

UNIVERSITY OF MINNESOTA

Agricultural Extension Division

University Farm, St. Paul

Home Canning of Fruits and Vegetables

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THE FOODS YOU NEED EACH DAY

Milk—1 quart for a child, 1 pint for each adult.

Vegetables—2 servings, especially vegetables of green or yellow color.

Serve either a raw fruit, raw vegetable, or canned tomatoes each day.

For a child, serve tomatoes each day.

Fruit—2 servings.

Whole grain—2 servings in cereals or breads.

Eggs, cheese, meat, poultry, fish—1 to 2 servings.

Water—6 glasses for a child, 8 for an adult.

Fruits and vegetables furnish protection in the form of minerals, vitamins, and roughage in the adequate diet. Present canning methods make it possible to serve fruits and vegetables in the low-cost diet in winter as well as summer. Foods canned by directions given in this bulletin retain practically all their original value with the exception of Vitamin C, of which there is some loss, altho there is less destruction of the vitamin than when cooked by the usual open-kettle methods. Canned tomatoes retain most of the Vitamin C content.

FOOD PRESERVATION BUDGET FOR ONE PERSON

Minnesota housewives need to work out a fruit and vegetable budget for at least 8 months, October 1 to June 1. This suggested budget allows two servings of fruit and two of vegetables besides potatoes each day for one person. To adjust it to family needs, multiply by the number in the home during the winter. Estimate the budget for your family and fill in the last two columns. One-half cup is a serving as used in the budget.

Product	No. of servings per week (½ cup)	No. of weeks	Canned	Stored	Estimated family budget	
					Canned	Stored
Vegetables						
Tomatoes	7 for child	38	66 pt.	1 pk.	....	....
	4 for adult	38	38 pt.		....	....
Greens	4	24	12 pt.	16 lb.	....	....
Peas and Beans						
Fresh	2	36	18 pt.		....	....
Dry	2	44		11 lb.	....	....
Other vegetables	5	38	10 pt.	50 lb.	....	....
Fruit						
Stored	7	22		52 lb.	....	....
Canned	5	36	47 pt.		....	....
Dried	2	39		10 lb.	....	....

DOES IT PAY TO CAN?

Compare the cost of the home-canned product with the price of the commercial product of the same grade. Is there a better use or market for the home-grown products, the fuel, or the homemaker's time? With hot water bath canning, gas or kerosene averages one cent per can for processing; jars, allowing usual breakage, one cent per jar; rubber or lids, new each time, approximately one cent. A pressure cooker is a wise investment for canning as it permits the high temperature necessary to kill bacteria and spores which, if they are present, will cause spoilage. If used for every-day cooking as well as canning, it will pay for itself in saving time and fuel, and preventing spoilage in canning.

CAUSES OF FOOD SPOILAGE

Condition of Food

In all fresh fruits and vegetables, the enzymes that cause ripening also cause decay if not checked. For this reason select and can the foods within two hours from the time they are gathered. Do not allow vegetables to stand in a sack or bushel basket closely packed, as they will soon heat. Do not can vegetables the day after they are gathered.

Yeasts, Molds, and Bacteria

In air, in water, in food, on our hands, our utensils, in fact on everything we touch there are bacteria, yeast, and molds. Yeast and molds are easier to kill than bacteria and do not cause much difficulty in canning for they can be destroyed at boiling temperature, 212 degrees.

Bacteria present the real problem in canning. Growing bacteria may be destroyed at 212 degrees in a short time, but many times bacteria go through a spore or resting state in their life cycle and in this condition are very difficult to destroy.

Flat Sour

Flat sour is a condition which affects the flavor and odor of the food but may not affect the appearance of the product. Flat sour often occurs in asparagus, peas, beans, and corn. The following conditions favor the development of flat sour and occur at different stages from garden to can:

- Allowing food to stand in a warm place before canning.
- Trying to pack too many jars at one time before processing.
- Slow cooling of the finished product.
- Storing in a warm place.

Clostridium botulinum

Clostridium botulinum is an organism that causes food poisoning. It has been found in Minnesota soil, altho not to the extent that it has in the southern and western states. When these bacteria germinate in a closed container a deadly toxin or poison is formed. Ordinary spoilage may be detected by the odor or the appearance of products, but this may not always be true of the *Botulinus* spoilage. To destroy this toxin, every bit of the food must be brought to the boiling point. As some foods heat through very slowly, boil the product for 15 minutes. "Thorough cleaning of garden vegetables and fruits, scrupulous attention to the cleanliness of utensils and cook rooms, selection for preservation of only such fruits as are not overripe and of vegetables, meats and fish that are quite fresh, constitute a first-line of defense against botulism that should always be maintained."¹

Clostridium botulinum can be destroyed in the following ways:

Use 10 per cent salt solution¹—e.g., Brining of vegetables, pickling. See Farmers Bulletin 1438—"Making Fermented Pickles." Edwin Le Fevre.

Processing non-acid vegetables in a pressure cooker at a temperature higher than 212 degrees according to time table.

Note: Time table for non-acid vegetables given by hot water bath canning will not destroy the *botulinus* bacillus if present.

Botulinus bacillus even in an open container is destroyed only at a very high temperature for a long time—5 pounds or 109 C. or 228 degrees F. for 80 minutes; 10 pounds or 115 degrees C. or 240 degrees F. for 50 minutes; or 15 pounds or 121 degrees C. or 250 degrees F. for 20 minutes. The more compactly the food is packed in the container the longer the time is required for the heat to penetrate to the center of the can; hence the difference in time for the various products.

Experimental work shows that canning compounds do not destroy harmful bacteria and are not safe to use.

¹Jordan, E. O. Food Poisoning and Food-Borne Infection. 286 pp. 1931.

STERILIZATION

Through careful scientific work, time tables have been worked out for most food products in containers of different sizes, giving the time and temperature necessary to destroy all bacteria that may be present. "If all organisms are destroyed and the food is sealed steaming hot within a sterile air-tight container, the food is said to be sterilized. The application of heat to food in direct canning in order to destroy bacteria is called processing."² See time tables, pages 14, 15, and 16.

Sealing

The product must be sealed so that no air can reach it.

METHODS OF CANNING

Open Kettle

The food material is cooked in an open kettle and packed into sterilized jars and sealed immediately. There is danger of food becoming contaminated as the jars are being filled. Use this method only for acid fruits.

Hot Pack

Precook the food product in a small amount of liquid until it boils, pack boiling hot into sterilized jars, cover with boiling liquid, and process at once. The precooking takes the place of blanching and cold dip in the cold pack process formerly used. The precooking shrinks the product, making it easier to pack, drives out the air enclosed in the plant tissues, retains the food value, and helps to prevent spoilage by starting the processing with a uniform temperature throughout the container. **Do not pack tightly**, as heat penetrates slowly in closely packed containers, often so slowly that the center of the product is not sterilized in the processing of the can. Pack carefully and avoid spoilage.

CANNING EQUIPMENT

Hot Water Bath Canner

A canner may be made from a wash boiler, a lard can, or a straight-sided kettle that has a tight fitting cover and is large enough to hold a convenient number of jars. The canner must be fitted with a false bottom, or rack, that is an inch high to permit free circulation of water under the jars. It must be large enough to allow the water **one to two inches over** the top of the jars. The

² Canning Fruits and Vegetables at Home. Louise Stanley. Farmers' Bulletin 1471. U. S. Dept. of Agr.

processing time is not counted until the water is **boiling vigorously**. The hot water bath is recommended for acid fruits and tomatoes.

Using Pressure Cooker

With the pressure cooker it is possible to reach the high temperatures necessary to destroy bacteria in spore form. A pressure cooker should be strongly built, the top should clamp on tightly so that there is no leakage of steam. There must be an air outlet, the petcock safety valve, and a temperature gauge. Some pressure cookers are also equipped with a thermometer, which acts as a check on the pressure gauge. The temperature reached in the pressure cooker is in direct proportion to the steam pressure and is dependent upon the air being completely removed. This is accomplished by allowing the steam to escape for seven minutes before the petcock is closed. Time is not counted until the gauge shows the required temperature. Select a pressure cooker of suitable size to use in preparing the daily food as well as for canning. A large cooker is heavy to handle.

Pressure Cooker Sizes and Capacities*

Size of cooker, quarts	Glass jars		Tin cans	
	Pints	Quarts	No. 2	No. 2½
7	5	3	5	3
10	5	3	6	..
11	7	4	10	5
12	7	4	8 to 10	5
16	9	7	16	10
18	8 to 18	5 to 7	14 to 16	10
25	18	7	16	..
40	22	16	27	..
54	32	14	21 to 32	20

* Extension Bulletin 450, Home Food Preservation. Oregon State Agricultural College Extension Service.

To Process with a Pressure Cooker³

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 it securely. If the cover is fastened by several clamps, fasten it 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 petcock.

Allow the petcock to remain open until steam escapes from it in a steady stream for seven minutes, indicating that no air remains inside.

Then close the petcock so that only a trace of steam can escape. Some persons prefer to close the petcock entirely, particularly with

³ From U. S. Dept. of Agr. Farmers' Bulletin 1471. See footnote, p. 4.

small canners in which a great loss of steam is to be avoided because of the danger of becoming dry.

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 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 the 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 petcock.

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 using glass jars or No. 3 or No. 10 tin cans, allow the canner to cool until the steam gauge registers zero before opening the pet cock, and then open it gradually. This is to prevent a too sudden drop in pressure, which would cause the liquid to blow out of the jars. Allow the jars to cool as quickly as possible to room temperature away from drafts, but with the air circulating freely around them. Then invert for a short time to test the seal. (Do not invert the automatic seal jars.)

If tin cans smaller than No. 3 are used, 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, which indicate imperfect sealing. Cans that leak should be opened, the contents heated and re-packed in other cans and completely processed.

Containers

Containers used for canning must permit an air-tight seal.

Glass Jars

Any glass jar that can be sterilized and sealed air tight may be used.

To Test Jars

Look over all jars and covers carefully for cracks, nicks, or other defects. Test them to make sure the jar seals perfectly. Fill the jar one-fourth full of water, put on the cover and rubber, and seal it. Turn the jar over and shake it vigorously. If there is a leak, try another cover, adjusting the clamp until a perfect seal is secured. It is wise to use

new screw-top covers each time. New lids are used each time with the automatic seal jar. Examine the sealing compound on these lids to see if it makes a complete circle. If broken, discard the lid. These jars do not seal completely until the compound hardens, as the jar cools after processing.

Rubbers

Always use new rubbers. A good rubber should be soft and elastic. When stretched, it should return to the original size and shape. If bent sharply it should not break. Rubber deteriorates with age. Do not use any left over from the previous year.

To Seal Jars

Jar	Partial Seal	To Complete Seal
Screw top or Mason	Screw down firmly, turn back one-quarter turn.	Screw tight.
Glass top	Snap the top bail in place, leave the side clamp up.	Turn side clamp down.
Metal lid	Place lid on evenly, screw band or place clamp to hold lid in place.	Do not remove band or clamp till jar is cold. Seal is formed as jar cools. Do not invert until cool.

Tin Cans

Tin cans require the use of a mechanical sealer. If cans are carefully opened, washed at once, and stored safely they may be sterilized and used again. There are three kinds of tin cans:

Plain.—Safe for all foods except the highly colored and for certain protein food stuffs.

R or Sanitary Enamel.—A bright gold enamel is used for highly colored fruits, vegetables, red berries, blue berries, currants, plums, beets, pumpkin, tomatoes.

C Enamel.—A dull gold enamel is used to prevent a discoloration from metallic sulphide formed from the protein of the food during processing, e.g., corn, peas, lima beans, chicken, fish, meat.

Tin cans have the advantage of :

No breakage.

Heat through more rapidly.

Pack into canner compactly.

Can be cooled rapidly, resulting in a finer product.

Easier to handle.

No loss of liquid in processing.

Economical, may be used two or three times.

Tin cans, packed boiling hot, can be sealed immediately for processing. If food is not packed boiling hot the cans must be exhausted before sealing. To exhaust, heat cans until steaming hot in water bath or pressure cooker to draw out all the air before sealing. After processing tin cans, plunge them immediately into cold water to stop the cooking process.

Steps in Canning

For time tables, see pages 14, 15, and 16.

1. Carefully wash all jars, covers, canners, and small equipment to be used.
2. Test jars, covers, rubbers, and lids before starting to prepare the product to can.
3. Put jars, rubbers, and covers in warm water and heat to boiling point, boil 20 minutes.
4. Select only fresh, sound fruits and vegetables in prime condition. Two hours from garden to can is a rule that prevents much spoilage.
5. Wash products thoroly as the most dangerous bacteria come from the soil. In washing lift the products out of the water rather than pour off the water.
6. Grade and sort products for ripeness and size or cut into convenient size for packing, in order to secure more attractive packs.
7. Precook most fruits in syrup, non-acid vegetables in a small amount of water. Remove skins of peaches and tomatoes by immersing them in boiling water and then into cold water.
8. Pack the hot sterilized jars with the hot product, add the hot liquid to within $\frac{1}{2}$ inch of the top. Leave one inch space for peas and corn, which swell in processing period. Add salt to vegetables, $\frac{1}{2}$ teaspoon to a pint, 1 teaspoon to a quart. Use syrups for most fruits.
9. Partially seal glass jars and put them into the canner immediately. Complete the seal for tin cans and put them into the canner.
10. Process acid fruits and tomatoes in water bath. Process non-acid vegetables in a pressure cooker.
11. Use a time table. Do not count time for water bath until water boils vigorously. Use a good thermometer to check, do not guess. Do not count time in the pressure cooker until the gauge indicates the desired pressure. Keep the pressure constant or the liquid will be drawn out of the jars.
12. Remove the jars from the canner. Complete the seal. Plunge tin cans immediately into cold water to stop the cooking of the product. If the liquid has been drawn out of the jar the product will keep, so do not open the can. If the seal is not perfect the can must be reprocessed.

To Check Results

Label all jars with date, process used, and number to indicate jars processed in cooker at the same time.

Beans
July 10, 1933
40 minutes @ 10 pounds
Lot I

Peaches
August 1, 1933
Hot Water Bath
Lot II

Mark all canned products so that those in each lot can be distinguished. Examine the inverted glass jars for signs of leakage. Hold canned products at room temperature two to three 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 dry place (45 to 60 degrees F. is good). 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 and methods improved.

Destroy all foods showing any signs of spoilage. Do not taste food to determine whether or not it is spoiled.

In glass jars there should be no bulging of the rubber, no leakage. In tin cans both ends should be flat and curved slightly inward.

When the can is opened there should not be a sudden outburst of air, spurting of liquid, nor any off odor, cloudiness of liquid, or softness in texture.

All non-acid canned vegetables should be rapidly boiled for 15 minutes or until the center of the food is at boiling temperature. Canned food that shows signs of spoilage should be buried or mixed with one tablespoon of lye and buried where animals cannot touch it.

Approximate Yield of Canned Products from Raw Products

Raw Vegetable	Amount	Pints	Raw Fruit	Amount	Pints
Asparagus	1½ lb.	1	Apples	1 bu.	40
Carrots (20 small)	1½ lb.	1	Blueberries	1 qt.	1
Carrots	1 bu.	40	Peaches	8	1
Chard	1 lb.	1	Peaches, 1 lug	24-28 lb.	16-20
Corn (Golden bantam)	5 ears	1	Peaches	1 bu.	32
Beets (10-15)	1½ lb.	1	Pears	1 bu.	32
Peas (in pod)	3 lb.	1	Raspberries, 1 crate	18 lb.	20-24
Peas	1 bu.	14	Strawberries, 1 crate	24 qt.	26
Spinach	1½ lb.	1	Rhubarb	¾ lb.	1
Spinach	1 bu.	7			
String beans	2 lb.	1			
String beans	1 bu.	20			
Tomatoes	2 lb.	1			
Tomatoes	1 bu.	30			

Gather only the quantity of vegetables that can be canned at once, which will depend upon the processing equipment and the number of workers.

SIRUPS USED IN CANNING

In canning fruits it is advisable to prepare in advance the sirup needed. The degree of concentration of the sirup recommended for different fruits varies and is designated as thin, medium, and thick.

	Sugar	Water
Thin sirup	1 c.	3 c.
Medium sirup	1 c.	2 c.
Thick sirup	1 c.	1 c.

In each case the sugar and water are heated together and stirred carefully until the sugar is dissolved and the sirup brought to a boil. Fruit juice may be substituted for the water in the sirup with marked improvement in the flavor of the finished product.

SERVE CANNED VEGETABLES ATTRACTIVELY

Each vegetable has its own characteristic odor, color, flavor, and texture. Conserve these and you will make vegetables popular in your home. Their rich mineral and vitamin content make vegetables essential to the diet. As 25 per cent of the calcium, 50 per cent of the phosphorus, and 30 to 50 per cent of the iron and much of the vitamin B may be dissolved out into water in which the vegetable is cooked, save the liquid and serve it either with the vegetable or in soups or gravies.

c. = cup, T. = tablespoon, t. = teaspoon.

Tomato Juice

Tomato juice may be served plain or with $\frac{1}{2}$ t. salt and 2 T. lemon juice to 1 pint of strained tomatoes.

Tomato Juice Cocktail

2 c. strained canned or fresh tomatoes	1 t. salt
	$\frac{1}{2}$ t. Worcestershire sauce
$\frac{1}{2}$ t. paprika	1 t. celery salt

If fresh tomatoes are used, peel and press through potato ricer. Combine and add ingredients, chill and serve. Serves 6.

Salads

Tomato Aspic

1 quart cooked tomato	1 c. celery, diced
1 T. gelatine	$\frac{1}{2}$ c. cold water
$\frac{1}{2}$ c. raw carrot, diced	1 onion sliced
1 sprig parsley	3 cloves
1 t. peppercorns	1 small blade mace
1 t. salt	Few grains cayenne pepper
	1 green pepper, cut fine

Soak gelatin in cold water. Cook all ingredients, except gelatin, 30 minutes. Strain, pour over soaked gelatin. This may be poured over shredded cabbage or mixed diced vegetables, raw or cooked, allowed to set, and served with salad dressing, or pour some of the aspic in the bottom of a mold, add a layer of potato salad, the rest of the aspic. Chill, and serve in slices. Serves 8 to 10.

Macedoine of Vegetables

(Boil canned non-acid vegetables 15 minutes, cool, and combine.)

1 pint can peas	1 c. beets
1 c. lima beans	1 head lettuce
1 c. carrots	Thousand Island Dressing

Cut the carrots and beets into cubes, keep each vegetable separate, but mix each with a little of the dressing, place in separate spoonfuls on lettuce leaves, and pass the dressing with the salad. Serves 6 to 8.

Buttered or Creamed Vegetables

The simplest way to serve canned vegetables is to add butter, cream, or white sauce and a small amount of seasonings to the vegetables. Too often the seasonings cover the natural flavor of the vegetables. For green peas, string beans, or corn use top milk or cream, 2 to 4 T. to 1 c. of vegetables.

White Sauce

	Butter	Flour	Milk	Salt
Thin	1 T.	1 t.	1 c.	$\frac{1}{4}$ t.
Medium	2 T.	2 t.	1 c.	$\frac{1}{4}$ t.
Thick	4 T.	4 t.	1 c.	$\frac{1}{4}$ t.

Place butter in sauce pan, melt, add seasonings and flour, let bubble until the flour is yellow, stirring constantly then add hot milk, a little at a time until it is well blended. It is best made in a double boiler in which it may be thoroly cooked without danger of scorching.

Use Thin sauce for

Cream Soups—1 quart to 2 cups sieved or chopped vegetables.
Cream Toast.

Creamed Vegetables—1 cup to 2 cups vegetables to be served in a side dish.

Use Medium sauce for

Creamed Vegetables to serve on the plate—1 cup to 3 cups vegetables.

Escalloped Vegetables—1 cup to 2½ cups vegetables.

Use Thick sauce for Fritters—Souffles.

Tomato Sauce

Cook tomato with onion, bay leaf, or other seasonings. Prepare same as medium white sauce; substitute tomatoes for milk. Use for prepared meats, vegetables, or French toast.

Vegetable Souffle

2 c. medium white sauce	1 t. chopped onion
3 egg yolks	1 c. cooked or canned sieved vegetables
3 egg whites	

Such vegetables as carrots, spinach, cauliflower, and peas can be used. Pour hot white sauce on egg yolks, beating constantly. Add onion and cool. Then add vegetable and fold in the well-beaten egg whites. Turn into a greased casserole, and set in a pan of hot water. Bake in a moderate oven. Serves 6.

Carrots a la King

4 c. diced cooked carrots	1 T. minced green peppers
2 c. hot medium white sauce	1 T. diced celery or $\frac{1}{2}$ t. celery salt
1 t. grated onion	1 t. minced parsley

Add seasonings to the hot white sauce. Pour over carrots that have been heated and drained. Serves 6.

Corn Pudding

2 T. fat	1 can corn
2 T. chopped green pepper or	1 chopped pimiento
$\frac{1}{2}$ t. paprika	$1\frac{1}{2}$ t. salt
1 T. chopped celery or	$\frac{1}{2}$ t. pepper
$\frac{1}{2}$ t. celery salt	3 eggs, well beaten
1 small onion chopped	2 c. milk

Cook celery, onion, and pepper in frying pan for 5 minutes. Add remaining ingredients and turn into a well greased baking dish. Set in a pan of water and bake in a slow oven (325 degrees F.) until a silver knife inserted in the center comes out clean. Serves 6 to 8.

Vegetable and Cheese Casserole

1 c. canned vegetable	$1\frac{1}{2}$ T. chopped onion
$1\frac{1}{2}$ c. scalding milk	$1\frac{1}{2}$ c. American cheese
1 c. soft bread crumbs	$\frac{3}{4}$ t. salt
$\frac{1}{2}$ c. melted butter	$\frac{1}{2}$ t. pepper
2 pimientos (chopped)	Dash paprika
1 T. chopped parsley	3 eggs

Pour hot milk over bread crumbs. Add butter, pimientos, parsley, onion, and grated cheese, and seasonings. Then add the well-beaten eggs. Put vegetables in a well-greased loaf pan and pour the milk and cheese mixture over them. Bake about 50 minutes in a slow oven (350 degrees F.) until the loaf is firm. Serves 6.

Tomato Oysters (18, size of large oysters)

1½ c. tomato (canned or fresh)	1 egg beaten
½ t. salt	About 1¼ c. fine cracker or
¼ t. pepper	bread crumbs
½ t. sugar	Fat for frying

Mix all ingredients, adding crumbs enough to make the mixture stiff enough to drop into flat irregular cakes resembling large oysters. Drop by spoonfuls on hot, greased skillet and fry until brown.

May be served with cheese sauce, or as a vegetable, or with rarebit for a luncheon dish.

Italian Sandwich Paste

2 c. canned tomato	½ lb. finely ground smoked
2 T. fat	dried beef
2 T. flour	½ lb. grated American cheese

Melt fat, add flour and tomato, cook until thickened, then add ground beef and cheese, stirring constantly until cheese is melted. Spread in a thin layer on a platter to cool, then use as a sandwich filling either with or without lettuce leaves. This paste keeps well for several days if kept in a cool place.

Harvard Beets

3 c. cooked (or canned) beets	¾ c. water
½ c. sugar	1 t. salt
½ T. corn starch	2 or 3 cloves
½ c. vinegar	2 T. butter

Mix corn starch and sugar, add vinegar to water, cook (with cloves) until thickened, add small beets, or diced beets, and let stand in warm place one hour. Remove cloves, add butter just before serving. Serve hot. Serves 6.

Spinach Timbales

3 c. cooked or canned spinach	3 T. butter
2 eggs, well beaten	1 t. salt

Mix finely chopped spinach with eggs, add butter and salt. Place in buttered molds, surround with water to the depth of spinach, and bake until firm, 45 minutes to 1 hour in slow oven at 350 degrees F. Serves 6.

Directions and Time Table for Canning—VEGETABLES

Caution: Hot water bath method of canning is not recommended for non-acid vegetables and meat. If use of pressure cooker is not possible, the essential steps in the hot water bath method should be followed very carefully and the full period of time allowed for processing. Begin time for processing when water is boiling (bubbling vigorously). Use thermometer to check. **Before tasting, boil home-canned, non-acid vegetables 15 minutes or until center of food has reached the boiling temperature.** Canned food showing any signs of spoilage should be burned or mixed with 1 tablespoon of lye and buried. Avoid putting it where animals can find it.

Product	Preparation for canning*	Pressure Cooker						Hot-water bath (Boiling water, 212 degrees F.)	Type of tin can
		Pint jars		Quart jars		No. 2 and No. 3 cans			
		Time	Pressure	Time	Pressure	Time	Pressure	Pt. and qt. jars	
		min.	lb.	min.	lb.	min.	lb.	min.	
Asparagus.....	Wash, tie in bundles, place butts in boiling water, cover tightly, boil 2 to 3 minutes, pack hot. Or cut in ½-inch lengths, bring to boil in water to cover, pack hot.....	35	10	40	10	30	10	180	Plain
Beans, string.....	String, wash, cut in ½-inch lengths, if desired, bring to boil, pack hot, pack loosely to within 1 inch of top.....	35	10	40	10	30	10	180	Plain or C enamel
Beans, lima.....	Shell, bring to boil in water to cover, pack hot, pack loosely to within 1 inch of top.....	55	10	60	10	55	10	180	C enamel
Beets, young.....	Wash, leave 1-inch stems and all root, boil or steam 15 minutes, slip skins, pack hot, add boiling water to ½ inch of top. Can only young, tender beets.....	35	10	40	10	30	10	130	Plain
Carrots.....	Scrub, boil 5 to 15 minutes, pack whole, sliced or diced, pack hot.....	35	10	40	10	30	10	120	Sanitary enamel
Corn.....	Can as soon as taken from garden, husk, silk, cut from cob without pre-cooking, add ½ as much boiling water as corn by weight, heat to 190 degrees, pack hot, pack loosely to within 1 inch of top.....	75	15	80	15	70+	15	190	C enamel

15	Greens (includes spinach)†.....	Wash carefully, trim, steam or heat to 180 degrees in covered vessel until completely wilted. Use just enough water to keep from burning, pack hot into containers, 11 oz. drained greens to pt., 22 to qt., pack very hot, pack loosely.....	60	15	65	15	55†	15	180	Plain
	Mushrooms.....	Wash, peel, drop into water containing 1 tablespoon vinegar per qt., pre-cook 3 to 4 minutes in boiling water that contains 1 tablespoon vinegar per qt., pack hot, add boiling water.....	25	10	35	10	25	10	90	Plain
	Peas.....	Wash, shell, bring to boil in water to cover, pack hot. Add liquid to within 1 inch of top.....	45	10	55	10	45†	15	...	C enamel
	Pumpkin and Squash.....	Wash, cut into large sections, bake or steam to 180 degrees, until easily removed from shell, pack very hot.....	60	15	75	15	No.2 60	15	240	R or sanitary enamel
	Tomatoes.....	See time table for fruits.....	..	..	..	..	No.3 70	..	...
	Spinach, sieved for infants†.....	Wash, trim, boil in small amount of water 15 min., press through sieve, bring to boil, pack loosely in ½ pt. jars, add ⅛ teaspoon salt.....	60	15	..	..	55†	15	180	
	Vegetable soup†...	Use any combination of vegetables desired or available, such as peas, carrots, and celery. Include green leafy vegetable. Wash, trim, chop, boil 5 min. Use process time of ingredient requiring longest cooking.....	70	15	..	..	70†	15	180	

* Unless otherwise specified, add 1 level teaspoon of salt to each quart jar of vegetable (one-half teaspoon to each pint). Then add hot liquid in which product was cooked to within one-half inch of top of jar.

† Use pint or No. 2 cans.

Time-Table for Canning Fruits, Tomatoes, Pickled Beets, and Ripe Pimientos*

The times given for processing in boiling water apply only to places with altitudes of 1,000 feet or less. For all altitudes above 1,000 feet the time should be increased 20 per cent for each additional 1,000 feet.

When half-gallon glass jars are used, add five minutes to times given for pint and quart glass jars.

16

Product	Method of treatment before processing	Processing period in boiling water		Type of tin can
		Pint and quart glass jars	No. 2 and No. 3 tin cans	
Apples	Slice, quarter, or halve, then pack in containers and cover with boiling sirup.	<i>Minutes</i> 15	<i>Minutes</i> 10	Plain tin
		Or boil whole in sirup, or bake as for serving, and cover with sirup, and pack hot... 5	5	
Apricots	Same as peaches.	Or pack hot in form of apple sauce..... 5	5	Do.
		Blackberries	Pack in containers. Fill with boiling hot, medium sirup..... 20	15	Sanitary enamel
Blueberries	Or precook and pack hot..... 5	5		Do.
Raspberries	Pack in containers, cover with boiling sirup, using thick sirup for sour cherries, and medium for sweet..... 25	Or remove pits, add sugar as desired, bring to boil, and pack..... 5	20	Do.
Cherries		Same as berries.	5	Do.
Currants	Pack in containers. Fill with boiling hot, thick sirup..... 20	Or prepare sauce, using sugar as desired. Fill hot..... 5	15	Sanitary enamel
Gooseberries		Scald, dip into cold water, and peel. Firm Clingstone, lye or hand peeled. Cut into size desired, removing pits. Fill containers, then add sirup of desired consistency, in which one cracked peach pit for every quart of sirup has been boiled..... 20 [†]	5		Do.
Peaches	Pare and cook for four to eight minutes in boiling medium sirup. Pack hot in containers and fill with the boiling sirup..... 20	Fill with boiling thin sirup..... 30	15 [†]	Plain tin
Pears		Prick. Fill in containers. Cover with boiling medium sirup..... 20	30 [†]	
Pineapples	Peel, core, remove eyes. Cut into convenient cross sections. Pack in containers. Fill with boiling thin sirup..... 30	Or bring to boil, using sugar as desired. Fill hot into containers..... 5	25	Do.
Plums		Cut in half-inch lengths. Add one-fourth as much sugar as rhubarb by measure. Bake until tender in covered baking dish. Pack in hot containers..... 5	15	
Rhubarb	Or pack uncooked with boiling sirup..... 20	To each quart add 1 cup of sugar and 2 tablespoons of water. Boil slowly for 15 minutes. Let stand overnight in the kettle. Reheat to boiling. Fill containers hot..... 5	5	Do.
Strawberries		Scald and peel. Pack whole or cut in pieces. Cover with hot tomato juice. Add 1 teaspoon salt to each quart..... 45	5	
Tomatoes	Select firm, ripe tomatoes. Wash well and drain. Cut into sections. Add a small quantity of water to start cooking and simmer until softened. Stir occasionally to prevent burning. Put through sieve fine enough to remove seeds. Bring juice to boiling and fill immediately into hot containers..... 5	boiling hot..... 30	35	Do.
Tomato juice		Heat in hot fat or oven to loosen peel. Peel and pack in small containers. Add one-half teaspoon salt to each pint..... 40 [§]	5	
Pickled beets	Precook, peel, and slice in containers. Cover with mixture of vinegar and sugar, boiling hot..... 30	..... 5	5	Do.
Ripe pimientos		..... 5	5	
		..... 40 [§]	30||	Sanitary enamel

*Farmers' Bull. 1471.

† For ripe fruit.

‡ For firm fruit.

§ For pint glass jars.

|| For No. 1 and No. 0 cans.