

CANNING FRUITS AND VEGETABLES

Extension Service

State College of Washington

Preservation of food by canning is based upon the principle of sterilization by means of heat, and sealing in airtight containers to prevent re-infection. This method preserves food most nearly in the condition in which it would be served when freshly cooked.

The most important cause of food spoilage is the action of bacteria, yeasts and molds. These may be killed by heat. Yeasts and molds are easier to kill than bacteria and give less difficulty in canning. Many types of bacteria form spores which are very difficult to kill.

EQUIPMENT FOR HOME CANNING

Heat may be applied by the use of **water bath**, which produces a temperature 212° F. at sea level, (for altitudes above 1000 feet the length of processing should be increased 20% for each additional 1000 feet.)

Foods canned in **steamers** and **ovens** do not, under ordinary circumstances, reach a temperature higher than that in the water bath.

Water bath, steamer, or oven canning can be used successfully for processing fruits and tomatoes.

A **pressure cooker** is a vessel especially designed for obtaining temperatures higher than can be reached in the water bath. This type of equipment is recommended for the canning of non-acid vegetables, meat and fish.

Containers for canned products must be so constructed that they can be sealed air-tight to prevent the entrance of air which contains bacteria, yeasts and molds.

Glass jars employ several types of seals such as screw cap, wire clamp, and automatic seal. All are satisfactory if properly used.

Several types of glass jars require the use of rubber rings. These should be purchased new every year and should be of good quality.

Jars of the automatic seal type require a new lid each time sealed.

Tin cans are used for commercial canning and to some extent, in home canning. Tin has certain advantages over glass containers. There is no danger of breakage, tin cans are easier to handle when processing under pressure. They may be cooled quickly. Tin canning requires special equipment and may, therefore, be more expensive.

METHODS OF CANNING

Open Kettle Method:

Food is cooked in an open vessel, packed into sterilized jars and sealed immediately. This method is suitable only for fruits and tomatoes.

Cold Pack:

By this method the product is packed cold into the container, and processed in water bath or pressure canner. Only fruits which break when handled in a cooked state should be packed cold. Syrup or brine added to cold packed products should be hot.

Hot Pack:

The advantage of the open kettle method and any possible advantage of the cold pack method are combined in the hot pack. After a short boiling the hot product is packed in hot sterilized containers and processed.

STEPS IN CANNING

Canning requires careful attention to every step in the process:

1. Use only clean, fresh, solid fruits and vegetables, in prime condition. "Two hours from the garden to the can" is a good rule. Be sure that containers in which fruits and vegetables are gathered and handled are clean. Grade for size and same degree of ripeness.
2. Wash material **thoroughly**.
3. **Pre-cook** (Fruit and tomatoes may be pre-cooked or not, as desired.)
4. Pack the material in the sterilized jars or cans, working quickly.
5. Add syrup or brine. Make syrup by boiling sugar and water.
 - a. For thin syrup use one cup sugar to 3 cups water.
 - b. For medium syrup use 1 cup sugar to 2 cups water.
 - c. For thick syrup use 1 cup sugar to 1 cup water.
6.
 - a. Place rubbers in position on jars and adjust caps.
 - b. Seal tin cans which have been packed hot. (If tin cans have been packed cold, heat or exhaust in a pan of boiling water before sealing.)
7. **Process**—This means heating material to kill the bacteria.
 - a. With the water bath canner, place the jars far enough apart to allow free circulation of water, raised from the bottom of the boiler, and well covered with water.
 - b. Steam pressure process. Pour boiling water into the canner until the level is just below the rack that holds the jar, or be sure there is enough to prevent boiling dry during processing. Allow air to escape in a steady stream of steam for seven minutes before closing pet cock. Allow pressure to rise until the gauge registers desired temperature. Maintain uniform pressure during the processing period. When processing is finished, allow the pressure to go down to zero before opening pet cock. If tin cans are used, open pet cock as soon as processing is completed. Follow time tables carefully.
8. Mark or label all canned products when cold.

EXAMINATION OF CANNED FOOD BEFORE USE

All foods should be inspected before their preparation for the table. Never taste to determine spoilage. When spoilage has occurred in non-acid foods there is always the possibility that even a taste may cause serious illness. For this reason it is a good practice to boil all vegetables before use.

TIME TABLES FOR CANNING FRUITS AND VEGETABLES

(Information from Bureau of Home Economics, U.S.D.A.)

Product	FRUIT Method of Treatment before Processing	Processing Period in Boiling Water		Type of Tin Can
		Pint & quart Glass Jars	No. 2 & No. 3 Tin Cans	
		Minutes	Minutes	
Apples	Slice, quarter, or halve, then pack in containers and cover with boiling syrup.....	15	10	Plain tin
	Or boil whole in syrup or bake as for serving, and cover with syrup, and pack hot.....	5	5	Do
	Or pack hot in form of apple sauce.....	5	5	Do
Apricots	Same as peaches			
Blackberries				
Dewberries	Pack in containers. Fill with boiling hot, medium			Sanitary
Huckleberries,	syrup	20	15	enamel
Logan Berries	Or, precook and pack hot.....	5	5	Do
Raspberries				
Cherries	Pack in containers, cover with boiling syrup, using thick syrup for sour cherries, and medium for sweet	25	20	Do
	Or remove pits, add sugar as desired, bring to boil, and pack	5	5	Do
Peaches	May be packed raw, but a better pack is obtained if the fruit is first simmered 4 to 8 minutes. Do not cook until soft. Pack at once, placing the halves pit down in overlapping layers. Fill up the containers with hot syrup.....	20	15	Sanitary enamel
Pears	Pare and cook for four to eight minutes in boiling medium syrup. Pack hot in containers and fill with boiling syrup	20	20	Do
Plums	Prick, Fill in containers, Cover with boiling medium syrup.....	20	15	Sanitary enamel
	Or bring to boil, using sugar as desired. Fill hot into containers	5	5	Do
Rhubarb	Select young, tender stalks, trim, wash, and cut into half-inch lengths. Boil in a thick syrup until soft	20	15	Do
	Or add one-fourth as much sugar as rhubarb by measure and bake until tender in a covered dish. For use in pies, precook in a little water without sugar. Pack boiling hot.....	5	5	Do
Strawberries	To each quart add $\frac{3}{4}$ cup of sugar. Heat slowly while stirring until the juice collects. Boil gently for three or four minutes and let stand overnight in the kettle. In the morning reheat the mixture to boiling, fill into containers hot	5	5	Do
Tomatoes	Scald and peel. Pack whole or cut in pieces. Cover with hot tomato juice. Add 1 teaspoon salt to each quart	45	35	Do
Tomato juice	Select firm, ripe tomatoes, wash and cut into small pieces. Simmer in small quantities at a time until just soft enough to put through a fine sieve. If canning in glass, bring the juice just to boiling, pour into sterilized jars, and seal. No processing is necessary. If canning in tin, heat the juice to simmering, pour into cans, seal	5	5	Do

TIME TABLE FOR CANNING NON-ACID VEGETABLES WITH THE PRESSURE CANNER

Product	Method of Treatment before Processing	Processing period in pressure canner						Type of Tin Can
		Qt. glass jars		Pt. glass jars		No. 2 or 3 tin cans		
		Time in minutes	Pressure or temp.	Time in minutes	Pressure or temp.	Time in minutes	Pressure or temp.	
Asparagus	Tie in uniform bundles, place in saucepan with boiling water over lower tough portions. Cover tightly. Boil two or three minutes, and pack hot into containers.....	.35	10 lbs. or 240° F.	.30	10 lbs. or 240° F.	.30	10 lbs. or 240° F.	Plain tin
Beans, string	Heat to boiling with water to cover. Pack hot in containers .....	.35	Do.	.30	Do.	.30	Do.	Plain tin or C enamel
Beets, baby	Can only young, tender beets. Scald in boiling water or steam until the skins slip easily. Skin and pack hot into containers .....	.35	Do.	.30	Do.	.30	Do.	Sanitary enamel
Corn	Cut off without precooking. Add half as much boiling water as corn by weight, heat to boiling and pack hot into containers .....	.80	15 lbs. or 250° F.	.75	15 lbs. or 250° F.	.70	15 lbs. or 250° F.	C enamel
Greens, including Spinach	Steam or heat in covered vessel until completely wilted, using just enough water to prevent burning. Pack hot into container. Pack hot and not too solidly with liquid over it .....	.65	Do.	.60	Do.	.55	Do.	Plain tin
Peas, green	Use only tender young peas. Bring to boil with water to cover and pack hot into containers .....	.55	Do.	.45	Do.	.45	Do.	C enamel
Pumpkin, Squash	Cut into cubes. Add small quantity of water, bring to boil. Stir while heating through. Pack into hot containers .....	.75	15 lbs. or 250° F.	.60	15 lbs. or 250° F.	No. 2, 60	15 lbs. or 250° F.	Sanitary No. 3, 70. enamel