

EQUIPMENT FOR HOME CANNING

Objectives

After completing this unit you should be able to:

1. Explain how acidity, style of food, temperature of pack, size of jar, type of processing, and altitude affect processing times.
2. Describe proper canning practices.
3. Explain how to sterilize empty jars and when and why it is done.
4. Explain how lid seal and removal of air is important to obtaining good vacuum and food quality.

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Introduction

You don't need a lot of expensive utensils for home canning. In addition to every day kitchen utensils, only a few special items are necessary.

You will need canning jars with lids and rings, a deep kettle with a rack, and a pressure canner for certain foods. Canning equipment may be purchased in hardware, department, and grocery stores, as well as on the Internet.

Early in the canning season check all your equipment to make sure it is in good condition.

Canning Jars

Food may be canned in glass jars or metal containers. Metal containers can be used only once. They require special sealing equipment and are much more costly than jars.

Regular and wide-mouth Mason-type, threaded, home canning jars with self-sealing lids are specially designed and constructed to withstand the pressures and temperatures of home canning. These jars have reinforced sides and a slightly thicker rim around the mouth where the lid seals onto the jar.

They are available in 4 ounces, ½ pint (8 ounces), pint (16 ounces), 1 ½ pint (24 ounces), quart (32 ounces) and half gallon (64 ounces) sizes. The standard jar mouth opening is about 2 3/8 inches. Wide mouth jars have openings of about 3 inches, making them easier to fill and empty.

Half-gallon jars may be used for canning only very acid juices. Regular-mouth decorator jelly jars are available in 4 and 8 ounce sizes. Although 12 ounce jelly jars are manufactured there are no USDA researched directions for processing jelly in this size jar and they are not recommended.

With careful use and handling, Mason jars may be reused many times, requiring only new lids each time. When jars and lids are used properly, jar seals and vacuums are excellent.

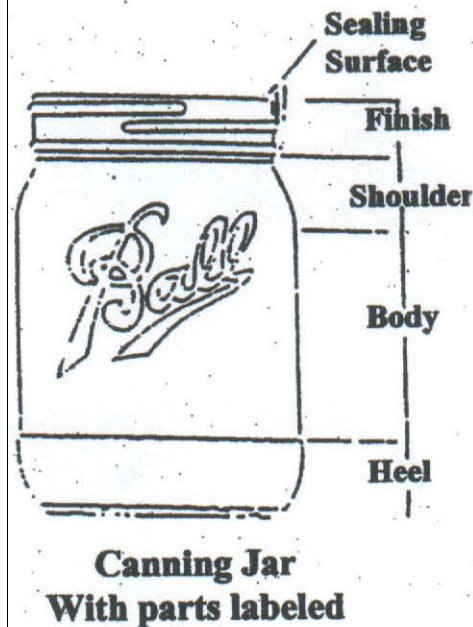
Important Note

Run your fingers around the sealing surface of the canning jar or lay it flat on the table top to see if it rocks. If there is a crack or dip in the sealing edge, return it to the manufacturer for a refund or discard the jar.

Generally, the life of a Mason jar is 10 to 15 uses.

Scale or cloudiness caused by hard water may be removed by boiling in a solution of 1 cup vinegar to 1 gallon water. If jars are etched by soft water, the discoloration cannot be removed, and the glass is weakened and should not be used for future canning.

To sterilize jars, submerge in boiling water for 10 minutes. Dishwashers do not sterilize.



Jars not recommended for home canning

a. Commercial mayonnaise and salad dressing jars (packer's jars)

All packer's jars are manufactured as one-time use jars. They are not of the quality necessary to take the abuse of home canning year after year. They have a narrower sealing surface and are tempered less than Mason jars, and may be weakened by repeated contact with metal spoons or knives. Seemingly insignificant scratches in glass may cause cracking and breakage while processing jars in a canner.

b. Commercial jars with mouths that cannot be sealed with regular two-piece canning lids

These cannot be used for canning any food at home because lids that fit them are not available for home use.

c. Bail-type jars and lids (a clear glass lid with a replaceable rubber ring between it and the jar shoulder, both held down tightly with a wire bail)

These jars are sealed using a rubber ring that fits on a sealing ledge located about $\frac{1}{4}$ " below the top of the jar.

The jars and rubber rings are no longer manufactured in the USA because there were four sealing edges and double the potential for seal failures as with the current two-piece lids. The bails would get bent and not hold the top of the jar for sealing. Old-time directions would call for "completing the

seals” after the jar was removed from the canner. This procedure could cause burns to the person, either by spillage or touching the hot jars and lids.

The antique bail-type jars are prized as collector’s items. These jars are often too brittle to withstand the heat treatment recommended today. They are best used for other than canning.

Reasons for Using Canning Jars Instead of Packer’s Jars

Packer’s jars are used in commercially prepared foods. They must meet the specifications of the packer, not the specifications of standard canning jars.

	<p>Canning jars have a deeper finish than packer’s jars, which provides for a tighter seal.</p> <p>A canning jar has been coated to make it resistant to scratches and breaks.</p> <p>All canning jars have been standardized to meet the same specifications.</p> <p>Packer’s jars have a wide range of differences in the diameter of the mouth.</p> <p>The width of the sealing surface differs in packer’s jars.</p> <p>The glass lugs on a packer’s jars are designed to be used with different type screw caps.</p>
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Reasons why jars break

- A. Thermal Shock is characterized by a crack running around the base or lower part of the jar and sometimes extending up the side. It is caused by:
- 1) setting hot jars to cool on a cold surface or near a cold draft.
 - 2) accidentally splattering hot jars with cold water.
 - 3) not using a rack in the boiling water bath or pressure canner.
 - 4) filling jars of food with water or syrup that is not boiling.
 - 5) filling jars with cold food and plunging into boiling water.

- B. Pressure Breakage is characterized by the origin of the break on the side. It is in the form of a vertical crack, which divides and forks into two fissures. It is caused by:
- 1) using the oven to process home canned foods.
 - 2) not leaving a deep enough head space to permit the expansion of the contents during heating or pressurizing.
 - 3) not keeping the heat steady under the pressure canner.
 - 4) touching the petcock before all pressure has released from the canner.
 - 5) pouring cold water over the pressure canner and not allowing the canner to cool down naturally.
- C. Impact Breakage is characterized by the origin of the break that is at the point of impact and from which fissures radiate. It is caused by:
- 1) using jars that have received trauma from rough handling in transportation or home use. The conditions such as dropping, hitting, or bumping can cause breakage.
 - 2) using a sharp metal knife to remove air bubbles.
- D. Other types of breakage are caused by:
- 3) using packer's jars instead of canning jars.
 - 4) an imperfection in the jar; it will break the first time it is used. Test empty jars by immersing them in water. Bring to a boil and boil 15 minutes.

Lids

The most reliable lids for home canning are the 2-piece metal, self-sealing type. Lids or flats, as they are also referred to, are generally made of steel, although aluminum ones were manufactured for some time. Flats are not reusable for canning because the sealing compound becomes distorted during processing, and it will not form a seal more than once.

The underside of flats is usually coated with enamel or clear lacquer to protect the metal from the acids of the food. If there are pits or scratches in this coating, black sulfate spots or rusty spots may be visible on the lid when the jar is opened. These spots are unsightly, but not dangerous; unless the pitting is so severe that a hole has formed the whole way through the lid. In that case, the seal has been broken and spoilage is possible.

Different manufacturers use different kinds of sealing compounds on their lids. Aside from being different colors (grey, white, red) these compounds also have different heating and softening properties. It is very important therefore, to follow the pretreatment directions given on the box for the particular brand of lids in use. Some brands of lids are boiled, others are simmered. More than the prescribed heat can over-soften the sealing compound, less than the necessary heat can leave it too stiff to seal properly.

Screw bands or ring bands are generally made of steel. They can be reused as long as they are in good condition. Bands that are bent out of a perfect circle shape or that are rusted should not be used. If the band is irregular and cannot apply even pressure to hold the flat in place during processing, the lid may not seal.

Lids not recommended for home canning

Zinc lids are no longer recommended because they often fail to seal. Also, the rubber rings are no longer available. Some home canners still have the old porcelain-lined zinc lids. This type of lid was used with a rubber ring that fit on a sealing edge located below the threads of the jar. The metal portion of the cap, which held the rubber ring in place, was reused many times.

Canners

Equipment for heat-processing home canned food is of two main types: boiling water bath canners and pressure canners. Most are designed to hold seven quart jars or eight to nine pint jars. Small pressure canners hold four quart jars; some large pressure canners hold 18 pint jars in two layers, but hold only seven quart jars.

Boiling water bath canners and pressure canners should not be used on a ceramic stovetop unless the manufacturer provides directions. The weight of a filled canner is too heavy and could break the stovetop. Because the canner is wider than the heating element, heat from the canner is transferred to the ceramic top, and this may cause the thermostat to shut off the heat, preventing the canner from remaining at proper temperature.

1. Boiling Water Bath Canners

A boiling water bath canner is used for processing acid foods. These include gelled products, fruits, pickles, relishes, and tomatoes.

- Boiling water canners are made of aluminum or porcelain-covered steel. They have removable perforated jar racks and fitted lids. Canners must be deep enough so that at least one inch of gently boiling water covers the jar tops during processing.
- Boiling water bath canners have either flat or ridged bottoms. A flat bottomed canner will work more efficiently on an electric range. If the bottom of the canner is not flat it will not be making contact with the electric burner. Either a flat or warped flat bottom or a ridged bottom

canner may be used on a gas burner. To ensure uniform processing of all jars with an electric range, the canner should be no more than 4 inches wider in diameter than the element on which it is heated.

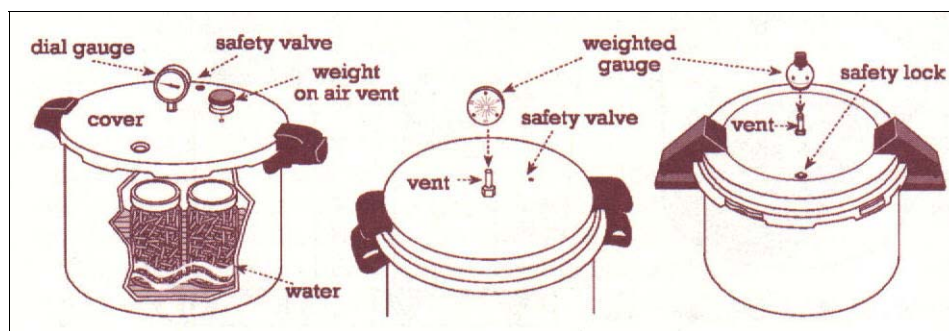
- A pressure canner may be used as a boiling water bath canner if it is deep enough to allow the one inch of water above the tops of the jars. It is used with the lid on, but not pressurized.

2. Pressure Canners

A pressure canner must be used for processing low acid foods. These include meat, fish, poultry, vegetables (not including tomatoes), and combinations of these low acid foods such as soups and stews. Temperatures higher than boiling are necessary to kill heat-resistant bacteria and spores that can survive in low acid foods.

Pressure canners for use in the home have been extensively redesigned in recent years.

- Models made before the 1970s are heavy-walled pots with clamp-on or turn-on lids. They are fitted with a dial gauge, an air-venting device (either in the form of a petcock or a pipe closed with a counterweight), and a safety fuse or valve. The lids of these canners are dome shaped, allowing a small amount of air to remain in the canner even when appropriate evacuation has taken place. These pressure canners may still be used as long as steam evacuation is done according to directions, the gauge and all other parts are working properly, and the processing pressure is held at 6 pounds, 11 pounds and 16 pounds.
- Modern pressure canners are lightweight, thin-walled pots, mostly with turn-on lids. They have a jar rack, dial or weighted gauge, automatic vent/cover lock, and a steam port (vent) that must be closed after evacuation. The weighted gauge canners are operated at 5 pounds, 10 pounds and 15 pounds pressure.



- A dial gauge is attached to the cover and has a meter for reading the internal pressure. This type of gauge must be tested for accuracy every season if used frequently.
- A weighted gauge is a small disk that sits on the vent to control the internal pressure and to allow excess steam to escape. Only the manufacturer can test this type of gauge if there are problems with it.
- Outmoded and potentially unsafe pressure canners should not be used. Compare old canners with newer models to be sure that what you have is not an old sterilizer or steamer. Before using an old canner, make sure all parts have been checked and are working properly. Buying an old second-hand canner may not be a bargain, because parts may no longer be available.
- A pressure canner may also be used as a boiling water bath canner if it is tall enough. Make sure jars can be covered with at least 1 inch of boiling water without boiling over. Set the cover in place, without fastening it, and leave the vent open to prevent the build-up of steam.

Canners not recommended for home canning

1. Steam Canners

The steam canner was designed as a means to process acid foods using steam instead of submerging the jars in boiling water. It consists of a shallow pan that is filled with about 2 quarts of water, a perforated rack on which the jars stand and a large dome cover. The manufacturer claims this process saves time and energy and uses less water. The manufacturer recommends identical processing times as those required for boiling water bath canners.

However, USDA research has found that:

- Atmospheric steam canners result in significantly lower product temperatures at the beginning and end of the scheduled process when compared to boiling water bath canning. During heating and cooling, many bacteria are killed.
- Use of steam canners as instructed by the manufacturer would result in less killing power of bacteria, under processing, and costly spoilage.

Steam in these canners is at atmospheric pressure and can only reach 212° F. at sea level. At higher elevations the temperature is lower, therefore, it is extremely dangerous to can low acid foods. The steam canner is NOT a pressure canner and cannot reach the higher temperature necessary to kill the bacteria and their spores.

2. Pressure Saucepan Canning

Small pressure saucepans are not recommended for home canning. Even though they can maintain 10 pounds of pressure, they heat up and cool down faster than larger pressure canners. Therefore, foods will be under processed and unsafe to eat.

Home canning utensils

Jar Lifters

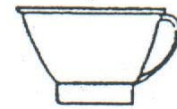
Jar lifters are an important piece of safety equipment. They are large tong-like utensils that clamp around the neck (finish) of the jar, below the lid and ring. Jars may be placed in and removed from hot canners with one hand, protecting the operator from steam and hot water burns. Some jar lifters have a protective coating on the surface that will protect the jars from being scratched.



Jar Lifter

Jar Fillers

Jar fillers are specially built funnels that fit into the opening (neck) of canning jars. The top of the funnel easily holds a ladle containing hot food. The base of some jar fillers measures typical head spaces of $\frac{1}{2}$, 1, and 1 $\frac{1}{2}$ inches. They are made of metal or plastic.



Wide Mouth Funnel

Bubble Freer

A bubble freer is a long plastic knife-like instrument that is firm yet flexible. It is used to remove air from canning jars before the lids and rings are put in place. Any non-scratching utensil that is long enough to reach the bottom of a canning jar and thin enough to go between the food pieces can be used.



Magnetic lid lifter

A magnetic lid lifter makes removing prepared lids from simmering water a quick and easy job. This tool will not scratch the coating on the inside surface of the lid, as tongs might. It consists of a magnet attached to the end of a stick, and could be made at home.



Study Questions- Equipment for Home Canning

1. Can mayonnaise or other packer's jars be used to can all types of food? Explain.
2. Why is it very important to follow the pretreatment directions given on the box of canning lids?
3. What is the reason for running your fingers around the sealing surface of the jars?
4. What is the usual life expectancy of canning jars?
5. Can you use a steam canner in the place of a pressure canner? Explain.
6. What types of gauges are available for pressure canners?
7. Why are 12 ounce jelly jars not recommended by USDA?
8. Explain how to remove scale or "cloudiness" from old canning jars.
9. Explain how to sterilize canning jars.
10. Explain why canning lids (flats) must only be used once?

Pressure Canner Gauge Test Results

Test date _____

Canning in a dial gauge pressure canner requires processing one (1) pound higher pressure than processing in a weighted pressure canner. This is necessary to ensure safety of the food being processed.

Therefore, canning directions calling for 5, 10 or 15 pounds pressure, should be translated into 6, 11, and 16 pounds pressure if you are using a dial gauge canner.

_____ This canner reads: _____

_____ This gauge is more than one (1) pound pressure off and should be replaced.

_____ When canning directions call for:

Process this canner at:

5 pounds pressure

_____ pounds pressure

10 pounds pressure

_____ pounds pressure

15 pounds pressure

_____ pounds pressure

Additional pressure (1 pound per 1000 feet) is required at altitudes over 1000 feet above sea level.