bruised or discolored portions and quarter. Heat about 1 pound of the quarters quickly in a large pot, crushing them with a wooden mallet or spoon as they are added to the pot. This will draw off some juice. Continue heating the tomatoes, stirring to prevent burning. Once the tomatoes are boiling, gradually add remaining quartered tomatoes, stirring constantly. These remaining tomatoes do not need to be crushed. They will soften with heating and stirring. Continue until all tomatoes are added. Then boil gently 5 minutes. Add bottled lemon juice or citric acid to hot jars, according to the directions on page 3. Add 1/2 teaspoon salt to each pint jar; 1 teaspoon to each quart jar, if desired. Fill jars immediately with hot tomatoes, leaving 12-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids and process.</td>
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<tr>
<td></td>
<td>* Option 1</td>
<td>Process in Boiling Water Bath (212° F):</td>
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<tr>
<td></td>
<td></td>
<td>Pints: 35 minutes</td>
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<td></td>
<td></td>
<td>Quarts: 45 minutes</td>
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<td></td>
<td>* Option 2</td>
<td>Process in Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:</td>
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<tr>
<td></td>
<td></td>
<td>Pints: 15 minutes</td>
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<td></td>
<td></td>
<td>or Quarts: 10 minutes</td>
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<tr>
<td>Tomatoes - Whole or Halved (Packed in Water)</td>
<td>Hot Pack</td>
<td>Wash tomatoes. Dip in boiling water for 30 to 60 seconds or until skins split. Then dip in cold water, slip off skins and remove cores. Leave whole or halve.</td>
</tr>
<tr>
<td>Raw Pack</td>
<td></td>
<td>Place prepared tomatoes in saucepan and cover with water. Bring to a boil and boil gently for 5 minutes. Add bottled lemon juice or citric acid to hot jars, according to the directions on page 3. Add 1/2 teaspoon of salt to each pint jar; 1 teaspoon to each quart jar, if desired. Pack hot tomatoes into hot jars, leaving 12-inch headspace. Fill jars to 1/2 inch from top with hot cooking liquid. Remove air bubbles. Wipe jar rims. Adjust lids and process as directed below.</td>
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<td>Heat water for packing tomatoes, to a boil. Add bottled lemon juice or citric acid to hot jars according to the directions. Add 1/2 teaspoon salt to each pint jar; 1 teaspoon to each quart jar, if desired. Pack prepared tomatoes into hot jars, leaving 12-inch headspace. Fill hot jars to 1/2 inch from the top with boiling water. Remove air bubbles. Wipe jar rims. Adjust lids and process.</td>
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<td>* Option 1</td>
<td>Process in Boiling Water Bath (212° F):</td>
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<td>Pints: 40 minutes</td>
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<td></td>
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<td>Quarts: 45 minutes</td>
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<td></td>
<td>* Option 2</td>
<td>Process in Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:</td>
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<td></td>
<td></td>
<td>Pints: 10 minutes</td>
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<td></td>
<td></td>
<td>or Quarts: 10 minutes</td>
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## Tomato - Vegetable Mixtures

Unless a tested recipe is used, all tomato-vegetable mixtures must be processed in a pressure canner, according to the directions for the vegetable in the mixture that has the longest processing time. Tomato-vegetable mixture recipes in this publication may have shorter processing times because they have been tested for both pH and heat penetration. When the exact amounts specified in these recipes are used, these mixtures can be processed using the times given.

### Tomatoes with Okra or Zucchini

**Hot Pack**

Wash tomatoes and okra or zucchini. Dip tomatoes in boiling water 30 to 60 seconds or until skins split. Then dip in cold water, slip off skins and remove cores. Quarter tomatoes. If using okra, trim stems and leave whole or slice into 1 inch pieces. If using zucchini, slice and cube. Bring tomatoes to a boil and simmer 10 minutes. Add okra or zucchini and boil gently 5 more minutes. Add 1/2 teaspoon of salt to each pint jar; 1 teaspoon to each quart jar, if desired. Fill hot jars with mixture, leaving 1-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids and process.

* Process in a Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:
  - Pints 30 minutes
  - Quarts 35 minutes

### Variation

You may also add four or five pearl onions or two 1/4 inch thick onion slices to each jar.

### Stewed Tomatoes

*(about 3 pint jars)*

2 quarts chopped tomatoes
1/4 cup chopped green peppers
1/4 cup chopped onions
2 teaspoons celery salt
2 teaspoons sugar
1/4 teaspoon salt

**Hot Pack**

Combine all ingredients. Cover and cook 10 minutes, stirring occasionally to prevent sticking. Pour hot into hot jars, leaving 12-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids and process.

* Process in a Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:
  - Pints 15 minutes
  - Quarts 20 minutes

### Tomato Juice

**Hot Pack**

Wash tomatoes, remove stems, and trim off bruised or discolored portions. To prevent juice from separating, quickly cut about 1 pound of tomatoes into quarters and put directly into saucepan. Heat immediately to boiling while crushing. Continue to slowly add and crush freshly cut tomato quarters to the boiling mixture. Make sure the mixture boils constantly and vigorously while you add the remaining tomatoes. Simmer 5 minutes after you add all the pieces.

NOTE: If you are not concerned about juice separation, simply slice or quarter tomatoes into a large saucepan. Crush, heat and simmer for 5 minutes before juicing. Press the heated juice through a sieve or food mill to remove skins and seeds. Add bottle lemon juice or citric acid to hot jars, according to the instructions on page 3. Heat juice again to boiling. Add 1/2 teaspoon salt to each pint jar; 1 teaspoon to each quart jar, if desired. Fill hot jars with hot tomato juice, leaving 1/2-inch headspace. Wipe jar rims. Adjust lids and process.

* Option 1 Process in Boiling Water Bath (212° F):
  - Pints 35 minutes
  - Quarts 40 minutes

* Option 2 Process in Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:
  - Pints 15 minutes
  - Quarts 15 minutes
Tomato Sauce (Unseasoned)

**Hot Pack**
Wash tomatoes, remove stems, and trim off bruised or discolored portions. To prevent juice from separating, quickly cut about 1 pound of tomatoes into quarters and put directly into saucepan. Heat immediately to boiling while crushing. Continue to slowly add and crush freshly cut tomato quarters to the boiling mixture. Make sure the mixture boils constantly and vigorously while you add the remaining tomatoes. Simmer 5 minutes after you add all pieces.

NOTE: If you are not concerned about sauce separation, simply slice or quarter tomatoes into a large saucepan. Crush, heat and simmer for 5 minutes before juicing. Press the heated juice through a sieve or food mill to remove skins and seeds. Simmer in a large-diameter saucepan until volume is reduced by about one-third for thin sauce; by one-half for thick sauce. Add bottled lemon juice or citric acid to jars; according to the directions on page 3. Add 1/2 teaspoon salt to each pint jar; 1 teaspoon to each quart jar, if desired. Fill hot jars, leaving 1/4-inch headspace. Wipe jar rims. Adjust lids and process.

<table>
<thead>
<tr>
<th>* Option 1</th>
<th>Process in Boiling Water Bath (212° F):</th>
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<tbody>
<tr>
<td>Pints</td>
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<th>* Option 2</th>
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<tr>
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<td>or Quarts</td>
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**Tomato Paste**

*(about 9 half-pint jars)*

8 quarts peeled, cored chopped tomatoes (about 4 dozen large)
1 1/2 cups chopped sweet red peppers (about 3)
2 bay leaves
1 teaspoon salt
1 clove garlic (optional)

**Hot Pack**
Combine first four ingredients and cook slowly 1 hour. Press through a fine sieve. Add garlic clove, if desired. Continue cooking slowly until thick enough to round up on a spoon, about 2 1/2 hours. Stir frequently to prevent sticking. Remove garlic clove and bay leaves. Pour boiling hot paste into hot half-pint jars, leaving 1/4-inch headspace. Wipe jar rims.

Adjust lids and process in a Boiling Water Bath (212° F).

**Tomato Catsup**

*(about 6 or 7 pint jars)*

24 pounds tomatoes
3 cups chopped onions
3/4 teaspoon ground red pepper (cayenne)
4 teaspoons whole cloves
3 sticks cinnamon, crushed
1 1/2 teaspoons whole allspice
3 tablespoons celery seeds
3 cups cider vinegar
1 1/2 cups sugar
1/4 cup salt

**Hot Pack**
Wash tomatoes. Dip in boiling water for 30 to 60 seconds or until skins split. Then dip in cold water, slip off skins and remove cores. Quarter tomatoes into 4-gallon pot. Add onions and red pepper. Bring to boil and simmer 20 minutes, uncovered. Combine spices in a spice bag. Place spices and vinegar in a 2-quart saucepan. Bring to a boil. Cover, turn off heat and let stand for 20 minutes.

Remove spice bag from the vinegar and add the vinegar to the tomato mixture. Boil about 30 minutes. Press boiled mixture through a food mill or sieve. Return to pot. Add sugar and salt and boil gently, stirring frequently until volume is reduced by one-half or until mixture rounds up on spoon without separation. Pour into hot jars, leaving 1/8-inch headspace. Wipe jar rims.

Adjust lids and process in a Boiling Water Bath (212° F).

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<th>15 minutes</th>
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### Hot Chili Salsa

(about 7 pint jars)

- 5 pounds tomatoes
- 2 pounds chile peppers
- 1 pound onions, chopped
- 1 cup vinegar
- 3 teaspoons salt
- 1/2 teaspoon pepper

To Prepare Chile Peppers - (CAUTION: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face.) Wash and dry chiles. Sit each pepper on its side to allow steam to escape. Peel peppers using one of the following methods:

- Oven or broiler method: Place chiles in oven (400° F) or broiler for 6 to 8 minutes until skins blister.
- Range-top method: Cover hot burner, either gas or electric, with heavy wire mesh. Place chiles on burner for several minutes until skins blister.

Allow peppers to cool. Place in a pan and cover with a damp cloth. This will make peeling the peppers easier. After several minutes, peel each pepper. Remove stem and seeds.

**Hot Pack**

Chop peppers. Wash tomatoes and dip in boiling water for 30 to 60 seconds or until skins split. Dip in cold water, slip off skins and remove cores. Coarsely chop tomatoes. Add chopped onions, peppers and remaining ingredients in a large saucepan. Heat to a boil and simmer 10 minutes. Pour into hot jars, leaving 1/2-inch headspace. Wipe jar rims. Adjust lids and process in a Boiling Water Bath (212° F).

#### Barbecue Sauce

(about 4 pint jars)

- 4 quarts peeled, cored chopped red-ripe tomatoes (about 24 large)
- 2 cups chopped celery
- 2 cups chopped onions
- 1 1/2 cups chopped sweet red or green peppers (about 3 medium)
- 2 red hot peppers, cored, chopped
- 2 cloves garlic, crushed
- 1 cup brown sugar
- 1 tablespoon dry mustard
- 1 tablespoon paprika
- 1 tablespoon salt
- 1 tablespoon black peppercorns
- 1 teaspoon Tabasco Sauce
- 1/8 teaspoon cayenne pepper
- 1 cup vinegar

**Hot Pack**

Combine tomatoes, onions, celery and peppers. Cook until vegetables are soft (about 30 minutes). Purée using a fine sieve, food mill, food processor or blender. Cook until mixture is reduced to about one-half (approximately 45 minutes). Tie peppercorns in a cheesecloth bag; add with remaining ingredients and cook slowly until mixture is the consistency of catsup, about 1 1/2 to 2 hours. As mixture thickens, stir frequently to prevent sticking. Remove bag of peppercorns. Pour hot sauce into hot jars, leaving 1/2-inch headspace. Wipe jar rims. Adjust lids and process in a Boiling Water Bath (212° F).

#### Spicy Chili Sauce

(about 6 pint jars)

- 4 quarts peeled, cored chopped tomatoes (about 24 large)
- 2 cups chopped onions
- 1 1/2 to 2 cups chopped sweet green peppers (about 3 medium)
- 1 1/2 cups sugar
- 1 tablespoon salt
- 1 tablespoon celery seed
- 1 teaspoon ground all spice
- 1 teaspoon ground cloves
- 1 teaspoon ground cinnamon
- 1 teaspoon ground ginger
- 1 to 1 1/2 cups vinegar

**Hot Pack**

Combine all ingredients. Bring to a boil; simmer until thick as desired (about 1 to 2 hours). Stir frequently to prevent sticking. Pour hot sauce into hot jars, leaving 1/2-inch headspace. Wipe jar rims. Adjust lids and process in a Boiling Water Bath (212° F).
Spaghetti Sauce
With Meat
(about 9 pints)

30 pounds of tomatoes
2 1/2 pounds ground beef or sausage
5 cloves garlic, minced
1 cup chopped onions
1 cup chopped celery or green peppers
1 pound fresh mushrooms, sliced (optional)
2 tablespoons oregano
4 tablespoons minced parsley
2 teaspoons black pepper
4 1/2 teaspoons salt
1/4 cup brown sugar

Hot Pack
Wash tomatoes and dip in boiling water for 30 to 60 seconds or until skins split. Dip in cold water and slip off skins. Remove cores and quarter tomatoes. Cook tomatoes for 20 minutes, uncovered in a large saucepan. Stir as needed to prevent sticking. Press through a food mill or sieve.

Sauté beef or sausage until brown. Add garlic, onions, celery or green pepper and mushrooms, if desired. Cook until vegetables are tender. Combine with tomato pulp in large saucepan. Add spices, salt and sugar. Bring to a boil. Simmer, uncovered, stirring frequently, until thick enough for serving. (The volume should be reduced by nearly one-half.) Pour into hot jars, leaving 1-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids and process.

Process in Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure:
- Pints 60 minutes
- Quarts 70 minutes
<table>
<thead>
<tr>
<th>Product</th>
<th>Style of Pack</th>
<th>Jar Size</th>
<th>1001-3000 feet</th>
<th>3001-6000 feet</th>
<th>6001-8000 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes-crushed</td>
<td>Hot</td>
<td>Pints</td>
<td>40</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quarts</td>
<td>50</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>Tomatoes-Whole or Halved</td>
<td>Raw or Hot</td>
<td>Pints</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>(Packed in Water)</td>
<td></td>
<td>Quarts</td>
<td>50</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>Tomato Juice</td>
<td>Hot</td>
<td>Pints</td>
<td>40</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quarts</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Tomato Sauce-Unseasoned</td>
<td>Hot</td>
<td>Pints</td>
<td>40</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quarts</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Tomato Paste</td>
<td>Hot</td>
<td>Half-Pints</td>
<td>50</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>Tomato Catsup</td>
<td>Hot</td>
<td>Pints</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Chili Salsa</td>
<td>Hot</td>
<td>Pints</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Barbeque Sauce</td>
<td>Hot</td>
<td>Half-Pints or Pints</td>
<td>25</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Spicy Chili Sauce</td>
<td>Hot</td>
<td>Half-Pints or Pints</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>
Puting Knowledge to Work

When you have a question...
Call or visit your local office of
The University of Georgia’s Cooperative Extension Service.

You’ll find a friendly, well-trained staff ready to help you with information, advice and publications covering family and consumer sciences, agriculture and natural resources, 4-H and youth development.
Organisms that cause food spoilage—molds, yeasts and bacteria—are present everywhere in the air, soil and water. Enzymes that may cause undesirable changes in flavor, color and texture are present in raw vegetables.

When vegetables are canned, they are heated hot enough and long enough in the jar to destroy organisms that can make people sick in addition to spoilage organisms. This heating (or processing) also stops the action of enzymes that can spoil food quality.

Pressure canning is the only safe method of canning all vegetables (except tomatoes). Jars of food are placed in a pressure canner which is heated to an internal temperature of at least 240°F. This temperature can be reached only in a pressure canner.

The *Clostridium botulinum* microorganism is the main reason pressure canning is necessary. Though the bacterial cells are killed at boiling temperatures, the spores they form can withstand very long boiling. In the soils, these bacteria are naturally found in the spore form. The spores grow out well in moist, low-acid foods in the absence of air, such as in canned low acid foods (vegetables and meats). When this happens, the spores change to growing bacterial cells which produce the deadly botulinum toxin (poison). This growth and toxin formation can occur without any noticeable signs of spoilage in the sealed jar.

These spores can be destroyed by canning the food at a temperature of at least 240°F. This temperature is above the 212°F boiling point of water, so it can only be reached in a pressure canner at the appropriate pressure (10 pounds at sea level). Because most people do not can at sea level, use the pressure given with the directions for canning vegetables. The pressures are different for dial and weighted gauge canners, because the weighted gauge canners operate in a manner that provides some additional safety margin over dial gauges. Recommended pressures are different for different altitudes; be sure to check altitude corrections if canning at altitudes over 1000 feet.

**Equipment**

A *pressure canner* is necessary for home canning of vegetables. It must have a rack in the bottom, a tight-fitting cover, exhaust vent (or petcock), safety valve and an accurate pressure gauge. The pressure gauge may be a weighted gauge that fits over the vent or a dial gauge on which a needle indicates the pressure inside the canner. Newer canners may also have an extra cover lock as an added safety feature.

*Canning jars* should be checked closely for cracks or chips. Use jars specifically designed for home canning. Commercial food jars such as mayonnaise or coffee jars break easily, especially in pressure canners, and may not seal with home canning lids. Use only half-pint, pint and quart sizes, and as specified for individual food processing directions.

Before using the jars, check closely for cracks, nicks or chips. Wash jars in hot soapy water and rinse well. Keep the jars hot until they are filled and placed in the canner. This will help prevent jar breakage.

*Two-piece metal canning lids* need to be prepared for use. The flat lids can be used only once for sealing new products, but the ring bands can be reused as long as they are in good condition. Pretreat the new flat lids as directed by the manufacturer. Do not reuse lids from commercially canned foods for home canning.

**Preparing the Vegetables**

Select only fresh, young, tender vegetables for canning. The sooner you can get them from the garden to the jar, the better. If you buy vegetables to can, try to get them from a nearby garden or farm.
For ease of packing and even cooking, sort the vegetables for size and maturity. Wash all vegetables thoroughly, whether or not they will be peeled. Dirt contains some of the bacteria hardest to kill. Do not let vegetables soak; they may lose flavor and nutrients. Handle them gently to avoid bruising.

**Filling the Jars**
Vegetables may be packed raw into jars or pre-heated and packed hot. Read the directions for each vegetable to determine which method may be used. If given a choice, the hot pack produces a higher quality product. Remember, have the jars hot to prevent breakage as they are filled.

**To raw pack** - Put raw vegetables into jars and cover with boiling water. Most raw vegetables (except for starchy ones) should be packed firmly into the jars. Starchy vegetables such as corn, peas and lima beans should be packed loosely, because they expand during processing.

**To hot pack** - Heat vegetables in water or steam before packing. See directions for specific vegetables. Then cover with the boiling cooking liquid. Pack the hot food loosely.

For either pack, use enough liquid to fill around the solid food in the jar and to cover the food. See directions for each vegetable for the correct amount of headspace to leave between the top of the food and the top of the jar. This headspace is important for obtaining a good seal.

Salt may be added to each jar, if desired. The salt is only for seasoning and does not help to preserve the food. If salt is used, canning salt is recommended to prevent the liquid from turning cloudy. Usually 1/2 teaspoon salt per pint is adequate.

**Closing the Jars**
To remove any trapped air bubbles, slide a non-metallic (eg., plastic) spatula between the food and the sides of the jar. Add more liquid if necessary to obtain the proper headspace. Wipe the jar rim with a clean damp paper towel to remove any food particles or liquids. Place the flat lid prepared according to the manufacturer’s directions on the filled jar. Screw the metal ring band down fingertip tight.

**Processing Vegetables**
Read the manufacturer’s instructions on the use of your pressure canner. The following are general instructions:

* Place the rack in the bottom of your pressure canner. Preheat two to three inches of water in your canner. The water should be hot but not simmering if you are canning raw pack foods. For hot pack foods, the water should be simmering or 180°F.

* Using a canning jar lifter, place filled jars on a rack in the canner containing hot or simmering water. Make sure the jar lifter is securely positioned below the neck of the jar and ring band and keep the jar upright at all times. Tilting the jar could cause food or covering liquid to spill into the sealing area of the lid. Space the jars evenly around the canner.

* Fasten the canner lid securely. Leave the weight off the vent pipe or open the petcock.

* Turn heat to high so it boils and steam flows freely in a funnel shape from the open vent pipe. Let the steam escape (vent) continuously for 10 minutes with the heat on the high setting.

* Close the vent, using a weight, or close the petcock, depending on the type of canner. If you have a weighted gauge canner that has a weight of varying pressures, be sure you are using the correct pressure setting. The canner will begin to pressurize.

* For a dial gauge canner, let the pressure rise quickly to eight pounds of pressure. Adjust the burner temperature down slightly and let the pressure continue to rise to the correct pressure. (If the burner was left on high, the pressure would be hard to regulate when the correct pressure is reached.)

* Start counting the processing time as soon as the pressure is reached. For weighted gauge cannners, let the canner heat quickly at first and then reduce the heat slightly until the weight begins to rock gently or “jiggle” two or three times per minute, depending on the type of canner you have. Start counting the processing time as soon as the weight indicates the canner is at pressure, according to manufacturer’s directions.

* Keep the pressure constant by regulating the heat under the canner. **Do not lower the pressure by opening the vent or lifting the weight.** Keep drafts from blowing on the canner. If the pressure ever drops below the recommended setting, bring the canner back to pressure and begin timing of the process over, from the beginning. This is important for the safety of the food.
When processing time is completed, turn off the heat. The canner may be removed from the heat of the electric burner if possible to do so without causing jars to tilt. If the canner is too heavy, simply turn off the heat and leave it in place. It is not necessary to move a canner from a turned off gas burner.

Let the pressure in the canner drop to zero through natural cooling. This can take 30 to 45 minutes in a 16-quart canner and nearly an hour for a 22-quart canner; the actual time will vary by the type of canner and the amount of hot food in the canner. Do not rush the cooling by setting the canner in water or by running cold water over the canner. Never lift the weight or open the vent to hasten the reduction of pressure.

When the gauge on a dial gauge canner registers zero or it is a gentle nudge to the weight on a weighted gauge canner does not produce steam or resistance, wait two minutes, and then open the vent or remove the weight. Wait ten more minutes and then open the canner. Unfasten the lid, and tilt it so the steam escapes away from your face. Do not leave the canner unopened to cool completely, or the food inside could begin to spoil and the canner could be difficult to open.

Using a jar lifter, carefully remove the jars from the canner being careful not to tilt them. Carefully place the jars right side up on a rack or dry towels to prevent jars from breaking on contact with a cold surface. Leave at least one inch of space between jars during cooling.

Allow the jars to cool undisturbed, away from drafts, for 12 to 24 hours. Do not tighten ring bands on the lids or push down on the center of the lid until the lid is completely cooled. Even if a popping sound is heard as lids seal, leave the jar and lid untouched until completely cool.

Day-After Canning Jobs
Test the seal on the jar lids. Press flat metal lids at the center of the lid. They should be slightly concave and should not move. Ring bands should be removed from thoroughly cooled jars; wash and dry them so they will be in good condition after storing.

Wash food residue from the jars and rinse. Label sealed jars with contents and date.

Store the canned food in a cool, dry place. Stored properly, canned vegetables should retain their high quality for about one year.

Unsealed jars of foods need to be treated as fresh. The food can be eaten immediately, refrigerated, frozen or reprocessed. If you reprocess the food, the whole processing time must be repeated.

On Guard Against Spoilage
Do not taste or use canned vegetables that show any signs of spoilage! Look closely at all jars before opening them. A bulging lid or leaking jar is a sign of spoilage. When you open the jar, look for other signs such as spewing liquid, an off odor or mold.

All spoiled canned foods should be discarded in a place where they will not be eaten by humans or pets. Spoiled low acid vegetables can contain botulism toxin. Also, if not properly processed, canned vegetables can contain botulism toxin without showing signs of spoilage. Vegetables are considered IMPROPERLY canned if any of the following are true:

* The food was NOT processed in a pressure canner.
* The gauge of the canner was INACCURATE.
* Up-to-date researched processing times and pressures were NOT used for the size of jar, style of pack and kind of food being processed.
* Ingredients were added that were NOT in an approved recipe or the proportions of ingredients were CHANGED.
* The processing time and pressure were NOT correct for the altitude at which the food was canned.

Because improperly canned vegetables may contain botulism toxin without showing signs of spoilage, they should also be detoxified before being discarded if the seals are broken. Spoiled or suspect jars of vegetables that are still sealed should be wrapped securely in a heavy plastic garbage bag. Close and place the bag in trash or dispose in a nearby landfill. Be sure to discard in a manner so they will not be eaten by humans or pets. If the jars are unsealed or opened, they should be detoxified before discarding. Be extremely careful not to splash or come in contact with the suspect food or any liquid. Contact with botulinum toxin can be fatal whether it is ingested or enters through the skin. Wear disposable rubber or heavy plastic gloves. To detoxify these products, place the jar(s) with lid(s) on their sides in a large stockpot or boiling water canner. Wash your hands and gloves thoroughly. Carefully add water to the pot, avoiding splashing, being sure that the water covers the jars. Heat the water to a vigorous boil and boil for 30 minutes. Cool and discard all contents, although the jar may be re-used if desired and care is exercised in cleaning it up.

Surfaces that come in contact with spoiled or questionable canned vegetables or their liquid should also be cleaned up, taking care to avoid contact with suspect foods or liquids. Wear rubber or heavy plastic gloves while cleaning up. A freshly made solution of 1 part unscented liquid household chlorine bleach (5 to 6% sodium hypochlorite) to 5 parts clean water should be used to treat work surfaces, water faucet and handles, equipment, or other items, including can openers and clothing, that may have come in contact with suspect food or liquid. Spray or wet contaminated surfaces with this bleach solution and let stand for 30 minutes. Wearing gloves, wipe up treated spills with paper towels, being careful to minimize the spread of contamination. Dispose of these paper towels be placing them in a plastic bag before putting them in the trash. Next, apply the bleach solution to all surfaces, let stand for 30 minutes and rinse. As a last step, thoroughly wash all detoxified countertops, containers, and other surfaces. Discard gloves when the cleaning process is complete. (Note: Bleach is an irritant itself and should not be inhaled or allowed to come in contact with the skin.)
Directions for Canning Vegetables

Caution! Altitude Adjustments: The processing times and pressures given here are those recommended by the U.S. Department of Agriculture. DO NOT DECREASE the processing times or pressures given. At varying altitudes, the PROCESSING TIMES STAY THE SAME, but you must make the following adjustments:

### In a Dial Gauge Pressure Canner
* At altitudes of 0 - 2000 feet, process at 11 pounds pressure.
* At altitudes of 2001 - 4000 feet, process at 12 pounds pressure.
* At altitudes of 4001 - 6000 feet, process at 13 pounds pressure.
* At altitudes of 6001 - 8000 feet, process at 14 pounds pressure.

### In a Weighted Gauge Pressure Canner
* At altitudes of 0 - 1000 feet, process at 10 pounds pressure.
* At altitudes above 1000 feet, process at 15 pounds pressure.

There are NO safe boiling water processing times for any of the vegetables in this publication.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Pack</th>
<th>Preparation</th>
<th>Processing Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beans: Green Snap, Wax, Italian</strong></td>
<td></td>
<td>Hot: Wash; trim ends. Leave whole or break or cut into 1 inch pieces. Cover beans with boiling water and boil 5 minutes.-Pack hot beans into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 20; Quarts 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw: Wash; trim ends. Leave whole or break or cut into 1 inch pieces. Pack beans tightly into hot jars, leaving 1 inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling water.</td>
<td>Pints 20; Quarts 25</td>
</tr>
<tr>
<td><strong>Beans: Lima, Butter, Soy</strong></td>
<td></td>
<td>Hot: Shell and wash young tender beans. Cover beans with boiling water; bring to a boil and boil 3 minutes. Pack hot beans loosely in hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 40; Quarts 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw: Shell and wash young tender beans. Pack beans loosely in hot jars, leaving 1-inch headspace for pints. For quarts, leave 1 1/2 inches if beans are small; 1 1/4 if large. If desired, add 1/2 teaspoon salt per pint. Fill jar with boiling water, again leaving 1-inch headspace. water.</td>
<td>Pints 40; Quarts 50</td>
</tr>
<tr>
<td><strong>Beets</strong></td>
<td>Hot</td>
<td>Cut off tops leaving 1 inch of stem and tap root. Wash. Cover with boiling water; boil until skins slip easily - 15 to 25 minutes, according to size. Skin, trim tap root and stem. Can baby beets whole; cut medium and large beets in 1/2 inch cubes or slices. Halve or quarter large slices. Pack hot beets into hot jars leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling water.</td>
<td>Pints 30; Quarts 35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw: Wash, peel and re-wash carrots. Baby carrots can be left whole; slice or dice larger ones. Cover with boiling water, bring to a boil, boil 5 minutes. Pack hot carrots into jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 25; Quarts 30</td>
</tr>
<tr>
<td><strong>Carrots</strong></td>
<td>Hot</td>
<td>Wash, peel and re-wash carrots. Baby carrots can be left whole; slice or dice larger ones. Cover with boiling water, bring to a boil, boil 5 minutes. Pack hot carrots into jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 25; Quarts 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw: Wash, peel and re-wash carrots. Baby carrots can be left whole; slice or dice larger ones. Pack carrots tightly into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling water.</td>
<td>Pints 25; Quarts 30</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Pack</td>
<td>Preparation</td>
<td>Processing Time (minutes)</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Corn: Cream-</td>
<td>Hot</td>
<td>Shuck, silk and wash corn. Blanch ears 4 minutes in boiling water. Cut from cob at about center of kernel; scrape cobs. Add 1 cup boiling water to each 2 cups of corn. Boil 3 minutes. Pack hot corn into jars, leaving 1-inch headspace. If desired add 1 teaspoon salt per pint.</td>
<td>Pints 85</td>
</tr>
<tr>
<td>Style (use pint</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>jars only)</td>
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<td></td>
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<tr>
<td>Corn: Whole</td>
<td>Hot</td>
<td>Note: Some sweet corn varieties will turn very dark after canning. Do not reduce the processing time or pressure. Ask your seed company or farmer if the corn you have is a variety recommended for canning. Shuck, silk and wash corn. Blanch 3 minutes in boiling water. Cut from cob at about 2/3's depth of kernel. Do not scrape cobs. Add 1 cup boiling water to each 4 cups of corn and bring to a boil. Simmer 5 minutes. Pack hot corn into jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 55</td>
</tr>
<tr>
<td>Kernel</td>
<td></td>
<td></td>
<td>Quarts 85</td>
</tr>
<tr>
<td></td>
<td>Raw</td>
<td>Shuck, silk and wash corn. Blanch 3 minutes in boiling water. Cut from cob at about 2/3's depth of kernel. Do not scrape cobs. Pack corn into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling water.</td>
<td>Pints 55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quarts 85</td>
</tr>
<tr>
<td>Greens:</td>
<td>Hot</td>
<td>Wash thoroughly and cut out tough stems. Blanch 1 pound of greens at a time, until well wilted (about 3 to 5 minutes). Pack hot greens loosely into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 70</td>
</tr>
<tr>
<td>Spinach,</td>
<td></td>
<td></td>
<td>Quarts 90</td>
</tr>
<tr>
<td>Turnip, Mustard</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mixed</td>
<td>Hot</td>
<td>Select your favorite mixture of vegetables, except leafy greens, dried beans, cream-style corn, winter squash or sweet potatoes. (Equal portions of carrots, whole kernel sweet corn, green beans, lima beans, tomatoes and diced zucchini make a good mix). Prepare each vegetable as for canning and cut into the desired sizes. Mix together, cover with boiling water and bring back to a boil. Boil 5 minutes. Pack hot vegetables into jars, leaving 1-inch headspace. Add 1/2 teaspoon salt to each pint jar, if desired. Fill jar to 1 inch from top with boiling liquid.</td>
<td>Pints 75</td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td>Quarts 90</td>
</tr>
<tr>
<td>Okra</td>
<td>Hot</td>
<td>Wash and trim pods. Cut in 1 inch pieces or leave whole. Pre-cook okra for 2 minutes in boiling water. Drain. Pack into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling water.</td>
<td>Pints 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quarts 40</td>
</tr>
<tr>
<td>Peas:</td>
<td>Hot</td>
<td>Shell and wash peas. Cover peas with boiling water; boil 3 minutes. Pack hot into jars, leaving 1-inch headspace for pints, 1 1/2 inch for quarts. If desired, add 1/2 teaspoon salt per pint. Fill jar with boiling cooking liquid, leaving 1-inch headspace.</td>
<td>Pints 40</td>
</tr>
<tr>
<td>Blackeye,</td>
<td></td>
<td></td>
<td>Quarts 50</td>
</tr>
<tr>
<td>Crowder, Field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas:</td>
<td>Hot</td>
<td>Shell and wash peas. Pack loosely in hot jars, leaving 1-inch headspace for pints, 1 1/2 inches for quarts. Do not shake or press down. If desired, add 1/2 teaspoon of salt per pint. Fill jar with boiling water, leaving 1-inch headspace.</td>
<td>Pints 40</td>
</tr>
<tr>
<td>Green or English</td>
<td>Raw</td>
<td>Shell and wash peas. Pack with water and bring to a boil. Boil 2 minutes. Pack hot into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quarts 40</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Pack</td>
<td>Preparation</td>
<td>Processing Time (minutes)</td>
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<tr>
<td>Potatoes:</td>
<td>Hot</td>
<td>Select small or medium-size mature potatoes. For packing whole, choose potatoes 1 to 2 inches in diameter. Wash, pare, cut potatoes into 12 inch cubes, if desired. Place cubes in solution of 1 teaspoon (3000 mg) ascorbic acid and 1 gallon of water to prevent darkening. Drain. Cook whole potatoes for 10 minutes, cubes for 2 minutes in boiling water. Drain. Pack hot into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling water.</td>
<td>Pints 35 Quarts 40</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pumpkin:</td>
<td>Hot</td>
<td>Wash pumpkin, remove seeds and pare. Cut into 1 inch cubes. Add to a saucepot of boiling water, boil 2 minutes. Pack hot cubes into hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling cooking liquid.</td>
<td>Pints 55 Quarts 90</td>
</tr>
<tr>
<td>Cubed (It is</td>
<td></td>
<td>not safe to can strained or mashed pumpkin)</td>
<td></td>
</tr>
<tr>
<td>Squash:</td>
<td></td>
<td>Follow preparation procedures and processing times for cubed pumpkin. DO NOT CAN spaghetti squash. Its flesh does not stay cubed during processing. Spaghetti squash can be frozen.</td>
<td></td>
</tr>
<tr>
<td>Winter (Acorn,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butternut,</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Golden Delicious,</td>
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<td></td>
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</tr>
<tr>
<td>Hubbard, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>Hot</td>
<td>Wash small or medium potatoes; boil or steam until partially soft (15 to 20 minutes). Cool slightly and remove skins. Cut medium potatoes, if needed, so that pieces are uniform in size. Pack hot potatoes in hot jars, leaving 1-inch headspace. If desired, add 1/2 teaspoon salt per pint. Fill jar to 1 inch from top with boiling water or syrup made from 1 to 1 3/4 cups sugar and 4 cups water.</td>
<td>Pints 65 Quarts 90</td>
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<td>Vegetable Soup</td>
<td>Hot</td>
<td>Choose your favorite vegetable ingredients. Prepare each as you would for a hot pack in canning. Cooked meat or poultry can also be added, if desired. Combine ingredients with hot water, broth, or tomatoes and juice to cover. Boil 5 minutes. If dried beans or peas are used, they MUST be rehydrated first. CAUTION: DO NOT THICKEN OR ADD MILK, CREAM, FLOUR, RICE, BARLEY OR OTHER GRAINS, NOODLES OR OTHER PASTA. These ingredients can slow down the rate of heating and these process times have not been tested for use with soups containing these ingredients. Add salt to taste, if desired. Fill jars halfway with solid mixture. Continue filling with hot liquid, leaving 1-inch headspace. NOTE: Cooked seafood can also be added. If it is, additional processing time will be needed.</td>
<td>Pints 60 Quarts 75</td>
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Edited by Elizabeth L. Andress, Ph.D., and Judy A. Harrison, Ph.D., Extension Foods Specialists.

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