

CANNING FRUITS AND VEGETABLES



NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
AND
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INTRODUCTION

The bulletin on CANNING FRUITS AND VEGETABLES was originally intended for the use of the North Carolina Home Demonstration Club members, but the demand from those outside the clubs for the methods and recipes has been so great that a seventh edition is necessary. To all regulations and standards given the club members are expected to conform.

The purpose is to establish a uniform standard for canned products throughout the State.

Perhaps it would not be amiss to say here that there is not one unnecessary step taken in grading, packing, and processing fruits and vegetables to insure safe-keeping, and I would strongly advise any person canning for home use to adhere strictly to the standards here given, that the percentage of spoils may be reduced to a minimum.

Mrs. Cornelia C. Morris has rendered valuable assistance in the revision of CANNING FRUITS AND VEGETABLES and is due credit for the preparation of the directions on canning meats.

JANE S. MCKIMMON.

*Assistant Director of Extension,
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CANNING FRUITS AND VEGETABLES

SEVENTH EDITION

JANE S. MCKIMMON

State Agent in Home Demonstration Work

CANNING SUPPLIES

It is the part of wisdom when deciding to can in tin or glass to order supplies early and to be in readiness when the fruit or vegetables ripen.

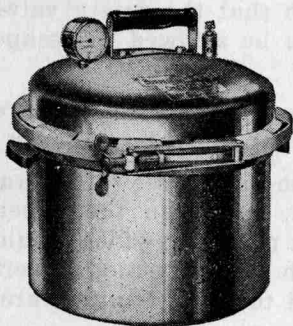
Cans.—In ordering tin cans the best are none too good. Always stipulate that they shall be twice dipped, as leaks may occur with the cheaper ones.

Sanitary Cans.—This can has an opening as large as the top of the can and is very easily packed. It is almost universally used.

The No. 3 can is popular for tomatoes, peaches, etc., and holds a quart. No. 2 is the next size smaller, and is used generally for peas, corn, soup mixture, etc. No. 1 is the size used for pimientos. No. 10 is the so-called gallon, but holds slightly less.

TYPES OF CANNERS

The Hot-Water Canner.—There are many excellent types of hot-water canners. They should have closely-fitting tops, as steam plays an important part in the sterilization of cans.



A type of cast-iron steam-pressure Canner. Will carry 30 pounds of pressure.

Hot-Water Canner.—Several convenient types of portable canners are on the market. The simplest hot-water outfit is one to be placed on the kitchen stove. Another, more complete, has a fire-box attached and is used out-of-doors. These outfits also include blanching trays, tongs for handling hot jars, and a false bottom.

The type of canner should be chosen with reference to the kind and amount of canning to be done. The small hot-water canner is the least expensive of the commercial outfits for home canning. For inexperienced people it is also more easily handled. This type of canner is preferable for processing fruits and tomatoes.

They are canned safely at boiling temperature, and the texture, flavor, and color of the finished products so processed at this temperature are superior to those which have been subjected to the higher temperatures.

Steam-Pressure Canner.—The steam-pressure canner is constructed of strong material and is provided with a tightly-fitting lid, which when clamped in place makes it possible to hold steam under pressure and obtain a correspondingly high temperature. It has a steam gauge attached to the lid. This attachment registers the temperature and the corresponding number of pounds pressure. Since the steam canner is made of very heavy material, a greater degree of heat is required to bring up the temperature quickly.

The steam-pressure canner is recommended for all non-acid vegetables, meats, and sea foods.

DIRECTIONS FOR USING PRESSURE CANNER

Pour boiling water into the canner until the level is just below the rack that holds the jars. Be sure that there is enough to prevent boiling dry during processing.

When the canner has been filled, adjust the cover and fasten securely. In case the cover is fastened by several clamps, fasten moderately tight those opposite each other, one pair at a time; then go back over the whole set and tighten each pair.

See that no steam escapes anywhere except at the pet-cock.

Allow the pet-cock to remain open until steam escapes from it in a steady stream for at least 3 minutes, indicating that no air remains inside, then close the pet-cock.

Allow the pressure to rise until the gauge registers the pressure that indicates the desired temperature.

Count time from the moment the desired temperature and pressure are reached.

Maintain a uniform pressure during the processing period by regulating carefully the source of heat. Fluctuations in pressure, as from 10 pounds to 15 pounds and down again, are to be avoided in any case, and when canning in glass may result in loss of liquid. A sudden drop in pressure through cooling or release of steam may also cause this. It is especially important to avoid having the pressure go so high that the safety valve releases the steam suddenly, nor should the steam be allowed to escape suddenly by opening the pet-cock.

At the end of the processing period remove the canner from the fire and proceed according to the following directions adapted to jars or cans:

When canning in glass jars, allow the canner to cool until the steam gauge registers zero before opening the pet-cock, and even then open cautiously. This is to prevent too sudden a drop in pressure, which would cause the liquid to blow out of the jars, even though already sealed. Invert the jars, allow them to cool as quickly as possible to room temperature, and do not stack them while they are still hot.

When canning in tin, open the pet-cock wide at once and allow the steam to escape rapidly. Remove the cans from the canner and plunge them into cold running water if possible, or, if this is not available, change the water as soon as it becomes warm. The more rapidly the cans are cooled the less danger there is of overcooking the product. Watch carefully for air bubbles that indicate imperfect sealing.

CHECKING UP RESULTS

Mark all canned products so that those in each batch can be distinguished. Examine the inverted glass jars for signs of leakage. Hold canned products at room temperature for a week or ten days, where they can be examined at least once a day to be sure that they are keeping. If the contents of any jars or cans show signs of spoilage, examine all of that lot carefully. After this observation period, store the canned goods in a cool place. A short storage at rather high temperature serves to bring out quickly defects that might not be noticed if the products were stored at a lower temperature. Results can thus be checked up and methods improved.

STEPS TO BE TAKEN WHEN CANNING IN TIN

Definitions of Terms Used

1. **Sterilizing.**—Wash and sterilize all cans which are to be used. Place them in a canner where water is boiling. Let them remain ten minutes. Remove and invert on clean surface until used.

2. **Sorting and Grading Fruit.**—Select only fresh, sound, thoroughly ripe fruit and vegetables, and grade as to size and color. Thoroughly clean or peel.

X 3. **Blanching.**—Where the recipe calls for blanching, never omit. This is necessary with string beans, peas, lima beans, etc., and with most fruits and berries. The flavor of the vegetable is made more delicate, the vegetable itself more pliable, and a full pack is made easier. To blanch, place vegetables or fruit in the wire basket of canner or in a thin muslin sack and plunge into boiling water. (Time of blanching is given in the timetable.)

4. **Packing.**—After fruit or vegetables are blanched, pack them in sterilized cans until the can is filled to about one-quarter inch of the top. Begin to pack firmly with spoon or paddle when the first bit of fruit or vegetable is put into a can, pressing down gently until the can is filled. Add hot brine or syrup as packing proceeds. Tomatoes must have no water added. There will be sufficient juice to fill crevices. Be sure every filled can is up to standard weight. This is shown by placing can on the scales and consulting table.

5. **Paddling.**—In packing canned or preserved products in glass it is necessary to use a thin, flexible wood or reed blade. This is used to help place fruit in the jar and also to remove air bubbles. The paddle is also quite useful in packing tin cans.

6. **Exhausting.**—Solder-sealed cans, if packed cold, should be exhausted in boiling water from three to five minutes.

If directions call for precooking of products and they are packed while hot, exhausting is not necessary.

X 7. **Processing.**—After the can has been sealed, it is ready for the processing. Processing is sterilizing by cooking continuously for a given length of time. Plunge the cans under water to be sure there are no leaks. (A bucket of warm water may be used for this purpose.) Place cans for processing in trays and lower into the boiling water. The temperature of

the water will then be reduced. Wait until boiling begins again before processing time is counted. Keep the water boiling every minute of the time during processing and remove cans promptly when time is up. Consult time-table and have a clock or watch at hand. Do not guess.



Standard Packs in Tin

If steam-pressure canner is used, follow directions for steam-pressure canning.

8. **Cooling.**—Tin cans should be cooled as quickly as possible after processing. Place them in tubs of cold water, and when they are taken out separate in order that the air may keep them cool. Never stack cans while warm, and never leave them in the sunshine. The flavor of the fruit is injured and the fiber or flesh breaks down if the can is left too long in a heated state. Always store canned products in a cool place. Never allow the can to rust by keeping it in a damp cellar. Its appearance will injure the chance of marketing, and rust may eat holes in the tin.

9. **Labeling.**—Do not label a can until ready to sell. A fresh label will be a great asset. Use paste recipe given below, and put paste on one end only of the label. Pull the label tightly around can, making a neat and trim job. The 4-H label may be used by club members only, and then only when products are standard. The label must bear the name and address of member and net weight in ounces of contents of can.

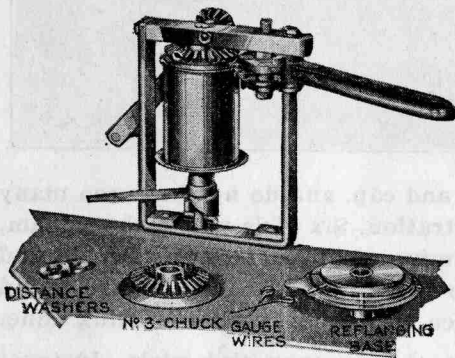
10. **Paste.**—To 1 cut of flour add 1 cup of cold water, and mix thoroughly. Add $2\frac{1}{2}$ to 3 cups of boiling water, stirring to prevent lumps. Place on stove and bring slowly to boiling point; boil 5 minutes. Stir to prevent burning. When cooked, add 1 teaspoonful of powdered alum and half a teaspoonful of oil of cloves. Pour into small glasses with covers. This will keep, and makes an excellent paste to use in labeling cans or jars.

SOME THINGS TO BE OBSERVED WHEN CANNING

1. If hot-water canner is used, be sure the canner is partly filled with water before fire is built.
2. Keep the water at a jumping boil and do not allow fire to die down for an instant while cans are in the canner.
3. Keep cover on canner every moment of the processing time. Steam plays a large part in cooking the contents of a can.
4. If possible, use two canners, one for blanching fruit and the other for canning. A large pot set over a fire will serve for blanching.
5. The quality or grade of the pack depends on the number of whole fruits or uniform pieces of fruit in the can, the color of the fruit, the weight, and the flavor.
6. The flavor is often injured by letting peeled fruit stand too long before cooking. Prepare at any one time as many cans only as can be processed immediately.
7. Let "Straight from Vine to Can" be the motto. Never can stale fruit.
8. Mark every can as it is filled with the name of its contents. A pencil may be used, as the writing will not boil off. This prevents confusion when labeling.

Use No Artificial Preservatives.—Artificial preservatives in the form of "Acids," "Preserving Powders," and "Formulas" of various kinds are used in some localities in the preservation of foods. They are recommended by advertisements and agents as being perfectly harmless and are guaranteed to keep fruits and vegetables indefinitely. The object in using preservatives of any kind is to kill bacteria, thereby preventing fermentation and decay, and a preservative strong enough to do this may also be strong enough to cause digestive troubles when taken into the stomach.

The cheapest, surest, and only absolutely safe way is to sterilize by means of heat. The small amount of sugar and salt used in canning fruits and vegetables does not act as a preservative. It is added for flavor.

LIST OF ARTICLES REQUIRED FOR A CANNING DEMONSTRATION

A Hand-Sealer
To be used with the Sanitary Can

Canning Outfit:

Hand sealer.
Plenty of water.
Shelter in case of rain.
Tin cans.
Clean cloths.

Three tables, well scoured or covered with oil cloth.

Salt and sugar.

Three teaspoons.

Three tablespoons.

Glass jars with tops and rubbers

Dish towels.

Lead pencil.

Watch or clock.

Household scales.

Three paring knives.

Four granite-ware pans.

Three tubs.

Bucket and dipper.

Bag for blanching.

Wash basin.

Soap.

Hand towels.

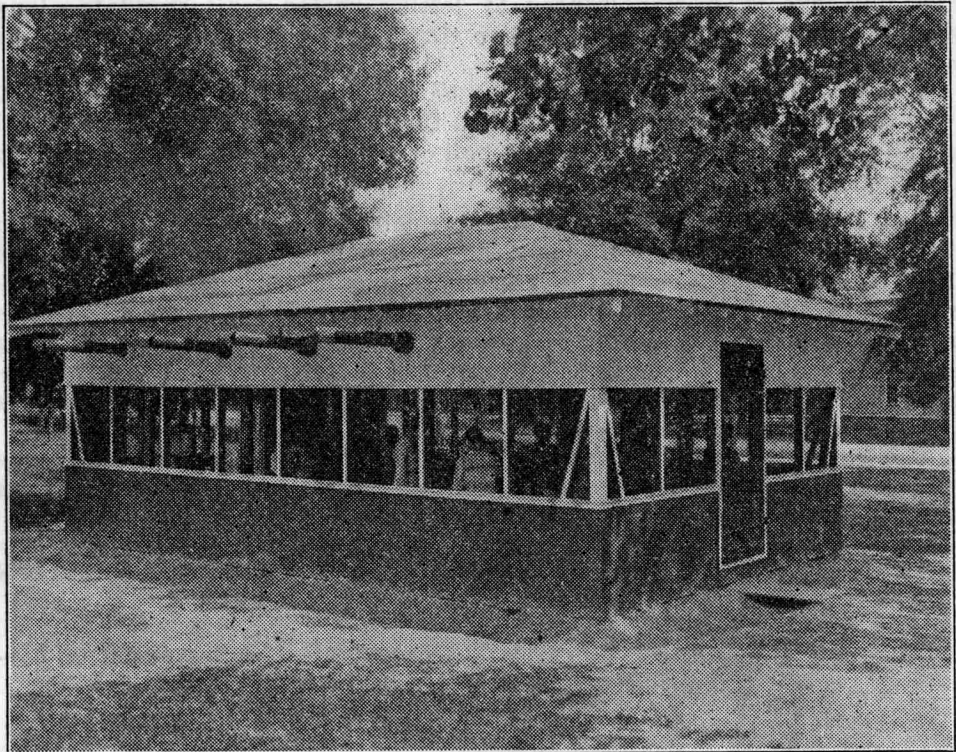
Labels.

Paste.

INSTRUCTIONS TO AGENTS FOR PUBLIC CANNING DEMONSTRATIONS

There will be many calls for public demonstrations in canning. These are to be encouraged, as it is desirable that the public be taught to can; but care should be taken that both club members and county agents are experienced before attempting these demonstrations.

Have everything ready before the audience arrives; the canner filled with water first, and next a good fire to keep the water boiling. Detail one girl to look after this. Two canners are best, if possible, that there may be one for blanching fruit and the other for processing.



See that every girl has a white apron and cap, and do not have too many working at one time at a public demonstration. Six girls will make a team, one to attend to the fire, cooking, and timing of products; two to scald and peel; two to pack and weigh; and one to seal and label. Let the girls stand on one side of the table, that the audience may observe what is being done.

Be sure to impress the proper weight of cans upon club girls. Instruct them as to what is required before products can be put upon the market. Continually preach only **red, ripe tomatoes and firm, thoroughly ripe fruits and berries** for canning. The idea is prevalent that unripe fruit is good enough for canning if it is well cooked. Unripe fruit is poorly flavored and will lower the grade of the finished product.

Let no girl use the club label whose products are not up to standard.

The following standards are sent out by the United States Department of Agriculture:

STANDARDS FOR 4-H BRAND CANNED VEGETABLES

Tomatoes.—Cans to contain not less than 2 pounds 1 ounce tomatoes in No. 3 and not less than 1 pound 4 ounces tomatoes in No. 2. To be filled with sound, ripe fruit, carefully peeled and cored; tomatoes to be whole or in large pieces, firm, uniformly red, and of good flavor.

String Beans.—Net weight in No. 3 can before liquor is added at least 1 pound 8 ounces, brine 8 to 10 ounces. Net weight No. 2, 13 ounces beans and about 8 ounces liquor. Beans to be tender, green, uniform in size, well strung, and of good flavor. The net weight which appears on label should be, for No. 3, 2 pounds, for No. 2, 1 pound 5 ounces.

Peas.—No. 2 cans to have at least 13½ ounces net weight of peas and about 8½ ounces liquor; peas to be fairly uniform in size, tender, whole, and of good flavor; liquor clear. Net weight appearing on label should be for No. 2 cans 1 pound 8 ounces.

Baby Beets.—To be packed in No. 2 lacquered tins, about 30 baby beets to each can, maximum size 1½ inches in diameter and average size 1 inch in diameter. No. 2 can to have at least 16 ounces whole beets and 4 ounces liquid. Net weight which appears on label should be for No. 2 can 1 pound 4 ounces.

Okra.—Net weight of contents in No. 3 can should appear on label, 2 pounds. Only young, tender okra should be packed, and it is best to remove the cap without cutting into the seed pod, and pack whole. Brine is added as explained in the table.

Peppers.—No. 2 cans to contain between 8 and 10 whole peppers. Flat No. 1 cans to contain 4 or 5 whole peppers, and net weight of contents appearing on the label should be for No. 2 can not less than 1 pound, or flat No. 1 can not less than 8 ounces.

Soup Mixture.—No. 3 cans contain 34 ounces. Net contents.

STANDARDS FOR 4-H BRAND CANNED FRUITS

Figs.—Net weight contents No. 2 enamel-lined can of figs should appear on label not less than 1 pound 6 ounces. Figs should remain whole, and a No. 2 can contain about 30 whole figs.

Peaches.—No. 3 can to have at least 1 pound 5 ounces solids and 11 ounces liquid; to contain between 10 and 12 halves of peaches, and have net weight of contents appearing on label not less than 2 pounds.

Pears.—Net weight in No. 3 can should be not less than 2 pounds, having 11 ounces liquid, 1 pound 5 ounces solids, and between 12 and 14 halves.

Berries.—No. 3 can, blackberries or raspberries, net weight 2 pounds; No. 2 cans, net weight 1 pound 6 ounces, whole berries weighing about one-half of total in each case. Berries to be large, whole, of good color and flavor.

Almost all No. 3 cans, no matter what they contain, weigh 38 ounces gross.

To make syrups recommended, boil sugar and water together in proportions given below:

Syrup No. 1, use 14 ounces to 1 gallon water.

Syrup No. 2, use 1 pound 14 ounces to 1 gallon water.

Syrup No. 3, use 3 pounds 9 ounces to 1 gallon water.

Syrup No. 4, use 5 pounds 8 ounces to 1 gallon water.

Syrup No. 5, use 6 pounds 13 ounces to 1 gallon water.

One pint sugar is one pound.

Number of cans per bushel yielded by the following vegetables:

1 bushel of tomatoes yields 24 No. 2 cans.

1 bushel of tomatoes yields 18 No. 3 cans.

1 bushel of beans yields 20 No. 2 cans.

1 bushel of beans yields 14 No. 3 cans.

1 bushel of peas in hull yields 25 No. 2 cans.

100 ears of corn yields 30 No. 2 cans.

SCORE FOR JUDGING THE QUALITY OF CANNED FRUITS AND VEGETABLES

	Score of 100
I. Appearance	25
(a) Color.	
(b) Clearness.	
II. Texture	10
III. Flavor	20
IV. Uniformity	15
(a) Ripeness.	
(b) Appropriate size.	
V. Pack (arrangement and weight)	15
VI. Container	15
(a) Appropriate package.	
(b) Label.	
(c) Neatness.	

PREPARATION OF MEAT FOR CANNING

1. Select fresh, clean meat. Discard the surplus fat.
2. Season and cook as for serving, but do not cook until done.
3. Cooking the meat before canning brings out the flavor and shrinks it, thus more can be put into the can.
4. Season lightly and do not over-cook. In frying use a minimum of flour.
5. Cut meat into pieces suitable for serving. Remove bones (except in fish and fried chicken). If bones are not removed the processing time must be increased.
6. Pack meat tightly to within three-fourths inch of the top of the jar.
7. Canned meats are more attractive if no liquid is added to the pack.
8. Meats should be hot when packed. If glass jars are used the tops should be wiped off carefully to remove all fat before the rubbers are adjusted, as fat causes the rubber to disintegrate.
9. Pressure cookers only should be used in canning meats. Other methods are unsafe.
10. After processing inspect cans and jars to be sure of a good seal.

Time-Table for Canning Meats With the Pressure Cooker

	<i>Treatment Before Processing</i>	<i>Process No. 3 Cans and Quart Jars</i>	<i>No. Pounds Pressure</i>	<i>Process No. 2 Cans and Pint Jars</i>	<i>No. Pounds Pressure</i>
PORK ROASTS: BEEF MUTTON	Sear, season and cook until partly done. Slice and pack hot.	45 minutes	15	40 minutes	15
STEAK	Sear in hot pan, but do not cook done. Add seasoning. Pack hot.	45 minutes	15	40 minutes	15
STEWES	Cook as for serving and pack hot.	45 minutes	15	40 minutes	15
GROUND MEAT MIXTURE	Prepare as for serving. Do not pack jars too full.	45 minutes	15	40 minutes	15
FISH	Soak in salt water 20 minutes. Cook with seasoning and pack hot.	75 minutes	15	75 minutes	15
CHICKEN WITHOUT BONES	Boil or bake, cut into small pieces, remove bones and pack hot.	45 minutes	15	40 minutes	15
CHICKEN WITH BONES	Bake or fry. Pack hot.	90 minutes	15	90 minutes	15

Time-Table for Canning Fruits and Certain Vegetables in Tin and Glass in the Hot-Water Canner
Read Recipes Before Proceeding

	<i>Treatment Before Processing</i>	<i>Liquor</i>	<i>Number of Can</i>	<i>Process</i>	<i>Glass Jar</i>	<i>Process</i>
APPLES	Precook 5 minutes in syrup.	No. 2 syrup	3	8 minutes	Quart	15 minutes
BEANS (very young string)	Blanch 3 to 5 minutes.	Brine	3	1 hour	Quart	1 hour 15 minutes
BEEFS, BABY	Cook $\frac{3}{4}$ done.	Hot water	3	1 hour 30 minutes	Quart	1 hour 40 minutes
BLACKBERRIES	Blanch 1 minute.	No. 2 syrup	3	8 minutes	Quart	13 minutes
CHERRIES	Pack in jars or lacquered tin cans. Cover with syrup.	No. 3 syrup	3	20 minutes	Quart	30 minutes
DEWBERRIES	Same as blackberries.					
FIGS	Peel and cook in syrup until saturated.	No. 3 syrup	2	25 minutes	Quart	
HUCKLEBERRIES	Same as blackberries.					
LOGANBERRIES	Same as blackberries.					
PEACHES	Cook in syrup 1 minute.	No. 3 syrup	3	20 minutes	Quart	25 minutes
PEARS	Cook in syrup until tender.	No. 3 syrup	3	20 minutes	Quart	25 minutes
PLUMS	Prick, pack in jar or lacquered cans and cover with syrup.	No. 3 syrup	3	15 minutes	Quart	20 minutes
PIMIENTAS	Heat in oven until blistered. Peel.	No water	1	15 minutes	Pint	30 minutes
RASPBERRIES	Same as blackberries.					
SAUERKRAUT	Pack in jars.	Brine	3	35 minutes	Quart	40 minutes
SOUP MIXTURE	Cook until thick.					
	Boil until $\frac{3}{4}$ done. Peel and pack hot.	Two tablespoonfuls water	2	1 hour	Quart	1 hour 30 minutes
SWEET POTATOES		Salt, sugar. No water.	3	3 hours	Quart	3 hours
TOMATOES	Blanch 1 minute.		3	22 minutes	Quart	25 minutes

If solder-sealed tin cans are used, products should be exhausted 3 minutes before processing.

Time-Table for Processing Non-Acid Vegetables With the Pressure Cooker

	Treatment Before Processing	Liquor	Number of Can	Process	Temp. Degrees F.	No. Lbs. Pressure	Glass Jar	Process	Temp. Degrees F.	No. Lbs. Pressure
ASPARAGUS	Precook 4 to 5 minutes.	Brine	3	30 min.	240	10	Quart	40 min.	240	10
BABY BEETS	Cook until skins will slip off.	Hot water	3	30 min.	240	10	Quart	40 min.	240	10
BEANS, LIMA	Blanch 2 to 4 minutes.	Brine	2	50 min.	240	10	Pint	55 min.	240	10
BEANS, STRING	Blanch 3 to 5 minutes.	Brine	3	30 min.	240	10	Quart	40 min.	240	10
CORN	Blanch on cob 2 minutes. Cut from cob, cover with hot water and boil 10 minutes.	Water, salt, and sugar	2	80 min.	250	15	Pint	90 min.	250	15
FIELD PEAS	Precook 10 minutes. Pack hot. Add 1 teaspoon salt. Cover with hot water.		2	50 min.	240	10	Pint	55 min.	240	10
GARDEN PEAS	Blanch 1 to 4 minutes.	Water, salt, and sugar	2	45 min.	240	10	Pint	50 min.	240	10
OKRA	Blanch 3 minutes.	Brine	3	40 min.	240	10	Quart	45 min.	240	10
PUMPKIN	See recipe for squash.									
SQUASH	Cook until tender. Pack hot. Add 1 teaspoon salt to each jar.		3	85 min.	240	10	Quart	90 min.	240	10
SOUP MIXTURE	Cook until thick. Pack hot.		3	30 min.	240	10	Quart	30 min.	240	10
SPINACH	Wash and steam in covered vessel until wilted. Pack hot. Cover with liquor from steaming. Add teaspoon salt.		3	75 min.	240	10	Quart	80 min.	240	10
SWEET POTATOES	Boil until $\frac{3}{4}$ done. Peel and pack hot.	Two table- spoons water	3	70 min.	250	15	Quart	75 min.	250	15

**Time-Table for Intermittent Processing of Non-Acid Vegetables in the Hot-Water Canner
If Pressure Cooker Is Not Available**

These vegetables must be processed the same length of time on each of three successive days.

	<i>Blanch</i>	<i>Liquor</i>	<i>Number of Can</i>	<i>Process</i>	<i>Glass Jars</i>	<i>Process</i>
ASPARAGUS	3 to 4 minutes	Heavy brine	3	1 hr. 15 min.	Quart	1 hr. 20 min.
BEANS, LIMA	2 to 4 minutes	Brine	2	1 hr. 10 min.	Pint	1 hr. 25 min.
BEANS, STRING (well-grown)	3 to 5 minutes	Brine	3	1 hr. 15 min.	Quart	1 hr. 30 min.
CORN	Precook 10 minutes	Water, salt, and sugar	2	1 hr. 15 min.	Pint	1 hr. 30 min.
FIELD PEAS	Precook 10 minutes	Water and salt	2	1 hr. 15 min.	Pint	1 hr. 30 min.
GARDEN PEAS	1 to 5 minutes	Water, salt, and sugar	2	1 hr. 15 min.	Pint	1 hr. 30 min.
OKRA	3 minutes	Brine	3	1 hr. 10 min.	Quart	1 hr. 15 min.
SQUASH	Precook 10 minutes	Salt	3	1 hr. 30 min.	Quart	1 hr. 40 min.
PUMPKIN	Precook 10 minutes	Salt	3	1 hr. 30 min.	Quart	1 hr. 40 min.
SPINACH	Steam 4 minutes	Salt	3	1 hr. 15 min.	Quart	1 hr. 30 min.

Corn, lima beans, and peas should never be packed in larger container than No. 2 can. Corn is cut from cob after blanching.

The brine used is made of 2½ ounces salt to 1 gallon of water, except for asparagus, which contains 4 ounces to 1 gallon.

Beets and rhubarb when packed in tin must be put in enamel-lined cans.

CANNING IN GLASS

Glass jars are more economical for home canning than are tin cans, as they can be used over and over again and the cost be spread over several years.

The Kind of Jar.—Select, if possible, a good jar of clear white glass. Fruit or vegetables show to great advantage through crystal-clear glass.

The square or round jar is used as an exhibit jar.

If clear glass cannot be had, green glass may be used, but the appearance of the canned product is much injured.

Sterilization, however, can be effected as well in one as in the other, and the green jars serve excellently well for home use.

A good spring top or a metal top, with which a hand-sealer is used, is preferable, though the Mason top will serve for one year. After that time it is advisable to fit old Mason jars with new tops.

Rubbers.—After the contents of a jar have been sterilized it is necessary that the jar be kept air-tight in order that whatever is enclosed may remain free from the action of bacteria. This may be done with rubber rings. Do not use rubbers the second time. The first season's heating destroys the life or elasticity of the rubber. For this reason it is important that good new rubbers be used. In buying rubbers, as in buying jars, get a good grade. Test the rubber for elasticity by stretching and folding. If it shows signs of cracking it is a poor product.

To Sterilize Jars.—To sterilize glass jars, place them in the canner in tepid water. Do not fill the canner with more than three inches of water. Place cover on the canner. Bring the water to a boil and steam jars 8 minutes.

No glass jars should be placed in a canner that does not have an extra bottom or basket to keep them from touching the true bottom of the canner. If this happens jars will break. A piece of half-inch mesh galvanized wire netting will answer the purpose.

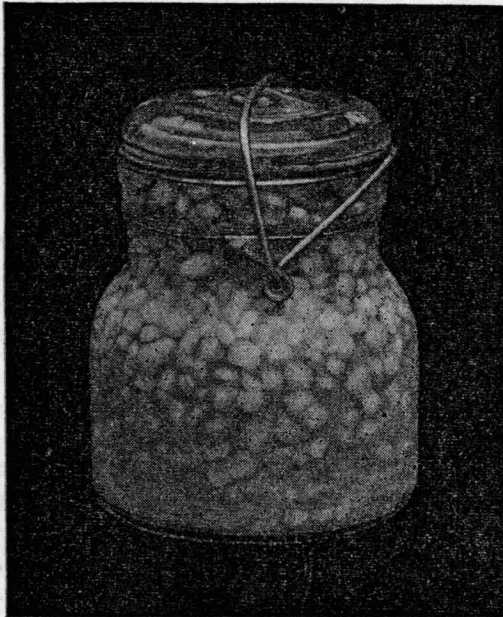
Rubbers should be sterilized by placing in a bowl of boiling water and allowing them to remain for three minutes.

Packing or Filling the Jars.—Remove the jars from the sterilizer, prepare the fruits or vegetables, and pack them in the jars in symmetrical layers, using a thin reed paddle or a spoon to push into place and to remove air bubbles. Pack right into the neck of the jars, filling with water, brine, or syrup, as the packing proceeds. Wipe clean the rim of the jar and place the rubber thereon. Push spring down lightly and place jar in the canner holding tepid water. Never place a cold or even cool jar in boiling water, as there is danger of breakage.

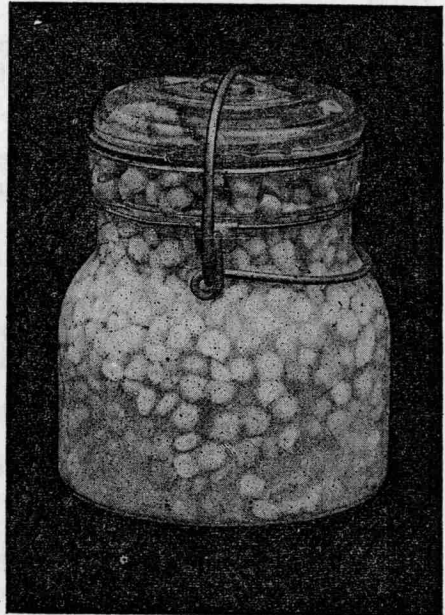
Processing.—When the water begins to boil, count time. Consult the time-table for glass, noting the exact number of minutes, and never cut this time short. Have a clock handy and do not guess at time.

Leave the jars lightly sealed during the whole processing, and when the time is up remove one at a time from the canner, seal tightly, and set aside.

It can be seen that exhaustion and processing take place at the same time with glass. This method prevents the blow-out of rubbers and makes the jars easy to handle. In processing a glass jar for three successive days, allow the jar to remain lightly sealed for the first day's processing, sealing



Jar as Placed in Cooking Vessel Before
Being Tightly Sealed



Jar Tightly Sealed

tightly as you remove from the canner. Set aside until the next day. On the second day raise the clamp of the jar, place the jar in tepid water in the canner, process or boil for the same length of time as on the first day. Remove from the canner and seal tightly. Set aside until the third day, when the same process should be repeated.

Shrinkage of Water in a Jar.—If the water shrinks in a jar, as it will frequently do with string beans and peas, have a kettle of boiling water ready and, as the jar is taken from the canner, open and pour in boiling water until the jar is filled. Tightly seal immediately and process 10 minutes.

Processing Time for Glass Longer Than for Tin.—It is necessary to process products packed in glass jars longer than those packed in tin. Glass is not as good a conductor of heat as tin, and we therefore add five to ten minutes to the time given for tin when canning in glass.

Compare the time-tables.

Cooling.—Be careful not to set hot glass jars in a breeze or on a cold table top. Do not permit jars to touch each other. It is well to cover the table with a cloth.

Labeling.—Have every jar brightly polished and place label midway between the seams and one-quarter inch from the lower edge. For exhibition purposes all labels are pasted underneath the glass jar.

CANNING FRUITS AND BERRIES IN GLASS AND TIN

Dewberries, Blackberries, Raspberries, and Huckleberries.—To can dewberries, blackberries, raspberries, and huckleberries the following method will prove satisfactory: Gather berries when ripe but firm. Place in a muslin sack and plunge into boiling water one minute (blanch). This will slightly soften the berries and allow the packing of almost twice as many in a can or jar. It will also prevent the condition where berries rise to the top of the jar.

Pack the sterilized can to within one-quarter inch of the top with berries. Fill glass jars quite full. Fill the spaces and cover the berries with a syrup made of 1 gallon of water and 1 pint of sugar. (Use Syrup No. 2 or No. 3 if sweeter berries are desired.)

The flavor of all canned berries is finer when syrup or sugar is added.

Process No. 3 tin cans 8 minutes.

Process quart glass jars 13 minutes, permitting jars to remain lightly sealed while processing. Lift jars from the canner and seal tightly immediately.

Read carefully the chapter on "Canning in Glass." Canned strawberries do not make a very attractive product. They shrink badly and lose their color. If they are canned, the recipe for blackberries may be followed.

Huckleberries.—Huckleberries should be canned just as are blackberries. Care should be taken that they are well stemmed and perfectly clean before blanching.

Huckleberries should be canned in lacquered tin, as frequently the acid will eat through the seams of a plain tin can. Glass jars are best.

Peaches.—Clingstone peaches are best for canning and should be selected when they are fully ripe and of uniform size and color. Never pack fruit of varying colors in the same jar.

Peeling Clingstone Peaches.—Firm peaches may be peeled by placing them in a muslin bag and plunging into a boiling solution made from 4 tablespoonfuls of concentrated lye to 1 gallon of water. Allow the fruit to remain from 20 to 30 seconds and plunge immediately into plain boiling water for the same length of time. The last plunge is into a large vessel of cold water, where the peaches are emptied from the bag and the skin removed. If peaches remain too long in the lye discoloration results. When semi-cling peaches, such as the Elberta, or a soft peach is canned, they may be peeled by first plunging into boiling and then into cold water. It is difficult to peel ripe soft peaches without dipping.

After peeling, cut peaches into halves and remove the pit. Have ready a boiling syrup made of 1 pound and 14 ounces of sugar and 1 gallon of water (Syrup No. 2). For extra fine peaches use Syrup No. 4. Add a few cracked peach pits to the boiling syrup to improve the flavor and remove when syrup is cold. Drop peaches into boiling syrup one-fourth at a time, allowing them to cook for 1 minute, or until tender but not soft.

NOTE:—Fruit may be successfully canned without the use of sugar; and when there is a scarcity, it is sometimes necessary. Sugar is not used to preserve the fruit, but to bring out the flavor and improve the taste. Even a small amount of sugar will greatly improve flavor. A No. 1 syrup may be used where heavier syrups are quoted.

Place in jars in overlapping layers with the pit side down and the stem end towards the center of the jar (see cut). Add syrup bit by bit when packing and paddle to remove all bubbles. (Use No. 4 syrup when packing in jars. Only a small amount is necessary for a close pack.)

Process a quart jar for 25 minutes.

Process No. 3 can 20 minutes.

Read carefully the chapter on "Canning in Glass."

Canned Apples.—Late fall and winter apples which are slightly acid are best for canning. Peel, cut, and drop into a brine made of 2½ ounces of salt and 1 gallon of water. Cook in No. 2 syrup 5 minutes.

Process 8 minutes.

When canning apples in glass, process quart jars 15 minutes.

It is advisable to make mellow summer apples into apple sauce. Pour hot into quart jars and process 15 minutes.

Read carefully the chapter on "Canning in Glass."

Canned Pears.—The Bartlett pear is best for canning. Select ripe, sound, medium-sized fruit (cut in halves, or if large in quarters). Remove all the hard portions around the seed and submerge in brine similar to that used for apples to prevent discoloration.

Plunge the halves or quarters into boiling syrup and allow them to cook until they can be pierced with a straw, remove and pack closely in a No. 3 can or quart jar. Cover with a boiling syrup made of 3 pounds and 9 ounces of sugar and 1 gallon of water.

Process No. 3 can 20 minutes.

Process quart jar 25 minutes.

If pears are to be packed for exhibit purposes, small pears should be cut in halves and layered as are peaches. Larger pears may have a thick slice cut from each of the four sides. Hollow these slightly and pack in layers. The fruit remaining around the core can be ground and used in gingered pears.

Many complaints have come in regarding the hardness and lack of flavor in some canned pears. In every instance it was found that Keiffer pears not thoroughly ripe had been used and no precooking was done. Keiffer pears are not recommended for canning, but a palatable product may be had if the fruit is allowed to ripen thoroughly and care is taken to precook until it is tender. Both Keiffer and Pound pears are better made into preserves.

Canned Figs.—Peel 6 quarts of figs. Bring 2 quarts of No. 3 syrup to boiling and add the figs. Cook until saturated with sugar, but not until fiber breaks down.

Place figs carefully in jars and fill with the syrup.

Process quart jars 30 minutes.

Canned Cherries.—Cherries are usually canned without the seed, and should be put in glass jars or in lacquered tin cans. Large wax cherries are often canned whole. They should be blanched for 1 minute.

Pack seeded or whole cherries in jar to within one-quarter inch of top, fill jar with No. 3 syrup. Process quart jars 30 minutes. Process pint jars 20 minutes.

Read carefully the chapter on "Canning in Glass."

CANNING VEGETABLES IN GLASS AND TIN

4-H Recipes

Canned Tomatoes.—Select only ripe tomatoes for canning. One green or light-colored tomato will ruin the grade of the pack.

Blanch for one minute. The skin may then be removed easily. Do not peel any more than may be immediately canned, as tomatoes ferment quickly.

Be careful to remove with sharp knife the hard part of tomato at stem.

Pack into cans as many whole tomatoes as possible, cutting them only when they are too large to slip in. Fill can to within one-quarter inch of top, press gently and shake down fruit to fill crevices.

A level teaspoonful of sugar and a level teaspoonful of salt added to a No. 3 can or a quart jar of tomatoes improve the flavor of the product.

Use no water with tomatoes. If the can is properly filled the juice will be sufficient. A No. 3 can of tomatoes when filled should weigh 38 ounces.

Process No. 3 tin cans 22 minutes.

When canning tomatoes in glass jars, fill quite full and process quart jars 25 minutes.

Read carefully the chapter on "Canning in Glass."

String Beans.—To can string beans select those that are young and tender and which have few strings. The Green Pod Stringless is a good variety. If the beans are gathered when young and tender, and the strings removed, a good product results. Snap the beans at both ends, string, and place in a thin cotton bag. Blanch from 3 to 5 minutes. This improves the flavor of the beans and allows more to be packed in a can. Pack closely to within one-quarter inch of the top, and fill with hot water. Add 1 level teaspoonful of salt. (Instead, a brine may be used: 1 gallon of water and one-third cup of salt.) Process 1 hour.

For No. 10 cans use 1 level tablespoonful of salt and process 2 hours. Turn cans over once or twice while processing.

Beans should be canned the same day they are gathered. "Straight from the Vine to the Can" should be the motto.

Stale or mature beans necessitate processing with steam pressure.

When canning string beans in glass jars, process quart jars 1 hour and 15 minutes.

Read carefully the chapter on "Canning in Glass."

Soup Mixture.—Five quarts tomatoes, 2 quarts corn, 2 quarts okra or lima beans, 2 tablespoonfuls sugar (level), 2 tablespoonfuls salt (level). Scald and peel tomatoes, cutting out green or hard spots. Chop and measure. Cut young and tender field or sugar corn from cob. Slice okra in rings one-half inch thick. Place all in open agate kettle and boil until thick. Pour in No. 2 cans while hot, seal, and process 1 hour. Process a No. 3 can 1½ hours.

Use an asbestos mat under the kettle when boiling soup mixture. It is very easily scorched.

When canning soup mixture in glass jars, process quart jars 1½ hours. Process pint jars 1 hour.

Read carefully the chapter on "Canning in Glass."

Brunswick Stew.—Five pounds chicken, squirrel, or veal, 2 quarts corn, 2 quarts butterbeans, 5 quarts tomatoes, 1 quart okra, 2 tablespoonfuls sugar, $2\frac{1}{2}$ tablespoonfuls salt.

Cut chicken or meat into small pieces. Cover with cold water and simmer until tender (add more water if necessary). Remove bones, add vegetables, and cook until very thick. Pour while hot into No. 2 cans, seal, and process for 40 minutes in a steam-pressure canner at 15 pounds pressure, 250 degrees F. (Do not use a hot-water canner for processing this product.)

Tomato Ketchup.—Select only ripe tomatoes for ketchup; wash, but do not peel; cut out green cores and bad places; quarter, measure, and place on stove in open-top porcelain-lined or agate vessel. For every gallon of tomatoes add 1 level cup of fine chopped onions. Boil until both tomatoes and onions are soft. Strain juice and pulp through a coarse wire sieve, mashing through all the pulp possible. Measure this strained pulp and juice and proceed as in the following recipe:

- 2 gallons strained mixture tomatoes and onions,
- $2\frac{1}{2}$ level teaspoonfuls ground cloves,
- 3 level teaspoonfuls ground ginger,
- 2 level teaspoonfuls ground red pepper,
- 3 level tablespoonfuls ground allspice,
- 1 level tablespoonful ground black pepper,
- $1\frac{1}{2}$ level cup ($\frac{1}{2}$ -pint cup) sugar,
- $\frac{3}{4}$ level cup ($\frac{1}{2}$ -pint cup) salt,
- 1 quart vinegar.

Place strained tomatoes in agate vessel; add spices, sugar, and salt; boil until thick; then add hot vinegar slowly and let boil 30 minutes before beginning to bottle mixture.

Use clear flint 10-ounce grape-juice bottles. Wash well with soda and place in vessel of hot water until ready for use. It is best to put wire netting in the bottom of the vessel, place the bottles filled with water thereon, and let come to a boil, thus sterilizing. Pour out water. Fill hot bottles with boiling ketchup. Cork tightly.

The measures for all recipes must be level. These measures have been taken accurately, and one should get good results if directions are followed to the letter.

A good ketchup may be made in winter by using 5 cans of 4-H tomatoes, 1 cup of chopped onions, and half the quantity of all other ingredients mentioned in the above recipe.

Chili Sauce.—Tomatoes for chili sauce are mashed through a colander instead of through a sieve, thus allowing the seed to remain in the finished product. Use the same recipe as for tomato ketchup, adding 2 level cups chopped green sweet bell peppers (leaving out seed), another level teaspoon of ground red pepper, and 1 level tablespoonful of salt. Boil until quite thick—much thicker than ketchup. Put up in pint or half-pint glass jars, sealing as in canned products.

Sweet Potatoes.—The Nancy Hall, Norton Yam, or other varieties of yellow potatoes are best for canning. Select potatoes of medium size as nearly uniform in shape as possible; place in wire trays or sacks and boil with skins on until three-fourths done. Remove peeling while very hot, cut in slices three-quarters of an inch thick, pack in a No. 3 can to within one-quarter inch of top, using only 2 tablespoonfuls water in a can. This is known as a dry pack, and is the proper commercial pack. Potatoes should be packed rapidly after parboiling, as they turn dark upon standing.

Process No. 3 can 3 hours.

When canning sweet potatoes in glass, process quart jars 3 hours. Process pint jars $2\frac{1}{2}$ hours. If steam-pressure canner is used, see time-table.

An exhibit of sweet potatoes may contain small whole potatoes or sliced potatoes.

Read carefully the chapter on "Canning in Glass."

Canned Baby Beets.—When canning beets, use only young and tender ones, not over $1\frac{1}{2}$ inches in diameter, preferably 1 inch.

Gather beets and allow at least 2 inches of stem and all of the root to remain. Wash, but do not peel; plunge into boiling water, and cook until three-fourths done.

Remove peeling, stem and root, grade as to size, and pack symmetrically, filling with hot water as you pack. (Never use cold water with beets.)

Seal. Process a No. 3 can $1\frac{1}{2}$ hours. (Use lacquered can.)

If large beets are to be used, boil three-fourths done. Slice in quarter-inch slices, and proceed as with small beets.

When canning beets in glass jars, process quart jars 1 hour and 40 minutes. Process pint jars 1 hour and 20 minutes.

If steam-pressure canner is used, see time-table.

Read carefully the chapter on "Canning in Glass."

Packing Pimientos in Tins.—Select sound, uniform pimientos of medium size. To remove seeds, cut around the stem of each with a slender paring knife and remove the inside partitions. To peel, place the peppers in a hot oven from 6 to 10 minutes (until the skin blisters and cracks), being careful not to allow them to burn. Then remove the skin with a slender paring knife. Flatten and pack in horizontal layers. Place whole uniform peppers in the cans, allowing four for the flat No. 1 can and eight for the No. 2 can.

This number makes the standard pack, the net weight of which should not be less than 1 pound for a No. 2 can and 8 ounces for a flat No. 1 can. The peppers should be so selected as to fill the cans. No liquid is used. The processing extracts a thick liquor which almost covers the peppers. Process at boiling temperature, No. 1 cans for 15 minutes, No. 2 cans for 25 minutes.

When canning peppers in glass, use a 12-ounce or a pint jar and process 30 minutes.

Read carefully the chapter on "Canning in Glass."

Fractional Sterilization, or the Three-Day Process.—Such vegetables as corn, beans, peas, squash, spinach, pumpkin, etc., cannot be sterilized in one day's processing at 212° F. The heat is not sufficient to destroy spores, therefore the following method is required if a hot-water canner is used:

Vegetables are prepared and packed as heretofore directed, and the filled cans placed in the canner and processed a given length of time to kill all active bacteria. This is usually accomplished in one cooking, but the spores from which bacteria develop are not destroyed. When the can is set aside to cool these spores develop into active bacteria, and by placing the can in the canner the second day in the same manner and for the same length of time as on the first, these bacteria are destroyed. Some spores are late in developing and bacteria appear after the second boiling, therefore it is necessary to place the can in the canner again on the third day and process the prescribed length of time. This completes the sterilizing process. After each day's processing the cans should be cooled quickly and set aside until the next day.

PRESERVING PRODUCTS IN GLASS

Process glass jars for the required number of minutes on first day. Push springs down tightly as you remove the jars from the canner. On the second day raise spring after the water has begun to boil, and close tightly when removing from the canner. Raise springs again on the third day when jars are in the canner, and seal tightly as jars are removed.

For screw-top jars, do not disturb the seal at the second and third processing unless the rubber has blown out.

Corn.—When canning corn, select that which is young and tender—at the milky stage—and see that it goes into the can immediately after it comes from the garden.

Sugar corn is best for canning, a particularly good variety being "The Country Gentleman." When sugar corn cannot be had very young, tender field corn is sometimes used.

Blanch corn on the cob for 2 minutes and cut from the cob with a sharp knife. If any of the grain is left after cutting, scrape off with the back of a knife.

Place the cut corn in a kettle and cover with hot water. Bring to a boil and boil for 10 minutes.

Pack in No. 2 cans or hot pint jars to within 1 inch of the top. If there is not sufficient water with the precooked corn, add enough boiling water to cover the grains. Add 1 level teaspoonful of sugar to each can. If field corn is used, add 2 level teaspoonfuls.

Precooking of corn makes a more uniform product, as it provides in a great measure for the swelling of the grains before they are packed in the cans. It insures, also, a high temperature at the center of the can at the beginning of the processing.

Seal No. 2 cans. Place in the canner and process for 1 hour and 15 minutes on each of three successive days. After the first day's processing the can is removed, cooled quickly by placing it in a tub of cold water, and is set aside until the next day.

When the water in the canner is boiling on the second day, place the cans therein and again process for 1 hour and 15 minutes. Remove, cool as on the first day, set aside for 24 hours, and on the third day proceed as on the second.

This three-day method is the only sure way of preserving corn when a hot-water canner is used.

Corn should be processed, if possible, in a steam-pressure canner. (See steam-pressure time-table.)

When canning corn in glass use a pint jar—never anything larger—and observe the rules given in the chapter on "Canning in Glass."

Garden Peas.—Use No. 2 cans or pint jars when canning peas, as it is very difficult to sterilize them in larger containers.

Peas should be freshly gathered, and it is essential that they be graded. Shaking peas through wire netting of different sizes will grade them nicely.

After grading, place small peas in a muslin sack and blanch for 3 minutes. Large or older peas must be blanched 5 minutes.

Pack peas in No. 2 can, fill with brine, and add 1 teaspoonful of sugar. Exhaust 3 minutes and process 1 hour and 15 minutes. For older peas process 1½ hours.

Peas must be processed the same length of time on each of three successive days.

A steam-pressure canner is best when canning peas.

When canning peas in glass, process pint jars of tender peas 1½ hours. Process pint jars of older peas 2 hours on each of 3 successive days. (If pressure canner is used, see time-table.)

Read carefully the chapter on "Canning in Glass."

Cornfield Peas.—Gather peas when young and tender, shell, place in muslin sack, and plunge in boiling water and allow to precook for 10 minutes. Remove and pack while hot in cans. Add 1 teaspoonful of salt and fill to within one-quarter inch of the top with hot water.

Process a No. 2 can 2½ hours. Process a No. 3 can 3 hours. Older field peas will require a three-day sterilization period of 1½ hours each day.

Steam pressure is best for peas. See time-table.

Lima Beans.—Use No. 2 can or pint jar for beans. Select young and tender lima or butter beans, grade them as to size, blanch from 2 to 4 minutes, and pack can or jar to within one-half inch of the top. Fill can or jar with brine (1 gallon of water and one-third cup of salt).

Process 1 hour and 10 minutes on first day. Remove from canner and set aside for 24 hours.

After the water is boiling in canner on the second day, place the cans therein for a second processing or boiling of 1 hour and 10 minutes in length; remove; set aside for 24 hours, and process as on second day.

When canning butter beans in glass, use a pint jar and process 1 hour and 25 minutes on each of three days. Steam pressure is best for lima beans. If pressure canner is used, see time-table.

Read carefully the chapter on "Canning in Glass."

Okra.—Gather young pods, wash in cold water, cut off stem, but do not cut into seed pod. Can okra whole. Place in muslin sack and blanch for 3 minutes.

Pack in jars or cans and fill with brine (1 gallon water to one-third cup of salt.)

Process No. 3 tin cans 1 hour and 10 minutes. Process No. 2 tin cans 50 minutes. Remove from canner after processing and set aside for 24 hours.

After the water is boiling in the canner on the second day, place the cans therein for a second processing of the same length of time as on the first day. Remove from canner and set aside for 24 hours, and process on the third day in the same manner and for the same length of time as on the second day. When canning okra in glass, process 1-quart jars 1 hour and 15 minutes each day. Process 1-pint jars 1 hour each day. If pressure canner is used, see time-table.

Read carefully the chapter on "Canning in Glass."

Squash.—Can only young and tender squash. Cut in pieces and cook 10 minutes after boiling point is reached.

Pack in tin cans or jars to within one-quarter inch of the top. Add 1 teaspoonful of salt to each quart can and fill with hot water.

Process 1½ hours.

Remove from canner and set aside for 24 hours. After water is boiling in canner on the second day place the cans therein for a second processing of the same length of time as on the first day. Remove from canner and set aside for 24 hours, and process on the third day for the same length of time and in the same manner as on the second day.

When canning squash in glass, process quart jars 1 hour and 40 minutes each day. Steam pressure is best for squash. See time-table.

Read carefully the chapter on "Canning in Glass."

Pumpkin.—Pumpkin is canned in the same manner as squash.

Spinach.—Prepare the spinach by cutting off all dead leaves and roots. Wash thoroughly through several cold waters; drain well. Blanch in boiling water for 4 minutes. Drain well, pack in No. 3 cans or jars, cover with boiling salt water (1 teaspoonful of salt to 1 quart of water). Process 1 hour and 15 minutes at boiling on each of three successive days. When canning spinach in glass, process a quart jar 1 hour and 30 minutes on each of three successive days. Steam pressure is best for spinach. See time-table.

Read carefully the chapter on "Canning in Glass."

Use of No. 10 Cans.—Only experienced canners should can in No. 10 cans. It is difficult to sterilize perfectly so large a filled container, and care must be exercised as to what is put in a can and to the processing.

String beans, tomatoes, soup mixtures, peaches, pears, apples, and blackberries are successfully canned in these containers.

Do not can corn, peas, squash, or pumpkin in No. 10 cans.