

Food Preservation

Methods of Canning

*Ivon E. McCarty, Professor Emeritus, and William C. Morris, Professor
Food Science and Technology*

Only two processing methods are recommended for canning food. These are the boiling water bath and the steam pressure canner. All other methods are unsafe and should be avoided by the home canner.

Recommended Methods

Boiling Water Bath Method:

The boiling water bath method may be used to process high-acid foods. These foods can be safely processed at 212 degrees F (100 C), the maximum obtainable temperature in a water bath canner at sea level.

Any large metal container may be used as a boiling water bath canner if it is deep enough for the water to be well over the tops of jars and there is space for the water to boil freely. The canner must have a tight-fitting cover and a metal rack with dividers to separate and hold jars off the bottom of the canner. The rack prevents jars from bumping together or tipping over during processing and permits the water to totally surround each jar.

The water in the canner should be hot, but not boiling, before loading with jars of food if the jars have been raw-packed. The water should be boiling if necessary to adjust the water level. The jars should be covered by 1 to 2 inches of water for the full processing time so the food in the top of the jar and the jar closure will be thoroughly heated. The water must boil steadily for the full time recommended for the food being canned.

The boiling water bath canner is recommended for canning fruits, tomatoes, foods with added vinegar and fermented foods. Jams, butters, marmalades, conserves and preserves are also processed in the water bath canner.

Steam Pressure Canner Method:

A steam pressure canner is used to process foods under pressure at a temperature of 240 degrees F (116 C). This is the only reliable method to safely process low-acid foods.

A steam pressure canner is a heavy kettle designed to operate safely at pressures greater than one atmosphere. It must be equipped with an accurate pressure gauge or weight to register the amount of steam inside the canner. The lid must lock or seal to prevent the escape of steam. The canner must have a safety valve and petcock or steam valve that can be opened or closed to permit exhausting (venting) air from the canner. It must also be equipped with a metal rack and dividers to separate and hold the jars off the bottom of the canner. The rack prevents jars from bumping together or tipping over during processing and permits the steam to flow uniformly over the jars.

If you are at an altitude of 1000 feet or less, 10 pounds of pressure is used for processing standard canning jars of any kind of low-acid food in a weighted gauge canner. This pressure corresponds to a temperature of 140 degrees C (116 C). If you are above 1000 feet in altitude, consult the altitude tables in *Canning Foods* (Extension PB 724). In a dial-gauge pressure canner, set the dial on 11 pounds to reach 240 F if less than 2000 feet of altitude. Maintaining a constant pressure throughout the entire recommended processing time assures the food inside the canning jars will reach the same temperature as that in the canner.

Two types of steam pressure canners are available. One has a dial pressure gauge, and the other



has a weighted gauge to control pressure. Both perform satisfactorily. The canner operator, however, is cautioned to carefully read the manufacturer's directions that accompany the canner being used. The types and brands of canners differ somewhat in details of handling.

The steam pressure canner is recommended for canning all foods in the low-acid group. This group includes all vegetables (except tomatoes), protein foods (meat, poultry, fish), mushrooms, soups and mixed vegetable recipes containing tomatoes.

Methods to Avoid

Open Kettle Method:

Open kettle canning is not a safe method of canning any food. In this method, the food is first cooked in an open kettle and then placed in canning jars and sealed without further processing.

Spoilage of foods processed by the open kettle method result from underprocessing, jars and lids that are not thoroughly sterilized or spoilage organisms entering the food while it is placed on the jar.

Oven Method:

Oven canning is not a recommended method for canning any type of food product. It is both unsafe and dangerous. It is unsafe even for acid foods, because the temperature of the food never becomes hot enough to destroy food-spoilage organisms. Since the oven is not a pressure chamber (such as a pressure canner), food inside a canning jar in the oven can be heated no higher than the boiling point of water (212 degrees F at sea level), regardless of how high the air temperature is inside the oven. This is a basic law of physics.

In addition to the danger of inadequate processing, oven canning can be dangerous. Heating foods in sealed containers causes a pressure buildup inside the container due to expansion of the food and entrapped air. If the metal band is screwed down too tight to permit the air to escape from underneath the lid, the pressure buildup will cause the food container to explode. Should the food container explode while being handled, it could result in serious injury.