

# Pressure Canning versus Water Bath Canning



## Why Canning Preserves Food

The high percentage of water in most fresh foods makes them very perishable. They spoil or lose their quality for several reasons:

- growth of undesirable microorganisms-bacteria, molds, and yeasts,
- activity of food enzymes and reactions with oxygen,
- moisture loss.

Microorganisms live and multiply quickly on the surfaces of fresh food and on the inside of bruised, insect-damaged, and diseased food.

Proper canning practices include:

- carefully selecting and washing fresh food,
- peeling some fresh foods,
- hot packing many foods,
- adding acids (lemon juice or vinegar) to some foods,
- using acceptable jars and self-sealing lids,
- processing jars in a boiling-water or pressure canner for the correct period of time.

Collectively, these practices remove oxygen; destroy enzymes; prevent the growth of undesirable bacteria, yeasts, and molds; and help form a high vacuum in jars. Good vacuums form tight seals which keep liquid in and air and microorganisms out.

## Which Canning Method Should I Use for What Type of Foods

In short, the difference between pressure canning and water bath canning is that pressure canning cans **low-acid foods** while the water bath method is used to can **high-acidic foods**. A pressure canner also heats the product at a higher temperature than a water bath canner.

When done correctly, both of these canning methods are effective. It just depends on what type of food you want to can and its level of acidity. Remember, that the lower the value the more acidic it is.

# Acid & Canning: pH Values of Various Foods

## Reference Guide

www.adomesticwildflower.com



### Below 4.5

apples 3.3 - 4	lemons 2.2 - 2.4
apricots 3.3 - 4	limes 1.8 - 2
blackberries 3.2 - 4.5	nectarines 3.9
blueberries 3.7	oranges 3 - 4
cherries 3.2 - 4.1	peaches 3.4
cranberries 2.3 - 2.5	pomegranates 3
currants (red) 2.9	quince 3.1 - 3.3
gooseberries 2.8 - 3.1	raspberries 3.2 - 3.7
grapes 3.4 - 4.5	rhubarb 3.1 - 3.4
grapefruit 3 - 3.3	strawberries 3 - 3.5
	tangerines 4

### Above 4.5

artichokes 5.6	horseradish 5.4
asparagus 4 - 6	kale 6.4 - 6.8
bananas 4.5-5.2	leeks 5.5 - 6
beans 4.6 - 6.2	okra 5.5 - 6.4
beets 4 - 5.6	onions 5.3 - 5.8
brussel sprouts 6	papaya 5.2-5.7
cabbage 5.2 - 6.9	parsley 5.7-6
cantaloupe & melon 5.5- 7.1	parsnip 5.3
carrots 4.9 - 6.4	peas 5.8-7
cauliflower 5.6	papaya 5.2-5.7
celery 5.7 - 6	potatoes 5.3-6.1
chives 5.2 - 6.1	pumpkin 4.8-5.2
corn 6 - 7.5	radishes 5.5-6.5
cucumbers 5.1 - 5.7	spinach 5.5-7.2
dates 6.3-6.6	squash 5.5-6.2
eggplant 4.5 - 5.3	turnips 5.2-5.5
	zucchini 5.8-6.1

### Close to 4.5

figs 4.6
pineapple 3.3 - 5.2
plums 2.8 - 4.6
prunes 3.1 - 5.4
tomatoes 3.5 - 4.9

### Extras

Cocoa 6.3
Honey 3.9
Sugar 5 - 6
Vinegar 2 - 3.4

# Levels of Acid or Alkalinity in Foods

Whether food should be processed in a pressure canner or boiling-water canner to control botulinum bacteria depends on the acidity of the food. Acidity may be natural, as in most fruits, or added, as in pickled food. Low-acid canned foods are not acidic enough to prevent the growth of these bacteria. Acid foods contain enough acid to block their growth or destroyed more rapidly when heated. The term "pH" is a measure of acidity; the lower its value, the more acid in the food. The acidity can be increased by adding lemon juice, citric acid, or vinegar.

Low-acid foods have pH values higher than 4.6. They include red meats, seafood, poultry, milk, and all fresh vegetables except for most tomatoes. Most mixtures of low-acid and acid foods also have pH values above 4.6 unless their recipes include enough lemon juice, citric acid, or vinegar to make them acid foods. Acid foods with a pH of 4.6 or lower include fruits, pickles, sauerkraut, jams, jellies, and marmalades.

Although tomatoes usually are an acid food, some are now known to have pH values slightly above 4.6. Figs also have pH values slightly above 4.6. Therefore, if they are to be canned as acid foods, these products need lemon juice or citric acid added. Properly acidified tomatoes and figs are acid foods and can be safely processed in a boiling-water canner.

Botulinum spores are very hard to destroy at boiling-water temperatures; the higher the canner temperature, the more easily they are destroyed. Therefore, all low-acid foods should be sterilized at temperatures of 240° to 250°F, attainable with pressure canners operated at 10 to 15 pounds per square inch of pressure as measured by a gauge. At temperatures of 240° to 250°F, the time needed to destroy bacteria in low-acid canned food ranges from 20 to 100 minutes.

## Everything you need to know about canning and food preservation is online.

Everything you need to know about canning and food preservation is available in USDA's Complete Guide to Home Canning. This resource is for people canning for the first time or for experienced canners wanting to improve their canning practices. The information is based on research conducted by the National Center for Home Food Preservation in cooperation with USDA's National Institute of Food and Agriculture (NIFA).

United States Department of Agriculture – Complete Guide to Home Canning

[USDA's Complete Guide to Home Canning | National Institute of Food and Agriculture](#)

## VIDEO INSTRUCTION & OTHER LINKS

The Little Country Cabin: Hot Water Bath Canning vs Pressure Canning, safely using each method.  
[\(2112\) Waterbath Canning vs Pressure Canning - The what, why, and how to can safely with each method. - YouTube](#)

FCS Agent, Matti Cornelius as she discusses the differences between water bath canning and pressure canning.

[\(2110\) Canning: Water Bath vs Pressure Canner - YouTube](#)

National Center for Home Food Preservation

[National Center for Home Food Preservation \(uga.edu\)](#)

Clemson University – Home and Garden: Canning at Home Info

[Canning Foods at Home | Home & Garden Information Center \(clemson.edu\)](#)

## Water-bath Canning (also called Cold Pack Canning) – Tips and Instructions

\*\*\* Before you begin – Clean your bottles and lids (I use my dish washer). Then sterilize your jars, seals and lids by boiling them in water, along with the seals and lids.

### Fruits: Apricots, Peaches, Pears and Cherries

Peel (If you put the fruit in really hot water for 10 -15 min. the skin will remove very easy) You don't need to peel Apricots though), core or remove pit. Then slice in half or in smaller slices and place in the jars (fill the jar almost to the top with fruit stop just where it begins to form the neck of the jar). Add 3/4 to 1 cup of sugar (or even less if you choose) and then fill with warm water (only up to the where the jar begins to form the neck). Do not put past that or as it boils it will boil out and make it that the seal will not seal as well) use a knife and run down the side of the jar to make sure the water gets around all the fruit and the air bubbles are out. Wipe the rim of the jar off with a clean cloth to make sure there is no sugar on the rim. Place on the seal and the ring. Make sure the ring is screwed as tight as you can do it. Place the jar into your cold pack canner basket. Let them sit there while the water comes to a boil. Then once the water is boiling lower the bottles down into the water and process **PINTS 25 minutes and QUARTS 30 minutes. Adjust 5 min. for every 1001-3000 feet.** (when you lower them into the boiling water make sure the water is not covering the top of the jars). Once processing is completed raise the basket up and lift each jar out and place on the counter to cool. You will hear them pop which means they are sealed.

### Berries: Strawberries, Raspberries

Strawberries and Raspberry can be left whole and don't have to be cut up. Place the berries in the jars (fill the jar almost to the top with fruit stop just where it begins to form the neck of the jar). Add 3/4 to 1 cup of sugar (or you can even use less) and then fill with warm water (only up to the where the jar begins to form the neck). Do not put past that or as it boils it will boil out and make it that the seal will not seal as well) use a knife and run down the side of the jar to make sure the water gets around all the fruit and the air bubbles are out. Wipe the rim of the jar off with a clean cloth to make sure there is no sugar on the rim. Put on the seal and the ring. Make sure the ring is screwed as tight as you can do it. Place the jar into your cold pack canner basket. Let them sit there while the water comes to a boil. Then once the water is boiling lower the bottles down into the water and process PINTS 15 minutes and QUARTS 20 minutes. Adjust 5 min. for every 1001-3000 feet. (when you lower them into the boiling water make sure the water is not covering the top of the jars). Once processing is completed raise the basket up and lift each jar out and place on the counter to cool. You will hear them pop which means they are sealed.

**NECTAR** Apricot, Peach and Pear: You do not even need to peel just slice and remove the pits or core. Throw into a large soup pan or your largest pan and add about 1-2 cups of water depending on how large of a batch you do. Bring them to a boil stirring often to make sure it doesn't stick to the bottom of the pan, simmer until the fruit is tender and soft. Once they are tender place about 4 cups at a time into your colander process using the wood tool push the fruit against the edge of the colander until all that is left are the peels. Lift out the colander and using a rubber spatula scrape down the sides then clean out the peels and keep going until all the fruit has been through your colander. Then place back on the stove and bring to a boil and add water until it is the consistency you want for nectar. Add sugar until you get the taste you want. Once it has boiled and the sugar is dissolved, you will ladle into your clean jars one at a time placing a seal and a lid on the jar. Make sure the ring is as tight as you can do it. You will need to hold the jar with a rag since the juice you are putting in will be very hot. Set aside and the lids will pop as they are sealed.

**NOTE:** (If you feel you can also water-bath these for 15 mins. if you want to make sure they seal well. I have never had to do this)

### Applesauce:

This is done the same way as the nectar except once you have run through the colander and returned to your pan you will add cinnamon and sugar to taste. You can add Red-hot's instead of cinnamon if you would like it will just make it a pink color you will still need to add some sugar too.

**NOTE:** (If you feel you can also water-bath these for 15 mins. if you want to make sure they seal well. I have never had to do this)

**Tomatoes:** From [simplycanning.com](http://simplycanning.com) [Topic Canning Tomatoes](#) (with no pictures though)

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## RAW PACK WHOLE OR HALVED METHOD.... NO WATER ADDED.

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When you are canning tomatoes you have a choice as to how you want to process them. Canning directions for both the **Water-Bath Method And The Pressure Canning** method are included at the end of the page.

**ACIDITY NEEDS TO BE ADDED FOR A WATER-BATH. THIS IS VERY IMPORTANT.**

If you choose to use a water bath canner be sure to use lemon juice in each jar. 1T for each pint, 2 T for each Quart.

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## PREPARE YOUR INGREDIENTS AND CANNING SUPPLIES

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### Gather your canning supplies

Pressure Canner or Cold Pack Canner

jar lifter (optional)

bowls

towels and dish cloths

canning jars

canning funnel (optional)

large spoons

canning seals and rings

large pot or blancher

sharp knife

### Ingredients

Tomatoes

Salt

Lemon Juice

Start by preparing your jars, and getting water in your canner heating.

### **1st Step Is Peeling the Tomatoes.**

Most (not all) of the time when you are canning tomatoes you'll want to first remove the skins. Now this is an optional step. It is perfectly safe to just can them with the skins on. But the skins may be undesirable in some dishes. For the most part.... I skin them. (don't toss the skins! save them for the dehydrator, they make great tomato powder.) Depending on the size of the tomato, blanch 4 to 6 at a time. In these pictures I am working with Roma Tomatoes. I like them for canning because they are meatier than other tomatoes. They are smaller so I can fit more in the blancher. If you have a blancher or blanching basket, that makes it easier but you can also just use a slotted spoon and a big pot of boiling water.

**1-** Wash tomatoes and dip in boiling water for 30-60 seconds or until you see the skins split. Start counting as soon as your tomatoes hit the water. Don't wait for the water to come back to a boil to start your count time.

**2-**When you remove the tomatoes, drop immediately into sink or bowl of cold water to stop the cooking.

**3-**Slip off skins and quarter tomatoes. The skins should just slide off in your hands. Occasionally I'll use a knife on some stubborn spots.

Optional method to peel your tomatoes... freeze them first.

### **\*\*\*\*\*Very Important\*\*\*\*\***

**If you are canning tomatoes in a water bath canner, add bottled lemon juice or citric acid to the jars. 1T per pint, 2T per quart.** Add 1 teaspoon of salt per quart to the jars, if desired.

As you skin the tomatoes slice them in halves or quarters as you prefer. I will sometimes even leave my Roma tomatoes whole. Place them directly into your jars. Your jars should be warm when you are working with your tomatoes. I'll usually just have them in a sink or pan of hot water. You can also run a dishwasher rinse cycle with the jars and then leave them in the steamy dishwasher until you are ready to fill each one.

Press down on the tomatoes in the jar until spaces between them fill with juice. This will crush them slightly. Leave 1/2-inch head space. Repeat steps until all tomatoes are skinned and chopped. You may need to let your water come back to heat in between batches in the blancher.

Remove air bubbles with a small utensil. I find an orange peeler works great for this step. I also use a dinner knife.

Be sure and wipe the rims of your jars clean before placing your lids on. If there are bits of food it may interfere with the seal.

Place lids on the jars and process according to [Water bath](#) or [Pressure Canning instructions](#).

Remember how your jars were hot when you filled them? They will most likely cool when you add the tomatoes. Thus you should have the water in your canner warm/hot but not boiling hot. You don't want a drastic change in temperature. Canning jars are pretty sturdy, so they will handle some temperature change... but I'd still not risk placing cool or even room temperature jars in boiling water.

So have the canner water hot but not boiling when you fill it with the jars.

Now keep in mind these are raw packed in their own juice. You should not add water to your jars. If you add water you change the acidity and there are different processing instructions.

Also keep in mind, these tomatoes will float. It is just a fact of this method of canning. Tomatoes will end up at the top of the jars after processing with more liquid at the bottom.

**Processing directions; time and pressure requirements: Processing for a Pressure canner.** Process both pints or quarts - process for 25 minutes. Be sure to adjust processing according to your altitude. See this [altitude adjustments](#) page.

Adjustments for Pressure Canner		
Altitude in Feet	Dial Gauge Canner	Weighted Gauge Canner
0-1000	11	10
1001-2000	11	15
2001-4000	12	15
4001-6000	13	15
6001-8000	14	15
8000-10,000	15	15

**Processing for a water-bath canner.** Processing for a Water bath Canner Be sure to add lemon juice to each jar. Be sure to adjust processing according to your altitude. For more information see this [altitude adjustments](#) page.

Process both pints or quarts **85 minutes**.

Altitude Adjustments for Boiling Water Bath Canner	
Altitude in Feet	Increase processing time
1001-3000	5 minutes
3001-6000	10 minutes
6001-8000	15 minutes
8001-10,000	20 minutes

**Meatless Spaghetti Sauce:** Can be done with the Water-bath canner. BUT If you add meat you will have to use a pressure cooker to process. Go to <http://www.simplycanning.com> for the directions.