

Home Canning Pressures and Processing Times

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MontGuide

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Time charts and instructions to ensure safety of home-canned foods.

SAFETY IS THE TOP PRIORITY for the United States Department of Agriculture's home canning guidelines, and the USDA guidelines included in this MontGuide are based on extensive research on safe processing pressures and times. Among the safety factors, the USDA's primary goal is the prevention of **botulism**, a potentially deadly foodborne illness caused by a spore of the bacteria **C. botulism**, one of the most deadly poisons. **C. botulism** can grow and reproduce in improperly processed home canned foods.

The guidelines presented here will also help prevent foodborne illnesses caused by other bacteria, molds and yeast, and will help prevent food spoilage in your home canned products.

Two Questions of Safety

Before beginning your home canning, ask yourself:

1. *What is my elevation?*

In order to decrease your risk of food-related illness and death, you must determine the correct home-canning processing times and pressures for your level of elevation. While water boils at 212° F at sea level, it boils at a much lower temperature at higher elevations. Consequently, home canned foods must be processed for longer times or at a higher pressure at higher altitudes.

2. *Is the food I am home canning a high-acid or low-acid food?*

This information will help you determine the type of equipment you will need: either a pressure canner or boiling water bath.

Low-acid foods include vegetables (except tomatoes), meats, poultry and fish. Acidity helps protect foods from poison-causing bacteria and food spoilage, and because

these foods have little natural acidity, they must be processed at higher temperatures and pressures that can only be achieved by pressure canners.

On the other hand, fruits and tomatoes are naturally high-acid foods that can be processed in either a boiling water bath or pressure canner.

Other Resources

This guide provides information on processing times and temperatures with additional tips on key safety points for home canning. It is not meant to provide all the safety information and directions needed for canning. The following resources are available for more safety information and instructions for home canning:

So Easy to Preserve, University of Georgia Extension Service, Agriculture Business Department.
Send \$15 to 203 Conner Hall, Athens, GA 30602.

Ball Blue Book, 1995. Home Canners Catalog, Alltrista Corp., P.O. Box 2005, Muncie, IN 47307. \$4.95 + \$1 S&H.



Following are several critical checkpoints in the safe preparation and storage of home canned foods:

PACKING

Style of pack: Follow directions for packing either hot or raw pack.

Jar size: Follow directions for packing in either 1/2 pint, pint or quart jars.
(NOTE: Not all foods can be safely processed in quart jars. Therefore, not all foods will designate quart directions.)

Head space: Follow directions for specific foods.

PROCESSING

NOTE: Do not use micro-canners, steam canners, open kettle, oven canning or preservatives for processing.

Use a pressure canner for low-acid foods (vegetables, meats, poultry and fish)

- Test your dial gauge at least once per year. Weighted gauges do not need testing.
- Canners must be vented for 10 minutes to exhaust air. Excess air will keep the canner pressure and temperature too low for safe processing.
- Start processing time when pressure reaches 10 pounds for weighted gauge; 11 points for dial gauge canners.
- Adjust pressure and times for altitude.

Use boiling water canning for high-acid foods only (fruits, tomatoes and pickled products)

- Start timing as soon as water returns to boil and be sure jars are covered with one inch of boiling water and are placed on a 1/2 inch rack.
- Adjust processing times for altitude.

COOLING

Pressure canner: Remove canner from stove, cool at room temperature until pressure returns to zero, then promptly remove jars.

Boiling water canner: Remove jars from canner after processing time.

- Place jars on rack or cloth so air can circulate. Do not expose to draft or cover with towels.

SEALING

- Cooled jars should have the center of the lid popped down and not moveable when pressed.**
- Jars that have not sealed should be repacked and reprocessed for the original processing pressure and time. If not reprocessed, foods may also be refrigerated or frozen.

CONSUMING

- If you are uncertain about the safety of home-canned foods, follow the advice **“When in doubt, throw it out.”**
- Botulism and other deadly foodborne illness causes are undetectable in food by sight, smell and taste. Foods may show no sign of spoilage! If a canned food looks spoiled, foams or even has an “off” odor, destroy it. To be sure foods are safe from botulism, boil them at the proper time for your elevation. At elevations above 1,000 feet, **start with 10 minutes and add one additional minute per 1,000 feet of elevation.**

Processing Times and Pressures for Pressure Canner

Low-Acid Vegetables, Meats and Poultry

Vegetables	Minutes to Process		Pint	Quart
Asparagus , spears or pieces, raw or hot pack	30		40	
Beans or peas , shelled, dried, hot pack only	75		90	
Beans , baked (see Beans, dry)				
Beans , dry, with tomato or molasses sauce, hot pack only.....	65		75	
Beans , fresh lima—shelled, raw or hot pack.....	40		50	
Beans , snap and italian—pieces, raw or hot pack.....	20		25	
Beets , whole, cubed, or sliced, hot pack only	30		35	
Carrots , sliced or diced, raw or hot pack.....	25		30	
Corn , cream style, hot pack only	85		NO*	
Corn , whole kernel, raw or hot pack	55		85	
Mixed vegetables , hot pack only	75		90	
Mushrooms , whole or sliced, hot pack (½ pint same as pint)..	45		NO*	
NOTE: Wild mushrooms can not be canned safely.				
Peas , green or english, shelled, raw or hot pack	40		40	
Peppers , hot pack only (½ pint same as pint).....	35		NO*	
Potatoes , sweet, pieces or whole, hot pack only	65		90	
Potatoes , white, cubed or whole, hot pack only	35		40	
Pumpkin and winter squash , cubed, hot pack only	55		90	
Spinach and other greens , hot pack only	70		90	
Squash , winter, cubed (see Pumpkin)				
Succotash , raw or hot pack.....	60		85	
Meats				
Chicken or rabbit , cut up, without bones, raw or hot pack.....	75		90	
Chicken or rabbit , cut up, with bones, raw or hot pack.....	65		75	
Ground or chopped meat , hot pack only.....	75		90	
Strips , cubes or chunks of meat, raw or hot pack	75		90	
Meat stock (broth) , hot pack only	20		25	
Fish , raw pack only	100		NO*	
Smoked fish	110		NO*	
*These foods can not be processed safely in quart jars.				

STEPS

- 1.** Follow directions for hot pack or raw pack.
- 2.** Follow directions for head space. (NOTE: Head space is 1 inch for vegetables and all meats except chicken and rabbit, which is 1 1/2 inch.)
- 3.** Determine processing time.
- 4.** Determine pressure based on elevation for either dial or weighted gauge pressure.
 - a. Dial Gauge Canner:**

Altitude	Pressure
2000-4000 feet	12
4000-6000 feet	13
6000-8000 feet	14
 - b. Weighted Gauge Canner:**
Use 15 pounds. (Note: 15 pounds required for all elevations above 1,000 feet.)

ELEVATIONS OF COUNTY SEATS IN MONTANA AND POUNDS OF PRESSURE TO USE								
County Seat	Elevation	Lbs. Pressure	County Seat	Elevation	Lbs. Pressure	County Seat	Elevation	Lbs. Pressure
Anaconda	5288	13	Fort Benton	2749	12	Plentywood	2044	12
Baker	2945	12	Glasgow	2093	12	Polson	2935	12
Big Timber	4075	13	Glendive	2076	12	Red Lodge	5554	13
Billings	3117	12	Great Falls	3330	12	Roundup	3186	12
Boulder	4904	13	Hamilton	3571	12	Ryegate	3638	12
Bozeman	4753	13	Hardin	2900	12	Scobey	2475	12
Broadus	3029	12	Harlowton	4162	13	Shelby	3283	12
Butte	5767	13	Havre	2489	12	Sidney	1931	11
Chester	3132	12	Helena	4009	13	Stanford	4259	13
Chinook	2429	12	Hysham	2653	12	Superior	2759	12
Choteau	3810	12	Jordan	2595	12	Terry	2246	12
Circle	2449	12	Kalispell	2956	12	Thompson Falls	2473	12
Columbus	3584	12	Lewistown	3912	12	Townsend	3828	12
Conrad	3511	12	Libby	2065	12	Virginia City	5822	13
Cut Bank	3751	12	Livingston	4499	13	W. Sulphur Sp.	5100	13
Deer Lodge	4520	13	Malta	2258	12	Wibaux	2661	12
Dillon	5097	13	Miles City	2371	12	Winnett	2958	12
Ekalaka	3427	12	Missoula	3208	12	Wolf Point	2009	12
Forsyth	2521	12	Phillipsburg	5163	13			

Processing Time for Fruits, Acid Vegetables and Pickled Products in Boiling Water Canner

Minutes to Process, at Altitudes (in feet) of:

Food and Kind of Pack	Size	1000-1999	2000-2999	3000-3999	4000-4999	5000-5999	6000-6999	7000-7999
Apple butter , hot pack	1/2 pint, pint	10	10	10	10	10	15	15
Apple juice , hot pack	pint & quart	10	10	10	10	10	15	15
Apples , hot pack	pint & quart	25	25	30	30	30	35	35
Applesauce , hot pack	pint	20	20	20	20	20	25	25
	quart	25	25	30	30	30	35	35
Spiced apple rings , hot pack	1/2 pint, pint	15	15	15	15	15	20	20
Spiced crab apples , hot pack	pint	25	25	30	30	30	35	35
Apricots , halved or sliced	(Follow directions for peaches)							
Berries , hot pack	pint & quart	20	20	20	20	20	25	25
Berries , raw pack	pint	20	20	20	20	20	25	25
	quart	25	25	30	30	30	35	35
Berry or fruit syrup , hot pack	1/2 pint, pint	15	15	15	15	15	20	20
Cherries , hot pack	pint	20	20	20	20	20	25	25
	quart	25	25	30	30	30	35	35
Cherries , raw pack	pint & quart	30	30	35	35	35	40	40
Fruit puree , hot pack ★	pint & quart	20	20	20	20	20	25	25
Grape juice , hot pack ★	pint & quart	10	10	10	10	10	15	15
Peaches , hot pack	pint	25	25	30	30	30	35	35
	quart	30	30	35	35	35	40	40
Peaches , raw pack	pint	30	30	35	35	35	40	40
	quart	35	35	40	40	40	45	45
Pears , halved, hot pack	pint	25	25	30	30	30	35	35
	quart	30	30	35	35	35	40	40
Plums , halved or whole, raw or hot pack	pint	25	25	30	30	30	35	35
	quart	30	30	35	35	35	40	40
Rhubarb , stewed, hot pack	pint & quart	20	20	20	20	20	25	25
Tomatoes , raw, pressed in, no added liquid ★ ★	pint & quart	90	90	95	95	95	100	100
Tomato juice , hot pack ★ ★	pint	40	40	45	45	45	50	50
	quart	45	45	50	50	50	55	55
Sauerkraut , raw pack	pint	25	25	30	30	30	35	35
	quart	30	30	35	35	35	40	40
Sauerkraut , hot pack	pint	15	15	15	15	15	20	20
	quart	20	20	20	20	20	25	25
Sweet Gherkins , raw pack	pint	10	10	10	10	10	15	15
Dilled green or yellow beans , raw	pint	10	10	10	10	10	15	15
Pickled beets , hot pack	pint & quart	35	35	40	40	40	45	45
Piccalilli or chow chow , hot	1/2 pint, pint	10	10	10	10	10	15	15
Corn relish or 3-bean , hot	1/2 pint, pint	20	20	20	20	20	25	25
Dill pickles , raw pack	pint	15	15	15	15	15	20	20
	quart	20	20	20	20	20	25	25
Bread & butter pickles , hot	pint & quart	15	15	15	15	15	20	20
Pickle relish , hot pack	1/2 pint, pint	15	15	15	15	15	20	20
Pickled mixed vegetables hot	quart	15	15	15	15	20	20	20

★ = 1/4 inch head space; all others are 1/2 inch.

★★ = Add 1 Tablespoon lemon juice or 1/4 tsp. citric acid per pint. Double amount for quart.



<http://www.montana.edu/wwwpb/pubs/mt8329hr.html>

STEPS

1. Determine hot pack or raw pack.
2. Determine head space. (Note: All foods on this list are 1/2 inch except for those marked with a H.)
3. Determine processing time based on elevation. (Elevation chart on page 3)

Processing Jelly, Jam, Preserves, Marmalades and Butters

Use of paraffin is no longer recommended for jelly, jam or other similar products because of possible mold toxin. All should be canned in regular canning jars and processed in a boiling water bath.

Processing Time in Boiling Water Canner:

Sterile Jars: 5 minutes below 1,000 feet; add one minute per 1,000 feet of elevation.

Unsterile jars: Ten minutes below 1,000 feet of elevation; add one minute per 1,000 feet of elevation. Head space is 1/4 inch.

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