4-H Canning Project

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CANNING is a desirable and economical method of preserving many foods. Canning home-grown products makes it possible to have more nutritious, less expensive, and more varied meals.

A canning budget prepared at the beginning of the season will indicate quantities of different canned foods the family needs. The size of the budget depends upon the number in the family and their ages.

CONTAINERS FOR CANNING

There are many good types of jars on the market each with its own advantages. Figure 1 shows the more important of these. Numbers 1 and 2 show narrow-necked and wide-mouthed mason glass jars with a variety of lids to fit each jar. Numbers 3 and 4 are clamp top jars.

A and D show a one-piece zinc cap and screw band. This cap can be used only once.

In B and E the lid is composed of three parts. The rubber ring is placed on a glass disk which is held on with a screw band. This screw band is deeper than that used with a metal lid. The rubber ring should be used only once.

In C and F the rubber ring is placed on the jar and held in place by a one-piece zinc cap lined with porcelain.

G and H show a glass lid and a rubber jar ring. These are held in place with a wire bail fastened to the jar.

When tin cans (No. 5) are used, a special sealer is needed to close the can. Be careful to select the right lining for the kind of food. Obtain further information from the manufacturers.

Sterilization of Jars

It is not necessary to sterilize jars when the products are processed in a pressure cooker or water bath. In case the open kettle method of canning is used the jars should be sterilized before packing. For any method, however, the jars should be hot when packed. This helps to cut down on jar breakage and helps to destroy bacteria. Old porcelain-lined mason lids should be boiled for 20 minutes before using.

To sterilize jars, lids, and rubbers, bring them to the boiling point in water and boil for 20 minutes. To preheat jars, merely scald them.

SUCCESSFUL CANNING STEPS

1. **Can only fresh vegetables.**

Allow two hours from garden to can. Gather young, tender, sound products early in the morning. Gather only amount that can be canned at once. Wash vegetables in several waters, lifting them out each time, for bacteria live in the soil which sifts to the bottom of the pan.

Table 1. Quantities of Raw Fruits and Vegetables for Given Quantities of Canned Products

Fruit	Pounds (to yield 1 qt. or 1 No. 3 can)	Vegetable	Pounds (to yield 1 qt. or 1 No. 3 can)	Pounds (to yield 1¼ pt. or 1 No. 2 can)
Apples	2½	Asparagus		2
Berries	1¼-1½	Beans, shelled lima	2	
Cherries	1¼-1½	Beans, snap	1½	
Peaches	2-2½	Beets, baby, no tops	2½-3	
Pears	2-2½	Corn (ears)		4-6 ears
Plums	1½-2	Peas, green, in pods		2½-3
Tomatoes	2½-3½	Peas, shelled		1
		Pumpkin	4	

FIG. 1. Types of containers for home canning

2. **Have equipment ready.**

Test jars and covers for seal. Look for nicks in rims of jars. Secure new rubbers or new lids as needed. Use lids or covers on jars for which they were made. If using pressure cooker, see that safety valve and gauge are in order. Wash jars and equipment in soapy water and rinse.

3. **Scald all equipment.**

Scald equipment immediately before using. Steam jars, glass or metal covers, and rubbers in pressure cooker or pan of boiling water for 20 minutes. Scald self-sealing covers as used.

HOT WATER BATH PROCESS

For vegetables see table 3
For fruits and tomatoes see table 2

The hot water bath is the best method for canning tomatoes and fruit. It is not the recommended method for canning nonacid vegetables. However, for those people who use the hot water bath for canning vegetables, the following caution should be observed:

IMPORTANT—Before tasting or serving any home-canned nonacid food, BOIL 15 MINUTES. This means a full 15 minutes after the product has come to a boil. If vegetables are to be in salad, boil 15 minutes and cool.

The reason for doing this is that dangerous organisms which are sometimes present in vegetables are not killed at the temperatures used in the boiling water bath process.

Before opening jars, examine for signs of leakage or bulging rubber. When opened there should be suction. Note odor. But even if there are no apparent signs of trouble BOIL ANYWAY. The most dangerous organisms can neither be smelled nor tasted.

For the hot water bath process, select a straight-sided kettle or a container deep enough to allow jars standing on a rack to be covered 1 inch with boiling water. The cover should be close fitting. Jars may be exhausted 10 minutes and sealed.

1. Follow Successful Canning Steps.

2. Use same method as for pressure cooker in (a) precooking; (b) packing hot in hot jars.

3. Tighten lids of self-seal type, tighten screw-top and glass-top lids and turn back one-fourth inch. Leave clamp loose on lightning-type jars.

4. Have water hot in water bath, place hot jars on rack. Be sure the water is an inch or more over the top of the jars and keep it at that level. If some water evaporates, add boiling, not cold, water. **Start counting time when water begins to boil; keep a rolling boil throughout the processing time.**

5. Remove jars from water bath, seal if lids are not self-seal. Cool and store as in pressure cooker process.

Table 2. Timetable for Processing Fruits and Tomatoes in Boiling Water at 212° F.

PRODUCT	PACKING METHOD All precooked fruits should be packed hot. Temperature at center of jar should be near boiling or not less than 180° F. when processing starts. Sugar is not necessary to keep fruit from spoiling. Process unsweetened fruit the same as sweetened.	Pt. and Qt. Glass Jars	Tin Cans	
			#2	#3
		Min.	Min.	Min.
Apples*	Pare, core, cut into pieces. To keep from darkening, place in salt bath (2 tablespoons salt and 2 tablespoons vinegar to 1 gallon of water). Drain. Use one of the three following methods:			
	1. Steam or precook for 5 minutes in thin sirup or water—cover with the boiling sirup or water	20	10	10
	2. Bake or boil whole; pack in hot thin sirup	10	12	15
	3. Or make apple sauce, sweetened or unsweetened; pack hot	10	6	10
Blackberries† Blueberries Raspberries Gooseberries Currants	1. Pack raw, press gently into jars, and cover with thin or medium hot sirup made by using juice from small, imperfect berries	20	15	15
	2. Precook by boiling with sugar 3-4 minutes; stir gently. Use from ¼ to ½ cup of sugar for each quart of fruit. Pack boiling hot, add juice	5	6	10
	Exception—currants and gooseberries: pack in sirup; process 15 minutes.			
Cherries*	1. Pit, boil for 5 minutes in sugar, and pack boiling hot	10	10	10
	2. If unpitted, prick, pack in hot containers, and cover with thin or medium hot sirup, depending on the sweetness of the fruit	25	20	20
Fruit Juices Berries Cherries Currants Grapes Plums	Wash, drain, crush fruit. Add ½ cup water per 1 pound of firmer fruits (no water for soft fruits). Heat to simmering, hold 5 minutes. Strain through cloth bag. Heat juice again to simmering. Fill hot sterilized jars to ¼ inch of top. Process in water bath.	10 (pt.) 15 (qt.)	Do not recommend	
Peaches* or Apricots*	Peel and cut into halves. To keep from darkening, place in salt solution, same as apples. If fruit is juicy, add ½ cup sugar to each quart of raw fruit. Heat to boiling. For less juicy fruit, drop into thin to medium sirup, boiling hot, and just heat through. Pack hot, cover with liquid.	15	15	15
Pears*	Peel, cut into halves, core. Same as less juicy peaches.	15	15	15
Pimientos (ripe) and Sweet Peppers	Place in hot oven (450° F.) for 6 to 8 minutes, then dip into cold water. Slip off skins, remove stems and seed cores. Fold and pack into containers; add ½ teaspoon of salt to each pint. Add no liquid.	40 (pt.)	30 (#1)	
Plums	1. Wash, prick, pack into containers, and cover with hot medium sirup	20	15	15
	2. Cook with sugar to taste. Pack boiling hot	15	15	15
Rhubarb	Trim, wash, and cut into ½-inch pieces.			
	1. Add ½ cup sugar to each quart of rhubarb and let stand to draw out juice. Bring to boil. Pack hot; cover with hot juice	10	10	10
	2. Add one fourth as much sugar as rhubarb by measure and bake until tender in a covered dish. Pack hot	10	10	10
Sauerkraut	Heat to simmering but do not boil. Pack closely into containers while hot. Cover with hot juice leaving ¼-inch head space.	25 (pt.) 30 (qt.)	15	30
Strawberries*	Wash and stem. To each quart of fruit add ¾ cup of sugar. Bring slowly to boiling point; remove from stove. Let stand overnight. In the morning bring quickly to boiling and pack hot.	10	10	10
Tomatoes	Scald for 1 minute, then plunge into cold water. Drain, peel, and core.			
	1. Pack closely and fill with tomato juice; add 1 teaspoon of salt to each quart	45	45	55
	2. Cut in quarters, heat just to boiling, and pack hot	35	35	35
Tomato Juice	Use ripe but perfect tomatoes. Remove stem ends, cut into pieces. Simmer until softened. Put through a fine sieve. Add 1 teaspoon salt to each quart. Reheat at once just to boiling. Fill into hot jars or bottles at once. Leave ¼-inch head space.	30	35	45

When using tin cans:
* Use plain tin for apples, apricots, peaches, pears, pineapple, sauerkraut, and tomatoes.
† Use R enamel cans for berries, cherries, plums, pimientos, rhubarb, and grape juice.

FIG. 2. A pressure cooker is best for canning nonacid vegetables

PRESSURE COOKER PROCESS

For nonacid vegetables see table 3

1. **Precook vegetables** in boiling water to shrink products, to drive out air from tissues, and to shorten processing time. Put rubber on before packing jar.

2. **Pack hot vegetables in hot jars** and add boiling water to within ½ inch of top of jar unless stated otherwise in the directions. Add salt—½ teaspoon to pint, 1 teaspoon to quart. Do not pack tightly as that prevents thorough heating.

3. **Exhaust jars** (expel all air) by placing filled jars on rack in a pan of boiling water on the stove or in pressure cooker for 5 minutes before completely sealing. The temperature at center of jar should be near boiling (or not less than 180° F.) when processing starts. Be sure jar rims and rubbers are free of seeds, pulp, or salt. Put on covers.

4. **Seal jars completely.** For self-sealing jars, hold cover on and screw band on firmly. These jars are not completely sealed until cold. (Complete seal with tin cans; do not wet gasket.)

5. **Exhaust cooker** (expel all air). Add 1 inch of water or enough to cover rack in pressure cooker and prevent boiling dry. Put jars in cooker, clamp on the cover, tightening the clamps on opposite sides at same time. Leave petcock open until a steady stream of steam escapes (approximately 7 minutes; or 10 minutes for large cookers).

6. **Process.** Close petcock, run pressure up quickly. Start counting time when pressure reaches desired point. Use timetable. To avoid loss of liquid hold pressure constant for time required.

7. **When processing time is up** (1) remove cooker from stove, (2) allow needle on gauge to return to zero, (3) open petcock gradually; wait 3 to 5 minutes, (4) release clamps, and (5) remove cover, tilting away from the face. Wait an additional 3 to 5 minutes before removing jars.

8. **Remove jars from cooker.** Leave bands on vacuum pack jars until cold but do not tighten. Stand jars upright, place apart to cool as quickly as possible. Do not leave in draft. (Tin cans may be cooled in cold water at once.) When jars are cool, wipe clean, remove screw band of self-sealing jars, and label. Keep jars a week at room temperature. Then store in cool, dark, dry place.

Table 3. Timetable for Processing Nonacid Vegetables

Use 10 pounds pressure in pressure cooker (note exceptions) or constantly boiling water in water bath

PRODUCT	PACKING METHOD: Pack all jars boiling hot. Place jars on rack in pressure cooker or on rack in boiling water bath. Work rapidly. Temperature of the product should be near boiling or not less than 180° F. when processing starts.	PRESSURE COOKER			
		Glass jars		Tin cans	
		Pints	Quarts	#2	#3
		Min.	Min.	Min.	Min.
Asparagus*	Tie tender stalks in bundles, stand upright with tough portion in boiling water. Or cut in half-inch lengths. Boil 2 to 3 minutes. Pack hot, cover with boiling water, and add salt.	30	35	30	§
Beans Green Limas†	Shell and wash young tender Lima beans. Cover with boiling water and bring to boil. Pack hot, cover with hot water, and add salt.	45	50	40	45
Beans Snap*	Wash and cut into pieces. Cover with boiling water and simmer, uncovered, for 5 minutes. Pack hot, cover with boiling water, and add salt.	30	40	25	30
Beans* Green soybeans, shelled	Cover with boiling water; boil 3 or 4 minutes. Pack hot; cover with fresh boiling water. Add salt.	60	70	50	65
Beans Dried† kidney or navy	Soak overnight. Blanch in boiling water for 3 or 4 minutes. Drain. Fill containers leaving 1½-inch head space. Cover with boiling water, add salt and sugar, or molasses, if desired.	80	90	70	85
Beets† (Can only small young beets)	Trim off tops but leave 1 inch of stems and all of roots. Wash, scald in boiling water for 15 minutes until the skins slip easily. Skin, trim, pack into containers, add salt, and fill with boiling water.	30	35	30	30
Carrots†	Scrape, slice, dice, or leave whole. Cover with boiling water; boil 5 minutes. Pack hot; cover with hot liquid. Add salt.	30	35	30	30
Corn† Whole-grain	Cut corn from cob deeply enough to remove most of the kernels without hulls. Do not scrape cobs. To each quart of corn add 1 teaspoon of salt and 1 pint boiling water. Heat to boiling and pack. Leave 1-inch head space.	55	65	50	65
Cream style	Too hard to process. Not recommended.				
Greens, including spinach*	Pick over greens, wash carefully in several waters, lifting the greens out each time. Cover with boiling water, heat to simmering (not boiling), and cook, uncovered, for 5 minutes. Pack hot, placing loosely in jar. Cover with boiling water. Add salt.	50 at 15 lbs.	55 at 15 lbs.	45 at 15 lbs.	55 at 15 lbs.
Peas, Green*	Shell, wash, add water to cover, and simmer about 5 minutes. Pack hot, add salt, and cover with boiling water. (Peas become overcooked and mushy in quart jars or No. 3 tin cans.)	45	§	40	§
Pumpkin‖ or Squash	Wash, peel, and cut into 1-inch cubes. Add a small amount of water, and simmer until heated through, stirring occasionally. Pack hot and cover with boiling water. Add salt.	85	95	70	80

When using tin cans:
* Use plain tin. † Use C enamel cans. ‖ Use R or sanitary enamel. § Not recommended.

Sirups.—Thin: one cup sugar to three cups water; medium: one cup sugar to two cups water; thick: one cup sugar to one cup water. Heat together until sugar is dissolved and sirup is boiling. Fruit juice may be substituted for water.

CANNING MEATS

Containers—Glass jars or tin cans may be used for canning meats and poultry. The C enamel cans and R or sanitary enamel cans used for certain fruits and vegetables are not suitable for chicken or other meats as the fat may cause the enamel to peel off.

Pint or quart jars are suitable sizes for canning meats.

Head space—In canning meats, the head space is important. The meat should be covered with liquid to prevent discoloration and loss of flavor during storage. In packing containers, allow the following head space: glass jars, 1 inch; No. 1 and 2 tin cans, ¼ inch.

Processing time—Minnesota Agricultural Extension Folder 114, "Canning Meats at Home," is being revised. A new how-to-do-it leaflet, "Home Canning of Meat," AWI-110, has just been issued by the U. S. Department of Agriculture. The new timetables in these publications are recommended for 4-H members to follow.

INGREDIENTS USED IN CANNING

Either cane or beet sugar may be used for canning as there is neither chemical difference nor difference in size of crystals. Coarse grained as well as fine grained sugar may be obtained in either type of sugar. To season non-acid products with sugar, add it when reheating to serve.

Salt may or may not be added to vegetables and meat before they are processed. Salt does not act as a preservative but is added for flavor.

FROSTED FRUITS, VEGETABLES, AND MEATS

Members doing any work with frosted fruits or vegetables may count this as an extra method of preservation. Dried products should also be listed. Report products—frozen, dried, or stored fresh—in pounds rather than by quarts, bushels, or fractions thereof.

JELLIES

A fruit jelly is a semisolid mass which holds its shape when turned out onto a plate but quivers when the plate is moved. It should have the color and delicate flavor characteristic of the fruit from which it is made. Usually it is translucent. Jelly should cut easily, yet break with a sharp cleavage line and show clean-cut faces.

Essential substances for jelly making are: fruit containing jelly, fruit containing acid, and sugar.

Pectin is the jelly substance found in fruits in various quantities. Unripe fruit contains more pectin than ripe fruit; thus overripe fruits do not jell satisfactorily.

A pectin test will help to determine the proportion of sugar that is needed for the different juices. To test for pectin, place one teaspoon of cooked, cooled juice into a shallow dish with one teaspoon of alcohol (grain, wood, or denatured) and mix gently.

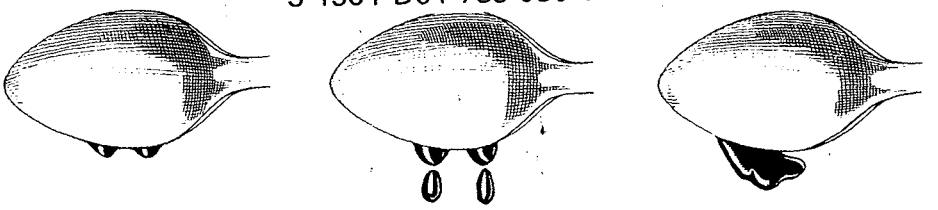
In excellent jellying juice the juice becomes solid almost at once, with little or no liquid left. Use 1 cup sugar to 1 cup juice.

In good jellying juice the juice forms quickly into 2 or 3 masses. Use ¾ cup sugar to 1 cup juice.

In fair to poor jellying juice a few lumps of jelly form and there may be considerable liquid. Use ½ cup sugar to 1 cup juice.

Some people prefer to use a jelmeter in making the pectin test.

"The jelmeter is a graduated glass tube with a given opening devised to measure the relative viscosity of a fruit juice. The rate of flow of the juice through the tube is considered a rough measure of the jellying power of the



Jelly drops first are light and sirupy

Then they become heavier and show signs of sheeting

When jellying point is reached, the jelly breaks from spoon in a sheet or flake

juice and an index of the quantity of sugar to be used with that juice."—U.S.D.A. Farmers' Bulletin 1800.

Steps in Making Jelly

1. Use slightly underripe fruit, clean and free from decay. Wash, trim, and cut into small pieces without discarding peelings, cores, or seeds.
2. For soft juicy fruits add 1 part water to 4 parts fruit. For fruits that have tough skins and for berries add 1 part of water to 2 parts fruit. For hard fruits add just enough water to cover fruit.
3. Cook fairly rapidly until fruit is quite soft.
4. Pour into bag (flannel is best) and drain without squeezing bag. It should be fairly well drained within 30 minutes.
5. If an excellent or good pectin test is obtained, return pulp to kettle, cover with water and repeat the boiling and draining process. Repeat as long as pectin test is obtained.
6. Measure juice to determine sugar needed, based on pectin test.
7. Put glasses and covers into a pan and cover with cold water. Let them come to a boil and boil 20 minutes.
8. Boil small quantities of juice (not more than 6 cups) at a time in order that a fine tender jelly may be obtained. Bring juice to a rolling boil and add heated sugar gradually, boiling until jelly test is given.
9. To test, dip a spoon into the boiling juice, then raise it above the liquid, and let juice run off from side of spoon. When jelly is done, it breaks off in sheets. When this point is reached, take from fire instantly. Another test is to boil it until a little will "jell" on a cold plate.
10. At the end of the cooking process, just before pouring it into glasses, skim off scum which rises to top. Pour hot jelly into hot glasses.
11. When jelly is cool, cover with a thin layer of hot paraffin. Cover and label neatly. Store in dry, cool place.

JAMS AND MARMALADES

Jams and marmalades are much like jelly except that jams are made from whole fruits and marmalades usually from pulp and juice.

From three-fourths to one cup of sugar to each cup of juice is used. Use only three-fourths cup of sugar for one cup of peaches, plums, currants, and raspberries, and one cup of sugar to each cup of strawberries and cherries. Many fine marmalades are made by combining fruits of different flavors such as rhubarb and oranges or apricots and pineapple.

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