A Self-Learning Resource From MSU Extension

MONTANA STATE UNIVERSITY EXTENSION MontGuide

Home-canning Meat, Poultry and Fish

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This Montguide lists canning pressures for specific altitudes throughout Montana and recommended processing times for various meats. It includes a checklist for safe preparation and storage of home-canned foods, and instructions for canning meat, poultry and fish.

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Safety is the Top Priority

Safely canning foods at home requires using processing methods that not only preserve the food but also destroy bacteria and molds that cause foodborne illness, such as botulism. Botulism, caused by a toxin of the bacteria *Clostridium Botulinum*, can be fatal. This bacteria can grow and reproduce in improperly processed home-canned foods. Protect yourself and others when sharing home-canned foods by learning safe preservation techniques. The safest recipes and resources are those that have been researched and rigorously tested by the United States Department of Agriculture (USDA) and Extension Services associated with land-grant universities. Many home-preserved recipes are not tested for safety, so it is critical to use the resources located below.

Recommended Research-based Food Preservation Resources

National Center for Home Food Preservation (NCHFP), USDA sponsored website is the most current source for publications, video clips, tutorials for the beginning home food preserver, frequently asked questions, and seasonal tips: http://nchfp.uga.edu/

USDA Complete Guide to Home Canning, 2015. Available on NCHFP website, above, click on 'publications.'

So Easy to Preserve, 6th edition only, 2014. MSU Extension does not recommend earlier editions. http://www.soeasytopreserve.com

Free Canning Timer & Checklist app https://catalog.extension.oregonstate.edu/pnw689

The following publications are available at local stores or order online: *The All New Ball Blue Book of Canning and Preserving,* 1st ed., 2016; *The Best Ball Home Canning and Preserving Recipes: Fresh Flavors All Year Long,* 1st ed. 2016; *Ball Blue Book Guide to Preserving,* 37th ed., 2014. Earlier editions not recommended.

A Question of Safety

Before beginning home-canning, ask yourself, 'What is my altitude?' In order to decrease risk of food-related illness and death, 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, when home-canning meat, poultry and fish, ALWAYS use a pressure canner (never use a boiling water canner). Only pressure canners can reach the 240°F required to destroy *C. Botulinum*. (Refer to Table 1.)

TABLE 1. Altitudes* of County Seats in Montana

County Seat	Elevation	County Seat	Elevation
Anaconda	5239	Hysham	2618
Baker	2968	Jordan	2640
Big Timber	4199	Kalispell	2984
Billings	3153	Lewistown	3936
Boulder	4938	Libby	2198
Bozeman	4806	Livingston	4557
Broadus	3091	Malta	2275
Butte	5539	Miles City	2362
Chester	3162	Missoula	3232
Chinook	2411	Phillipsburg	5357
Choteau	3799	Plentywood	2068
Circle	2500	Polson	2930
Columbus	3599	Red Lodge	5562
Conrad	3523	Roundup	3198
Cut Bank	3793	Ryegate	3775
Deer Lodge	4609	Scobey	2461
Dillon	5118	Shelby	3300
Ekalaka	3494	Sidney	1967
Forsyth	2510	Stanford	4288
Fort Benton	2698	Superior	2813
Glasgow	2088	Terry	2228
Glendive	2053	Thompson Falls	2519
Great Falls	3398	Townsend	3869
Hamilton	3625	Virginia City	5804
Hardin	2903	W. Sulphur Spr.	5091
Harlowton	4185	Wibaux	2650
Havre	2493	Winnett	2975
Helena	4068	Wolf Point	2043

*accessed March, 2017 http://geoinfo.msl.mt.gov/geography/geography_facts/elevation_of_montana_cities.aspx

SAFE EQUIPMENT

- ❑ Jar lifters
- ❑ Canning jars and lids
- ❑ Canning funnels
- ❑ Non-metallic spatulas

Pressure canners are used for low and high acid foods. There are two types of pressure canners: dial gauge and weighted pressure gauge. Of the two types of pressure canners, a dial gauge pressure canner allows more flexibility in pressure settings needed for altitude adjustments, therefore the quality of the product may be higher than when using a weighted gauge canner where pressure is not as precise. Dial gauge canners must be tested yearly to ensure accurate readings. Contact your local county Extension agent, hardware store, or the Presto Company for free gauge testing. Contact Presto at 1-800-877-0441 or https://www.gopresto.com/ for instructions.

Equipment and methods *not* recommended: Processing of freshly filled jars in conventional ovens, microwave ovens, dishwashers, pressure cooker/sauce pans and open-kettles are not recommended because they will not prevent growth of deadly botulism. Jars with wire bails and glass caps, one-piece zinc, or porcelain-lined caps are not recommended.

PREPARING AND PACKING

Preparing: Preparation procedures vary. Follow recipe directions.

Style of pack: Many fresh foods contain 10-30 percent air. Hot packed foods will remove more air from the foods, prevent floating of food, and yield a higher quantity than raw packing.

Raw Pack: Foods are not cooked or heated in any way prior to packing. In a raw pack, raw food is placed directly in the jars. Then hot, boiling liquid is poured over the contents. Pack firmly, but do not crush. Free the bubbles or trapped air between the pieces of food.

Hot pack: Heating the food to boiling or cooking the food for a specified amount of time and then packing the hot food into the jar and adding boiling liquid to cover the food. Since shrinkage will already have occurred, the food should be packed loosely.

Jar size: Follow directions for packing in either ½ pint, pint or quart jars.

Head space: Follow recipe directions.

Lids: Follow manufacturer's directions for lids.

PROCESSING

Follow manufacturer's directions for pressure canners, except ALWAYS vent your pressure canner even if manufacturer does not recommend or include directions. Important: if processing is interrupted, start again using the same method, timing and pressure as in the original directions.

- ❑ Determine pressure and times for altitude. See Tables 1, 2 and 3.
- ❑ Fasten the canner lid securely. Leave the weight off the vent pipe. To vent your canner, turn the heat setting to its highest position. Heat until the water boils and steam flows freely in a funnel-shape from the open vent pipe. While maintaining the high heat setting, continue to vent for a full 10 minutes. Place gauge on vent pipe. The canner should pressurize within 5 minutes. After gauge reaches recommended pressure, adjust heat to maintain the pressure for the entire processing period. Set the timer for the length stated in the recipe. Frequently check to make sure the correct pressure is maintained.

COOLING and SEALING

- ❑ Remove pressure canner from stove, cool at room temperature until pressure returns to zero. Do not force the canner by opening vent, removing weight, or running under cold water. After canner is completely depressurized, remove the weight or open the vent. Wait 10 minutes, then unfasten the pressure canner lid and remove carefully.
- ❑ Place jars on rack or cloth so air can circulate. Never tip a jar to remove water from lid. Do not cover with towels or expose to drafts. Do not touch or tighten lids. Jars will cool within 12 hours. Note: If lids do not seal, jars should be reprocessed with new lids using the original processing method and time within 24 hours. If not reprocessed, refrigerate or freeze food quickly and use these foods first.

STORING

After jars are sealed and cool, remove rings. Wash and label jars. Store in cool, dry, dark place. Best quality if used within one year. If seals fail while in storage, food should be discarded. Do not taste.

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 not detected 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, dispose of it.

CHICKEN OR RABBIT

Caution: Fresh poultry or rabbit should be chilled and canned without delay. Do not can meat from diseased or unhealthy animals.

Procedure: Choose freshly killed and dressed, healthy animals. Dressed chicken should be chilled for 6 to 12 hours before canning. Dressed rabbits should be soaked 1 hour in water containing 1 tablespoon of salt per quart, and then rinsed. Remove excess fat. Cut the chicken or rabbit into suitable sizes for canning. Can with or without bones.

Hot pack: Boil, steam, or bake meat until about two-thirds done. Add 1 teaspoon salt per quart to the jar, if desired. Fill jars with pieces and hot broth, leaving 1¼ inch headspace.

The hot pack is preferred for best liquid cover and quality during storage. Natural poultry fat and juices are usually not enough to cover the meat in raw packs. http://nchfp.uga.edu/how/can_05/chicken_rabbit.html.

Raw pack: Add 1 teaspoon salt per quart, if desired. Fill jars loosely with raw meat pieces, leaving 1¼ inch headspace. Do not add liquid.

Wipe rims of jars with a damp, clean paper towel. Adjust lids and process.

GROUND OR FINELY CHOPPED MEAT

Bear, beef, lamb, pork, sausage, veal, venison

Caution: Fresh red meats should be chilled and canned without delay. Do not can meat from diseased or unhealthy animals.

Procedure: Choose fresh, chilled meat. With venison, add one part high-quality pork fat to three or four parts venison before grinding. Use freshly made sausage, seasoned with salt and cayenne pepper (sage may cause a bitter off-flavor). Shape chopped meat into patties or balls or cut cased sausage into 3 to 4 inch links. Cook until lightly browned. Ground meat may be sauteed without shaping. Remove excess fat. Fill jars with pieces. Add boiling meat broth, tomato juice, or water, leaving 1 inch headspace. Add 1 teaspoon of salt per quart to the jars, if desired.

Wipe rims of jars with a damp, clean paper towel. Adjust lids and process.

STRIPS, CUBES, OR CHUNKS OF MEAT

Bear, beef, lamb, pork, veal, venison

Procedure: Choose quality chilled meat. Remove excess fat. Soak strong-flavored wild meats for 1 hour in brine water containing 1 tablespoon of salt per quart. Rinse. Remove large bones.

TABLE 2. Recommended processing times for meats in a dial-gauge pressure canner. See Table 1 for altitude.

	Style of Pack	Jar*	Processing Time	0-2000 ft.	2001-4000 ft.	4001-6000 ft.	6001-8000 ft.
Chicken or Rabbit (no bones)	Hot and Raw	Pints	75 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts	90 min.	11 lb.	12 lb.	13 lb.	14 lb.
(with bones)		Pints	65 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts	75 min.	11 lb.	12 lb.	13 lb.	14 lb.
Ground or chopped meat	Hot	Pints	75 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts	90 min.	11 lb.	12 lb.	13 lb.	14 lb.
Strips, cubes or chunks of meat	Hot and Raw	Pints	75 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts	90 min.	11 lb.	12 lb.	13 lb.	14 lb.
Fish	Raw	Pints	100 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts**	—	—	—	—	—
Smoked fish		Pints***	110 min.	11 lb.	12 lb.	13 lb.	14 lb.
		Quarts	No safe processing recommendations are available for smoked fish in quarts.				

TABLE 3. Recommended processing times for meats in a weighted-gauge pressure canner. See Table 1 for altitude.

	Style of Pack	Jar*	Processing Time	0-1000 ft.	Above 1000 ft.
Chicken or Rabbit (no bones)	Hot and Raw	Pints	75 min.	10 lb.	15 lb.
		Quarts	90 min.	10 lb.	15 lb.
(with bones)		Pints	65 min.	10 lb.	15 lb.
		Quarts	75 min.	10 lb.	15 lb.
Ground or chopped meat	Hot	Pints	75 min.	10 lb.	15 lb.
		Quarts	90 min.	10 lb.	15 lb.
Strips, cubes or chunks of meat	Hot and Raw	Pints	75 min.	10 lb.	15 lb.
		Quarts	90 min.	10 lb.	15 lb.
Fish	Raw	Pints	100 min.	10 lb.	15 lb.
		Quarts**	—	—	—
Smoked Fish		Pints***	110 min.	10 lb.	15 lb.
		Quarts	No safe processing recommendations are available for smoked fish in quarts.		

*If processing with half pints, use same processing time as with pints.

**Directions for canning in quart jars are not available in this Montguide but are found in the USDA *Guide to Home Canning (2015): Preparing and Canning Poultry, Red Meats, and Seafood* on pages 5-11 and 5-12. http://nchfp.uga.edu/publications/usda/GUIDE05_HomeCan_rev0715.pdf.

***Safely canning smoked fish in pints requires distinctly different directions for filling pressure canner than for pressure canning other foods. See page 4 for directions for filling the pressure canner for processing smoked fish.

Hot pack: Precook meat until rare by roasting, stewing or browning in a small amount of fat. Add 1 teaspoon of salt per quart to the jar, if desired. Fill jars with pieces and add boiling broth, meat drippings, water or tomato juice (especially with wild game), leaving 1 inch headspace.

The hot pack is preferred for best liquid cover and quality during storage. The natural amount of fat and juices in today's leaner meat cuts are usually not enough to cover the meat in raw packs. http://nchfp.uga.edu/how/can_05/strips_cubes_chunks.html

Raw pack: Add 1 teaspoon of salt per quart to the jar, if desired. Fill jars with raw meat pieces, leaving 1 inch headspace. Do not add liquid since raw meat forms its own juices.

Wipe rims of jars with a damp, clean paper towel. Adjust lids and process.

FISH IN PINT JARS

NOTE: The following information is for canning fish in pint jars. Information on canning fish in quart jars can be found in the USDA Guide to Home Canning (2015): Preparing and Canning Poultry, Red Meats, and Seafood's on pages 5-11 and 5-12. http://nchfp.uga.edu/publications/usda/GUIDE05_HomeCan_rev0715.pdf

Blue, mackerel, salmon, steelhead, trout, and other fatty fish except tuna

Caution: Eviscerate fish within 2 hours after they are caught. Keep cleaned fish on ice until ready to can.

Note: Glass-like crystals of magnesium ammonium phosphate sometimes form in canned salmon. There is no way for the home-canner to prevent these crystals from forming, but they usually dissolve when heated and are safe to eat.

Procedure: If the fish is frozen, thaw it in the refrigerator before canning. Rinse the fish in cold water. You can add vinegar to the water (2 tablespoons per quart) to help remove slime. Remove head, tail, fins and scales; it is not necessary to remove the skin. Wash and remove all blood and innards. You can leave the bones in most fish because the bones become very soft and are a good source of calcium. For halibut, remove the head, tail, fins, skin and bones. Refrigerate all fish until you are ready to pack in jars.

Split fish lengthwise, if desired. Cut cleaned fish into 3½ inch lengths. If the skin has been left on the fish, pack the fish skin out for a nicer appearance or skin in, for easier jar cleaning. Fill clean jars, leaving 1 inch headspace. Add 1 teaspoon of salt per pint, if desired. Do not add liquids. Carefully clean the jar rims with a clean, damp paper towel; wipe with a dry paper towel to remove any fish oil. Adjust lids and process. Fish in half-pint or 12-ounce jars would be processed for the same amount of time as pint jars.

SMOKED FISH

Salmon, trout, whitefish, walleye, bass, tuna, rockfish, flatfish (sole, cod, flounder)

Caution: Safe home-processing times for other smoked seafoods have not been determined. Those products should be frozen. Smoking of fish should be done by tested methods. Lightly smoked fish is recommended for canning because the smoked flavor will become stronger and the flesh drier after processing. However, because it has not yet been cooked, do not taste lightly smoked fish before canning.

Follow these recommended canning instructions carefully. Use a 16 to 22 quart pressure canner for this procedure. Do not use smaller pressure saucepans since safe processing times have not been determined. Do not use jars larger than one pint. Half-pints could be safely processed for the same length of time as pints, but the quality of the product may be less acceptable.

Procedure: If smoked fish has been frozen, thaw in the refrigerator until no ice crystals remain before canning. If not done prior to smoking, cut fish into pieces that will fit vertically into pint canning jars, leaving 1 inch headspace. Pack smoked fish vertically into clean jars, leaving 1 inch headspace between the pieces and the top rim of the jar. The fish may be packed either loosely or tightly. Do not add liquid to the jars. Clean jar rims with a clean, damp paper towel. Adjust lids and process.

Processing change for smoked fish - The directions for filling the pressure canner for processing smoked fish are different from other pressure canning, so please read the following carefully: It is critical to product safety that the processing directions are followed exactly. When you are ready to process jars of smoked fish, measure 4 quarts (16 cups) of cool tap water and pour into the pressure canner (NOTE: the water level probably will reach the screw bands of pint jars). Do not decrease the amount of water or heat the water before processing begins. Place prepared, closed jars on the rack in the bottom of the canner, and proceed as with usual pressure canning instructions.

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