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# Canning meat at home



In 1935, the Department of Agriculture first published a household bulletin about canning meat, poultry, fish and soup. At that time, home economists considered canning an economical way for farm wives to preserve freshly slaughtered meat. About 10 years later, the United States Department of Agriculture published results of extensive tests on home-canned food and ever since has insisted that all low-acid foods such as meats and vegetables be canned in a pressure canner.

Over the years, Agriculture Canada has continued to develop, test and revise its food preservation instructions. Many people still can food, but freezing has slowly surpassed canning in popularity since the introduction of home freezers.

Freezing meat and poultry is still the method preferred by food experts at Agriculture Canada. Although improper handling and storing of food can cause spoilage or illness with any method, it is of particular concern with canning. Conditions in improperly canned food are ideal for the growth of the deadly botulism bacteria.

## THE DREADED BOTULISM BACTERIA

Canning procedures and processing times must be followed exactly to ensure destruction of the deadly spore-forming bacteria, *Clostridium botulinum*. The bacteria and their spores are everywhere — in the soil, on raw fruits and vegetables and on meat and fish. The spores are extremely resistant to heat. The spores themselves are not dangerous and under most circumstances are inactive. However, under favorable conditions they grow and produce a deadly toxin. Most outbreaks of botulism poisoning have been traced to home-prepared, low-acid foods that had been improperly heat processed, stored in airtight containers and eaten without further cooking — conditions ideal for spore growth.

How can you tell if botulism toxins are in food? Some foods give off a foul odor but others look and smell perfectly normal. Perhaps this is why botulism strikes several Canadians every year.

## CANNING PRINCIPLES

Proper canning procedures guarantee that a food can be stored without refrigeration and safely eaten later on. Canning depends on a combination of high temperature and enough time to remove air and destroy harmful microorganisms. The specific combination of time and temperature depends on many things:

**THE TYPE OF FOOD** The acids in some foods, such as fruits, inhibit many spoilage and disease-producing microorganisms. These foods can be processed in a boiling water bath. However, foods with little acid like vegetables and meats are ideal for growth of spore-forming bacteria such as *Clostridium botulinum* and have to be processed at a temperature above boiling, in a pressure canner.

**THE AMOUNT OF LIQUID** Liquids conduct heat more quickly than solids. All meats in this guide are canned with liquid added.

**HOW TIGHTLY THE FOOD IS PACKED** For example, bone-in chicken heats more quickly than boneless chicken. This is why Agriculture Canada does not recommend canning boneless chicken.

**THE SIZE OF THE CONTAINER** It takes longer to heat a medium-size jar than it does to heat a small jar. Only directions for canning in medium jars are given here.

**THE AMOUNT OF FAT** Fat acts as an insulator, slowing down heat penetration. All meat for canning should be well trimmed.

Follow the step-by-step directions for the safe canning of meat and poultry.



## STEP 1

### SELECT APPROPRIATE EQUIPMENT

You will need several small utensils: sharp knives, large and small liquid and dry measures, towels, wooden spoons and a pie plate to hold utensils. Other useful items include a jar lifter, a saucepan for cooking meat, a wide-mouthed funnel, a wire rack and a cutting board.

Be sure to use jars that are specially designed for home canning. Coffee and salad dressing jars, for example, are not strong enough to withstand the heat and pressure of processing, nor are the lids always airtight. *Do not use cans*; reliable processing times are not available.

Two types of jars are in general use: the standard mason (a "rounded square") and the gem (round), which has a somewhat larger opening. A few narrow-mouthed mason jars are still being used, although they are no longer available.

The most common glass jar now sold uses a metal lid edged with sealing compound and a metal screw band. To ensure a perfect seal, use a new metal lid each time you pack the jar. The screw bands also tend to stretch after much use, so replace any that are getting old.

Jars with glass lids are still in use, but replacement lids are no longer made in Canada. One type has a flat glass lid and a rubber ring secured by a metal screw band; the other, called a spring-top jar, has a domed glass lid and a rubber ring secured by a wire bail that snaps over the top. To ensure a perfect seal always use a new rubber ring each time the jar is used.

Jars come in three sizes: small (American pint), holding about 500 mL; medium (American quart), holding about 1 L and large (American half gallon), holding about 2 L. Retailers don't always carry all sizes. The large jars are too big for most pressure canners and are used only for pickles and relishes.

Examine jars, lids, rubber rings and screw bands carefully and discard any that are damaged.

For processing all meat products, you must use a pressure canner with an accurate gauge or weighted pressure regulator. Be sure the rubber gasket, vent and safety valve are clean and in good

order. Replace the gasket if necessary, and have the gauge checked each year at a hardware store.

## STEP 2

### SELECT FOOD

Choose good quality meat and poultry. Less tender cuts of meat are well suited to canning because processing softens the connective tissues. Left-over meat bones can be used to make soup stock and ground meat in spaghetti sauce.

Store meat at refrigerator temperature (below 4°C) until you are ready for canning. Meat is easier to handle when it is cold. If it has to be held for more than 2 days, freeze it. Thaw frozen meat before canning.

Amount of meat to buy

Meat	Purchased weight (kg)	Approximate yield (1 L jars)
Beef, boneless	5 to 6	7
Lamb, boneless	5 to 6	7
Pork, boneless	5 to 6	7
Chicken, bone-in	5 to 6	7

## STEP 3

### PREPARE FOOD

Trim gristle and fat from meat and poultry. Cut beef, lamb and pork in 3-5 cm pieces. Cut poultry in parts; separating the thigh and drumstick. Remove bone from the breast but leave bone in other meaty parts. Remove wing tips.

Prepare soup stock according to your favorite recipe. For spaghetti sauce, use the accompanying recipe for best results.

## STEP 4

### PREPARE JARS

Processing times in this guide are based on medium-size (about 1 L) jars. Do not substitute any other size.

Examine jars carefully and discard any that are chipped or cracked. Wash jars and lids thoroughly in hot soapy water, rinse with boiling water and drain, or put them through a dishwasher.

Make sure jars are hot when packing with food; otherwise they may crack. Heat empty jars in 100°C oven\*, or half-fill them with water, place them on a rack in a kettle containing enough water to cover them halfway and heat to boiling. You can also use jars hot from the dishwasher. Place jars on wire rack, folded towel, board or newspaper to prevent cracking during filling.

Heat glass lids in boiling water. Following manufacturer's directions, prepare metal lids just before using; do not boil longer than specified. Wash rubber rings in hot soapy water and rinse.

## STEP 5

### PACK QUICKLY

Pack only as many jars as you can process at one time. Pack and close each before starting on the next. Don't fill jars right to the rim; leave a headspace of 2.5 cm. This allows for expansion of the contents during processing.

Use the hot pack method to can all meat and poultry mentioned in this guide. Hot pack means the meat is cooked before packing. After cutting the meat or poultry, place it in a saucepan and cover with water. Cover, bring to a boil, reduce heat and simmer until medium done (no pink remains).

Pack hot beef, lamb or pork loosely into hot jars, and cover with boiling cooking liquid or boiling water.

For poultry, place thighs and drumsticks with skin next to glass; breast in center of the jar and smaller pieces fitted in. Cover with boiling cooking liquid or boiling water.

Although salt is not necessary, it can be added to meats to improve flavor. Add 5 mL salt to each medium jar.

For soup stock, prepare and chill overnight. Remove fat and reheat. Pour into hot jars.

After packing, remove all air bubbles by running a knife blade around the inside and down the center of each jar. Measure headspace and add more liquid if necessary.

Carefully wipe the rim of the jar with a clean cloth. Food particles on the rim will prevent sealing.

\* 200°F



To close a screw-top jar with metal lid, remove the metal lid from the boiling water. Put it on the jar's rim and screw the metal band down firmly. Be sure the lid is centered or it won't seal.

With a screw-top jar with glass lid, place the rubber ring flat on the lid or jar. Put the lid on the jar. Screw the metal band down tightly and then loosen it (turn about 3 cm).

With a spring-top jar, place the rubber ring flat on the jar and cover with the lid. Push the long wire bail into the groove on the lid but leave the lower bail as it is until processing is completed.

## STEP 6 PROCESS CAREFULLY

Always process food immediately after closing jars, while it is still hot. All meat products must be processed in a pressure canner at 70 kPa (10 lb) pressure. Never process in a boiling water bath, oven or open kettle.

When using a pressure canner, follow instructions exactly to ensure all harmful microorganisms are destroyed. Process for the exact times given in the instructions that follow.

Never immerse the pressure gauge in water. If you have the canner manufacturer's instruction book, follow it carefully. The following procedure will help you understand the method.

- Put enough hot water in the canner to come halfway up the sides of the jars.
- Place jars 2 cm apart on the rack in the canner. Always process a full load. Use water-filled jars to fill any empty spaces.
- Adjust the lid of the canner and fasten securely. Begin heating. Leave the vent open until steam escapes with a hissing sound (this takes 5-10 minutes). Let the steam escape for another 10 minutes until it drives out all of the air; if any air remains in the canner the high temperature needed for sterilization will not be reached even though the specified pressure is maintained. Close the vent by putting the weighted pressure regulator on or by turning off the petcock.

— Continue heating. When the gauge shows the correct pressure, start to time the processing. Or, time the processing when the weighted pressure regulator starts to rock. Regulate the heat to keep pressure constant; liquid may be drawn out of jars if it fluctuates. Watch the canner closely and make certain that the pressure stays as high as required and that the exact processing time is used.

— At the end of the processing time, remove the canner from the heat and place it on a board, heavy rack or a cool burner. Let the pressure drop on its own to zero (this may take 30-60 minutes); sudden cooling drives liquid from jars. Canners that regulate pressure with a weighted regulator have a small pin safety valve in the lid. When pressure has dropped, this pin will fall level with the lid.

— When the pressure reaches zero, wait 1-2 minutes, then slowly open the vent. Let the canner cool another 2-3 minutes before removing the lid. Be careful. The canner contains live steam. Remove the lid so the steam is directed away from your face. Take out the jars and cool.

**PROCESSING AT HIGH ALTITUDES** If you have a dial-gauge canner and are canning at high altitudes (for example Banff, Calgary, Jasper and Whitehorse) you must increase the pressure by 7 kPa (1 lb) for each 610 m above sea level. Weighted pressure regulators do not adjust automatically for altitude variations. When canning meat products above 610 m use the 100 kPa (15 lb) regulator and process for the time given for 70 kPa (10 lb).

	Processing time in minutes at 70 kPa (10 lb) (1 L jars)
Meat or poultry product	
Beef, lamb, pork	90
Chicken, bone-in	75
Soup stock	45

## STEP 7 COOL SLOWLY

Place jars upright and well separated on a wire rack, folded dry cloth, board or newspapers. Avoid cold surfaces and drafts that may cause jars to crack. Do not cover them with a cloth as this slows cooling. Do not tighten bands on those with metal lids or you may break the seal, which forms as the jars cool. As soon as the bubbling in the jars stops, complete the seal on screw-top jars with glass lids by screwing down metal bands until tight (but no more, or you may stretch bands out of shape); on spring-top jars, push down lower bails until they snap into place.

Sometimes there is a considerable space in the top of a jar due to food shrinkage or liquid lost during processing. Never open a jar to fill up this space as you will expose food to spoilage organisms. Use these jars first.

Leave jars upright during cooling. Never tighten bands on screw top jars after cooling as this also may break the seal.

## STEP 8 CHECK FOR SEALS, LABEL AND STORE

When jars are cold, test those with metal lids by tapping lids gently with a spoon; if well sealed there is a clear ringing sound and the lids curve slightly inward. Test glass-top jars by inverting a minute or two; if they do not leak and bubbles do not rise in a steady stream from the lid, they are sealed. If the seal is *not* airtight, refrigerate and use the food before it spoils. Do not reprocess since the food would be extremely overcooked. You can freeze the food, but texture and appearance will change.

Wipe jars with a damp cloth, dry thoroughly and label. Store in a cool, dark, dry place. If the storage place is not dark, wrap jars in newspaper or store in cartons since light may affect the food's color.

After 1 week examine each container. Any leakage from jars indicates spoilage. Do not use this food. Flush it down the toilet so that it cannot be eaten by people or animals.

## EAT HOME-CANNED FOOD WITH CAUTION

Before opening jars of home-canned foods look for any signs of spoilage. The jar must be sealed. There must be no foaming or excessive discoloration. Cloudiness or excessive loss of liquid may indicate spoilage; if other spoilage signs are evident, destroy the food. Home-canned food will look well-cooked or slightly overcooked.

Open jars with care. First, remove screw band or release wire bail. Use a bottle opener to break the seal and the lid will easily lift off. With glass lids, gently insert a knife tip between rubber ring and lid to break the seal. Liquid that spurts or rushes out indicates spoilage.

Check jar contents. Sniff for any unnatural or off odors. The food should not be excessively soft or mushy as compared to commercially canned foods.

Botulism bacteria can grow in food without making noticeable changes. **Before even tasting home-canned meat products empty them into a saucepan, cover and bring to a boil. Reduce heat and simmer 10 minutes.**

Do not taste any food that appears to be spoiled, that foams or develops a bad odor during cooking. If you are at all suspicious of it, flush the entire contents down the toilet so people or animals can't eat it. For best quality and nutrition do not keep home-canned meat products for more than 1 year.

If you want to can spaghetti sauce the following recipe is recommended. Because canning times are different for different ingredients and amounts, for safe results do not alter the recipe.

## SPAGHETTI SAUCE

750 mL chopped onion  
4 cloves garlic, crushed  
75 mL butter or margarine  
2 kg ground beef  
4 cans (796 mL) tomatoes  
2 cans (369 mL) tomato paste  
50 mL sugar  
20 mL oregano  
15 mL salt  
10 mL crushed chili peppers  
2 mL pepper  
2 bay leaves

Sauté onion and garlic in butter or margarine until onion is transparent. Add beef and brown. Drain fat. Add remaining ingredients. Simmer uncovered 1½-2 h, stirring occasionally. Pack into hot jars. Seal and process in pressure canner at 70 kPa (10 lb) for 90 min. Makes 7 medium jars.

Prepared by Food Advisory Division


For complete information on canning fish, write to:

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