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**HOME CANNING
AND DRYING**
of
**VEGETABLES AND
FRUITS**

With directions for making Jellies and Fruit Butters and for
Fermentation, Salting and Pickling

**PART I—HOME CANNING
PART II—HOME DRYING, ETC.**

1918

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National War Garden Commission

The Maryland Building, Washington, D. C.

If you do not need the information contained in this book please help
by handing it to some person who may have use for it.

TIME TABLE FOR BLANCHING AND STERILIZING

The following time-table shows blanching time for various vegetables and fruits, and also sterilizing time, not only in the hot-water bath outfit, but also in equipment for sterilization by the water-seal method, the steam-pressure method and the aluminum steam-cooker method:

Vegetables	Blanching	Sterilizing			
		Hot-water	Water seal	Steam pressure in pounds	
				5 to 10	10 to 15
	Minutes	Minutes	Minutes	Minutes	Minutes
Asparagus.....	10 to 15	120	90	60	40
Beets.....	5	90	80	60	40
Brussels Sprouts.....	5 to 10	120	90	60	40
Cabbage.....	5 to 10	120	90	60	40
Cauliflower.....	3	60	40	30	20
Carrots.....	5	90	80	60	40
Corn.....	5 to 10	180	120	90	60
Greens.....	15	120	90	60	40
Lima Beans.....	5 to 10	180	120	60	40
Okra.....	5 to 10	120	90	60	40
Parsnips.....	5	90	80	60	40
Peppers.....	5 to 10	120	90	60	40
Peas.....	5 to 10	180	120	60	40
Pumpkin.....	See directions	120	90	60	40
Salsify.....	5	90	80	60	40
Sauerkraut.....		120	90	60	40
String Beans.....	5 to 10	120	90	60	40
Squash.....	See directions	120	90	60	40
Tomatoes.....	To loosen skins	22	18	15	10
Fruits					
Apples.....	1½	20	12	8	
Apricots.....	1 to 2	16	12	10	
Blackberries.....	none	16	12	10	
Blueberries.....	none	16	12	10	
Dewberries.....	none	16	12	10	
Cherries, sweet.....	none	16	12	10	
Cherries, sour.....	none	16	12	10	
Currants.....	none	16	12	10	
Gooseberries.....	1 to 2	16	12	10	
Oranges.....	1 to 2	12	8	6	
Pears.....	1½	20	12	8	
Peaches.....	To loosen skins*	16	12	10	
Plums.....	none	16	12	10	
Pineapples.....	3 to 5	30	15	10	
Quinces.....	1½	20	12	8	
Raspberries.....	none	16	12	10	
Rhubarb.....	1 to 3	20	15	15	
Strawberries.....	none	16	12	10	
Fruits without sugar.....		30	20	12	

*Some peaches do not peel readily even if dipped in boiling water. In such cases omit dipping in boiling water and pare them.

The time given in this table and in the special instructions on pages 11, 12, 13 and 14 is for quart jars. For pint jars deduct 5 minutes. For 2 quart jars add 30 minutes.

Homemade and Commercial Hot-Water Bath Outfits are not satisfactory for canning at high altitudes as the temperature of water in them does not reach 212° F. In such localities Water-Seal and Steam Pressure Outfits give better results, as much higher temperatures can be maintained.

The time here given is for 1 quart jars and fresh products at altitudes up to 1,000 feet above sea level. For higher altitudes increase the time 10 per cent for each additional 500 feet. For example, if the time is given as 120 minutes in the table and your location is 1,500 feet above sea level, the time should be made 132 minutes; for 2,000 feet, 145 minutes.

The time here given is for fresh, sound and firm vegetables. For vegetables which have been gathered over 24 hours increase the time of sterilization by adding one-fifth.

PART I

HOME CANNING MANUAL

To save vegetables and fruits by canning this year is a patriotic duty. The war makes the need for Food Conservation more imperative than at any time in history. America is responsible for the food supply of her European Allies. The American family can do nothing more helpful in this emergency than to Can All Food That Can be Canned. In this way the abundance of the summer may be made to supply the needs of the winter.

CANNING IS FOOD THRIFT

The National War Garden Commission's campaign for five million or more War Gardens has brought about the creation of a vast food supply hitherto greatly neglected. To utilize this to the best advantage calls for Canning operations in every household throughout the nation.

The preservation of foodstuffs by Canning is always effective Food Thrift. It enables the individual household to take advantage of summer's low prices for vegetables even if no garden has been planted. It effects the saving of a surplus of food stuffs that would otherwise be wasted through excess of supply over immediate consumption. It eliminates the cold storage cost that must be added to the prices of commodities bought during the winter. Of vital importance, also, is that it relieves the strain on transportation facilities of the country. This phase has been especially emphasized for this year by the unprecedented traffic situation. All this increases the need for Home Canning and proves that this is a national obligation.

CANNING MADE EASY BY MODERN METHODS

By the Single Period Cold-Pack method it is as easy to can vegetables as to can fruits and this year it is more useful. By the use of this method canning may be done in the

kitchen or out of doors. It may be done in the individual household or by groups of families. Community canning is important in that it makes possible the use of the best equipment at small individual outlay and induces Food Conservation on a large scale. Community canning by school children, under the direction of competent teachers, is especially valuable.

COLD-PACK IN THE SOUTH

In some parts of the Southern States there has been complaint as to results obtained in the use of the Single Period Cold-pack method, but inquiry and research have shown that in most cases the trouble arose from lack of care in following instructions and was not to be blamed on the method itself. With proper care the results in the South are as good as elsewhere.

This Manual presents all necessary instructions for canning vegetables and fruits, in a manner which may be so readily understood that the work is no longer a problem, but is so simple that any adult or child may do it with success.

COMMUNITY WORK

One of the best methods to follow in canning and drying operations is for several families to club together for the work. The work may be carried on at a schoolhouse, in a vacant storeroom, at the home of one of the members or at some other convenient and central location where heat and water can be made available. By joining in the purchase of equipment each participant will be in position to save money as against individual purchases and at the same time have the advantage of larger and more complete equipment. The cost is slight when thus divided and the benefits very great to all concerned.

For a co-operative enterprise it is well to have a committee of from three to five to take charge of all details. First determine how many people will take part in the work, how much each proposes to can or dry, what



FIG. 1. Home-made rack for placing in wash-boiler for holding jars. The cross pieces should be thick enough to allow circulation of water underneath jars.

vegetables and fruits each will furnish and such other information as will have a bearing on the selection of equipment. After deciding how much money will be needed have each member contribute his or her proportion, determined by the amount of canning or drying he or she proposes to do.

The equipment should be bought as early as possible, to prevent disappointment in delivery which is almost certain to follow delay. This equipment may be ordered through a local dealer or direct from the manufacturers. The National War Garden Commission publishes a list of manufacturers which may be had upon application.

The equipment may be used by the individual members, on a schedule arranged by the committee, or a working force may be appointed to do all the work, receiving pay in the form of a percentage of the product.

Publicity is important in keeping interest aroused and there should be a committee to arrange with the local papers for the publica-

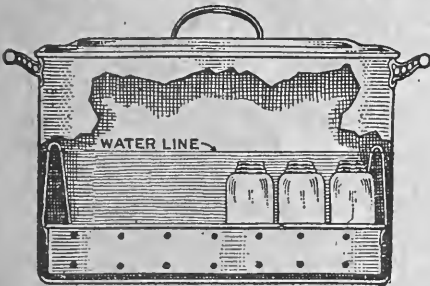


FIG. 2. Ordinary wash-boiler used as home canner. The jars are resting in a rack which is perforated at sides and bottom to permit free circulation of boiling water around them. A rack for this purpose may be made at home, of strips of wood as shown in Fig. 1, or it may be made of wire mesh, cut to fit the boiler.

tion of information concerning the enterprise. This serves as an incentive to others.

STERILIZATION OF FOOD

The scientist has proven that food decay is caused by microorganisms, classed as bacteria,

yeasts and molds. Success in canning necessitates the destruction of these organisms. A temperature of 160° to 190° F. will kill yeasts and molds. Bacteria are destroyed at a temperature of 212° F. held for the proper length of time. The destruction of these organisms by heat is called sterilization.

METHODS OF CANNING

There are five principal methods of home canning. These are:

1. Single Period Cold-pack Method.
2. Fractional or Intermittent Sterilization Method.
3. Open Kettle or Hot-pack Method.
4. Cold Water Method.
5. Vacuum Seal Method.

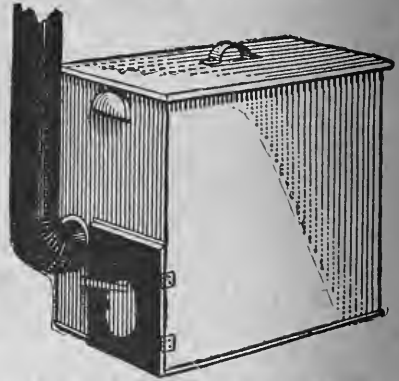


FIG. 3. Commercial canner for Hot-water Bath—Cold-pack method. It has a fire-box, vat for holding jars and cans, smoke pipe and cover. It is especially good for outdoor use. Made to burn wood or charcoal, but oil or gas heater may be used by being set inside the fire-box. A small iron grate placed in fire-box will make possible the use of coal. Chips, cobs, brush or broken fence rails may be used for fuel. This type sells at \$15 for small sizes, and up to \$200.

Of these methods the one recommended for home use is the Single Period Cold-pack method. It is much the best because of its simplicity and effectiveness and in this book detailed instructions are given for its use. The outlines of the various methods are as follows:

1. *Single Period Cold-pack Method:* The prepared vegetables or fruits are blanched in boiling water or live steam, then quickly cold-dipped and packed at once into hot jars and sterilized in boiling water or by steam pressure. The jars are then sealed, tested for leaks and stored. Full details of this method are given on page 5 and the pages following.

2. *Fractional or Intermittent Sterilization Method:* Vegetables are half sealed in jars and sterilized for 1 hour or more on each of

three successive days. This method is expensive as to time, labor and fuel and discourages the home canning of vegetables.

3. *Open Kettle or Hot-pack Method:* Vegetables or fruits are cooked in an open kettle and packed in jars. There is always danger of spores and bacteria being introduced on spoons or other utensils while the jars are being filled. This method should never be used in canning vegetables. Even with fruits it is not as desirable as the cold-pack.

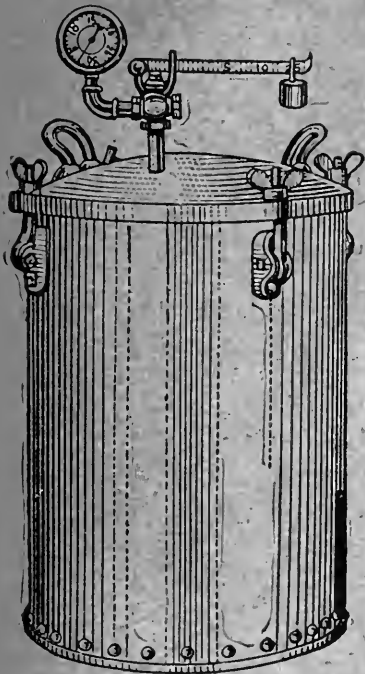


FIG. 4. Steam Pressure canner with capacity of 10 quart jars, with steam gauge registering up to 30 pounds pressure. This size costs \$18. Larger sizes may be had, ranging from \$33 for daily capacity of 300 to 500 cans up to \$90 for daily capacity of 500 to 1,000 cans. For community canning daily capacity of 10,000 to 30,000 cans may be had for \$960.

4. *Cold-water Method:* Rhubarb, cranberries, gooseberries, and sour cherries, because of their acidity, are often canned by this method. The fruits are washed, put in sterilized jars, cold water is added to overflowing, and the jar is then sealed. This method is not always successful as the acid content varies with the ripeness and the locality in which the fruits are grown.

5. *Vacuum Seal Method:* Vegetables are washed, blanched, cold-dipped and cooked as for table use; packed and sealed in especially made vacuum seal jars. The jars must be

well made and the work properly done to bring about satisfactory results

ADVANTAGES OF THE SINGLE PERIOD COLD-PACK METHOD

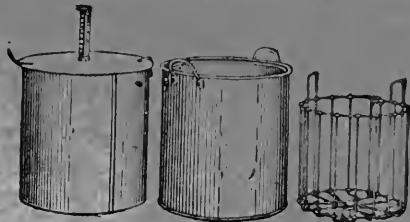


FIG. 5. A simple type of canner which may be bought for use in the Cold-Pack method. This is a Water-seal Outfit. On the left is shown the cover, with the meter. In the center is a double walled vat or holder. On the right is a wire grate for jars and cans. This canner makes possible the use of greater and more uniform heat than the Hot-water Bath Outfit, and, therefore, shortens the time of sterilization, and saves fuel. This canner is placed on the stove.

The Single Period Cold-pack method is a simple and sure way of canning. It insures a good color, texture and flavor to the vegetable or fruit canned. In using this method sterilization is completed in a single

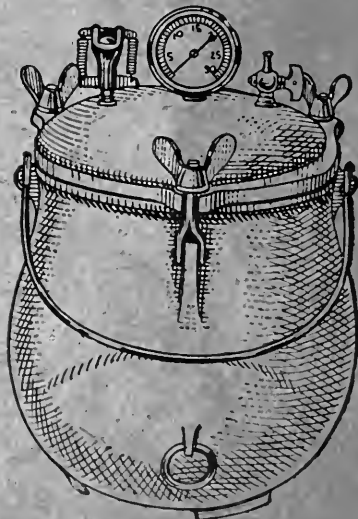


FIG. 6. Aluminum Pressure canner and cooker, giving pressures from 5 to 25 pounds. The prices range from \$18 for family size to \$30 for hotel size.

period, saving time, fuel and labor. The simplicity of the method commends it. Fruits are put up in syrups. Vegetables require only salt for flavoring and water to fill the container.

Another advantage is that it is practicable to put up food in small as well as large quantities. The housewife who understands the

process will find that it pays to put up even a single container. Thus, when she has a small surplus of some garden crop she should



FIG. 7. One type of home canner and steam cooker which holds 14 one quart jars. This costs \$10 in tin and \$20 in copper. Other sizes range from \$7 to \$25 for tin and \$14 to \$43 for copper.

take the time necessary to place this food in a container and store it for future use. This is true household efficiency.

SINGLE PERIOD COLD-PACK EQUIPMENT

The Homemade Outfit.—A serviceable Single Period Cold-pack canning outfit may be made of equipment found in almost any household. Any utensil large and deep enough to allow an inch of water above jars, and having a closely fitting cover, may be used for sterilizing. A wash-boiler, large lard can or new garbage pail serves the purpose when canning is to be done in large quantities. Into this utensil should be placed a wire or wooden rack to hold the jars off the bottom and to permit circulation of water underneath the jars. For lifting glass top jars use two buttonhooks or similar device. For lifting screw-top jars, suitable lifters may be bought for a small sum. A milk carrier makes a good false bottom, and if this is used the jars may be easily lifted out at the end of the sterilization period.

Commercial Hot-water Bath Outfits.—These are especially desirable if one has considerable quantities of vegetables or fruits to put up. They are convenient for out-door work, having firebox and smoke-pipe all in

one piece with the sterilizing vat. As with the homemade outfit containers are immersed in boiling water.

Water Seal Outfits.—These are desirable, as the period of sterilization is shorter than in the homemade outfit and less fuel is therefore required. The outfit consists of two containers, one fitting within the other, and a cover which extends into the space between the outer and the inner container. The waterjacket makes it possible for the temperature in the inner container to be raised above 212° F.

Steam Pressure Outfits.—Canning is very rapid when sterilization is done in steam maintained at a pressure. There are several canners of this type. Each is provided with pressure gauge and safety valve and they carry from 5 to 30 pounds of steam pressure. This type is suitable for home or community canning.

Aluminum Pressure Outfits.—These cookers are satisfactory for canning and for general cooking. Each outfit is provided with a steam pressure gauge and safety valve.

CONTAINERS

For home use glass jars are more satisfactory for canning than tin. This is especially true this year when there is a shortage of tin cans. Tin cans are used chiefly for canning on a large scale for commercial purposes. Glass jars properly cared for will last for years. All types of jars which seal readily may be used. Jars having glass tops held in place by bails are especially easy to handle while they are hot.

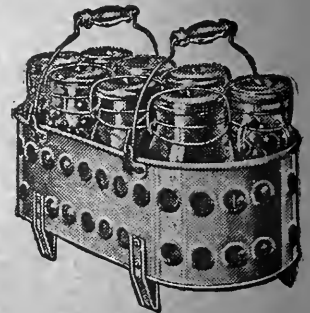


FIG. 8. Rack for jars.

Tops for Economy jars must be purchased new each year.

Containers made of white glass should be used if the product is to be offered for sale or exhibition, as blue glass detracts from the appearance of the contents.

Small necked bottles can be used for holding fruit juices. Large mouthed bottles can be used for jams, marmalades and jellies.



Fig. 9. Table arranged conveniently with various articles needed for canning by the Cold-pack method. The picture shows jars, rubbers, knife for removing air bubbles in containers, spoons, jar lifter, wire basket for blanching, knife for paring and coring, book of directions, towels, pan for cold-dipping, alarm clock and salt.

TESTS FOR JARS AND RUBBERS

Jars should be tested before they are used. Some of the important tests are here given:

Glass-top Jars.—Fit top to jar. If top rocks when tapped it should not be used on that jar. The top bail should not be too tight nor too loose. If either too tight or too loose the bail should be taken off and bent until it goes into place with a light snap. All sharp edges on top and jar should be filed or scraped off.

Screw-top Jars.—Use only enameled, lacquered or vulcanized tops. Screw the top on tightly without the rubber. If thumb nail can be inserted between top and jar, the top is defective. If the edge is only slightly uneven it can be bent so that it is usable. Put on the rubber and screw on the top tightly, and then pull the rubber out. If the rubber returns to place the top does not fit properly and should not be used on that jar.

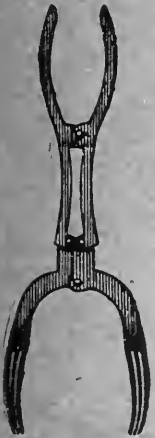


Fig. 10. A jar-lifter is useful.

Rubbers.—Be very particular about the rubbers used. Buy new rubbers every year as they deteriorate from one season to another. It is always well to test rubbers when buying. A good rubber will return to its original size when stretched. When pinched it does not crease (Fig. 11). It should fit the neck of the jar snugly, and be fairly wide and thick. It is cheaper to discard a doubtful rubber than to lose a jar of canned goods.

GRADING

Vegetables and fruits should be sorted according to color, size and ripeness. This is called grading. It insures the best pack and uniformity of flavor and texture to the canned product, which is always desirable.

BLANCHING AND COLD-DIPPING

The most important steps in canning are the preliminary steps of blanching, cold-dipping, packing in hot, clean containers, adding hot water at once, then immediately half sealing jars and putting into the sterilizer. Spoilage of products is nearly always due to carelessness in one of these steps. Blanching is necessary with all vegetables and many fruits. It insures thorough cleansing and removes objectionable odors and flavors and excess acids. It reduces the bulk of greens and causes shrinkage of fruits, increasing the quantity which may be packed in a container, which saves storage space.



Fig. 11. A simple method for testing rubber rings for jars. Fold the ring and press tightly and then turn it over and reverse the fold in the same place. A perfect rubber for Cold-pack canning will show no crease or break after this has been repeated two or three times.

Blanching consists of plunging the vegetables or fruits into boiling water for a short time. For doing this place them in a wire basket (Fig. 13) or piece of cheesecloth (Fig. 14). The blanching time varies from one to fifteen minutes, as shown in the time-table on page 2.

Spinach and other greens should not be blanched in hot water. They must be blanched in steam. To do this place them in a colander and set this into a vessel which has a tightly fitting cover. In this vessel there should be an inch or two of water, but the water must not be allowed to touch the greens (Fig. 25). Another method is to suspend the greens in the closed vessel above an inch or



FIG. 12



FIG. 13



FIG. 14

In the pictures on this and the next page are shown successive steps in canning by the Single Period Cold-pack Method. Fig. 12 shows paring and coring with sharp knife. Fig. 13 shows blanching with wire basket. Fig. 14 shows blanching with cheese cloth. (Continued at top of opposite page.)

two of water. This may be done in a wire basket or in cheesecloth. Allow the water to boil in the closed vessel from fifteen to twenty minutes.

When the blanching is complete remove the vegetables or fruits from the boiling water or steam and plunge them once or twice into cold water. Do not allow them to stand in the cold water. This latter process is the Cold Dip. It hardens the pulp and sets the coloring matter in the product.

ESSENTIALS FOR CANNING

It is important to plan your work so that whatever may be needed will be ready for use. Arrange everything conveniently in advance. Preliminary provisions include:

1. A reliable alarm clock in a convenient place (set to ring when the sterilizing is done).

2. All the necessary equipment in place before beginning work.

3. Jars, tops and rubbers carefully tested.

4. Fresh, sound fruits and vegetables.

5. Reliable instructions carefully followed.

6. Absolute cleanliness.

7: If working alone prepare only enough vegetables or fruits to fill the number of jars that the sterilizer will hold. Always blanch and cold-dip only enough product to fill one or two jars at the time. As soon as the jar is filled and the rubber and top bail adjusted the jar must be put into the hot-water bath.

8. In using the hot-water bath outfit, count the time of sterilization from the time water begins to boil. The water in the sterilizer should be at or just below the boiling point when jars are put in. With the Water Seal Outfit begin counting time when the thermometer reaches 214° F. With the Steam Pressure Outfit begin counting time when the gauge reaches the number of pounds called for in directions.



FIG. 18



FIG. 19



FIG. 20

After partially sealing jars place them in hot-water bath. Fig. 18 shows jars on rack being placed in ordinary household wash boiler for sterilizing. Fig. 19 shows the adjustment of cover, with cloth to give tighter fit and make it hold the steam. Fig. 20 shows the jar after removal. (Continued at bottom of next page.)



FIG. 15



FIG. 16



FIG. 17

After blanching, as shown in Figs. 13 and 14 vegetables and fruits are cold-dipped, as shown in Fig. 15. In Fig. 16 is shown the process of filling jar, by use of funnel. Fig. 17 shows the partial sealing of jar. With bail-top jar adjust top bail only; with screw top jar screw top on lightly. (Continued at bottom of opposite page.)

STEPS IN THE SINGLE PERIOD COLD-PACK METHOD

In canning by the Single Period Cold-pack method it is important that careful attention be given to each detail. Do not undertake canning until you have familiarized yourself with the various steps, which are as follows:

1. Vegetables should be canned as soon as possible after being picked; the same day is best. Early morning is the best time for gathering them. Fruits should be as fresh as possible.

2. Before starting work have on the stove the boiler or other holder in which the sterilizing is to be done, a pan of boiling water for use in filling jars of vegetables; or, if canning fruits, the syrup to be used in filling the jars. Arrange on this working table all necessary equipment, including instructions. (Fig. 9.)

3. Test jars and tops. All jars, rubbers and tops should be clean and hot.

4. Wash and grade product according to size and ripeness. (Cauliflower should be soaked 1 hour in salted water, to remove insects if any are present. Put berries into a colander and wash, by allowing cold water to flow over them, to prevent bruising.)

5. Prepare vegetable or fruit. Remove all but an inch of the tops from beets, parsnips and carrots and the strings from green beans. Pare squash, remove seeds and cut in small pieces. Large vegetables should be cut into pieces to make close pack possible. The pits should be removed from cherries, peaches and apricots.

6. Blanch in boiling water or steam as directed.

7. Cold-dip, but do not allow product to stand in cold water at this or any other stage.

8. Pack in hot jars which rest on hot cloths or stand in a pan of hot water. Fill the jars to within $\frac{1}{4}$ to $\frac{1}{2}$ inch of tops. (In canning berries, to insure a close pack, put a 2 or 3



FIG. 21



FIG. 22



FIG. 23

After removal from hot-water bath the jars are inverted to test for leakage (Fig. 21) and left inverted until they are cooled. They should be cooled rapidly but protected from draft. Fig. 22 shows wrapping jar in brown paper to exclude light. Fig. 23 shows storage on shelves. If the shelves are exposed to light, do not neglect wrapping.

inch layer of berries on the bottom of the jar and press down gently with a wooden spoon. Continue in this manner with other layers until jar is filled. Fruits cut in half should be arranged with pit surface down).

9. Add salt and boiling water to vegetables to cover them. To fruits add hot syrup or water.



FIG. 24. To the left is a bail-top jar partially sealed and ready for sterilization. The top bail is snapped into place and the lower bail left free. To the right is shown the way to complete the seal. The jar is now ready for storing.

10. Place wet rubber and top on jar.

11. With bail-top jar adjust top bail only, leaving lower bail or snap free. With screw top jar screw the top on lightly, using only the thumb and little finger. (This partial sealing makes it possible for steam generated within the jar to escape, and prevents breakage.)

12. Place the jars on rack in boiler or other sterilizer. If the home-made or commercial hot-water bath outfit is used enough water should be in the boiler to come at least one inch above the tops of the jars, and the water, in boiling out, should never be allowed to drop to the level of these tops. In using the hot-water bath outfit, begin to count sterilizing time when the water begins to boil. Water is at the boiling point when it is jumping or rolling all over. Water is not boiling when bubbles merely form on the bottom or when they begin to rise to the top. The water must be kept boiling all during the period of sterilization.

13. Consult time-table on page 2 and at the end of the required sterilizing period remove the jars from the sterilizer. Place them on a wooden rack or on several thicknesses of cloth to prevent breakage. Complete the sealing of jars. With bail-top jars this is done by pushing the snap down (Fig. 24); with screw top jars by screwing cover on tightly.

14. Turn the jars upside down as a test for leakage and leave them in this position till cold. Let them cool rapidly but be sure that

CAUTION AGAINST FREEZING

From a number of sources it has been learned that the severe weather of last winter caused considerable loss through the freezing of canned goods. To prevent similar trouble, care should be taken to store canned vegetables and fruits where they will be protected from freezing. If the place of storage is not frost-proof the jars should be moved to a warmer place when the weather becomes severe.

no draft reaches them as a draft will cause breakage. (If there is any doubt that a bail-top jar is perfectly sealed a simple test may be made by loosening the top bail and lifting the jar by taking hold of the top with the fingers. (Fig. 26.) The internal suction should hold the top tightly in place when thus lifted. If the top comes off put on a new wet rubber and sterilize 15 minutes longer for vegetables and 5 minutes longer for fruits.) With screw-top jars try the tops while the jars are cooling, or as soon as they have cooled, and, if loose, tighten them by screwing on more closely.

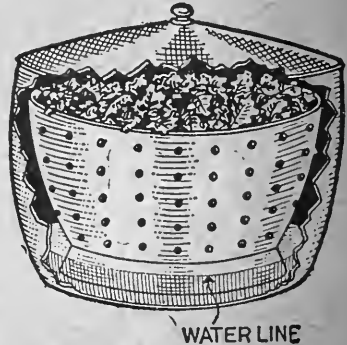


FIG. 25. Greens should not be blanched in hot water. They should be blanched in steam. This picture shows a simple method of blanching in steam, by placing them in a colander in a receptacle with tightly fitting cover. There should be not more than an inch or so of water on the bottom of the receptacle and the water should not touch the greens. A Steam Pressure Canner is excellent for use in blanching greens.

15. Wash and dry each jar, label and store.¹ If storage place is exposed to light, wrap each jar in paper, preferably brown, as light will fade the color of products canned in glass. The boxes in which jars were bought affords a good storage place.

A WORD OF CAUTION

It must not be forgotten that success in canning demands careful attention to every detail. No step should be slighted. Follow one set of instructions closely and do not attempt to combine two, no matter how good both of them may be. To attempt to follow two sets will inevitably cause spoilage.

With a vast army of new home canners at work in 1917 some failures were inevitable. These should not discourage home canners for the season of 1918. On the other hand the mistakes of last year should prove useful in preventing similar mistakes this year.

The experience of the United States Department of Agriculture during the last five years indicates that 75 per cent of the spoilage was due to the use of poor rubbers, the use of old tops on screw-top jars, and improper sealing resulting from the use of defective joints, springs and caps. Another fruitful source of trouble is that people sometimes undertake to can stale or wilted vegetables. Careless handling is also sure to cause loss. Absolute cleanliness in every step is essential.

In sterilizing care must be exercised to see that the temperature is high enough and maintained for the proper length of time.

**IN OTHER WORDS DO NOT BLAME THE METHOD FOR FAILURE.
FOLLOW DIRECTIONS CAREFULLY AND PREVENT FAILURE.**

SPECIAL INSTRUCTIONS FOR CANNING VEGETABLES

The addition of 1 level teaspoonful of salt to a jar of vegetables is for quart jars. For pint jar use 1/2 teaspoonful. For 2 quart jar use 2 teaspoonfuls.

Asparagus

Wash, scrape off scales and tough skin. With a string bind together enough for one jar. Blanch tough ends from 5 to 10 minutes, then turn so that the entire bundle is blanched 5 minutes longer. Cold-dip. Remove string. Pack, with tip ends up. Add 1 teaspoonful of salt and cover with boiling water. Put on rubber top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool. With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Beets

Use only small ones. Wash and cut off all but an inch or two of root and leaves. Blanch 5 minutes, cold-dip and scrape off skin and stems. They may be packed in jar sliced or whole. Add 1 teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Cabbage and Brussels Sprouts

The method is the same as for cauliflower, except that the vegetables are not soaked in salted water. Blanch 5 to 10 minutes. Sterilize 120 minutes in hot-water bath.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Carrots

Select small, tender carrots. Leave an inch or two of stems wash, blanch 5 minutes and cold-dip. Then remove skin and stems. Pack whole or in slices, add 1 teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Cauliflower

Wash and divide head into small pieces. Soak in salted water 1 hour, which will remove insects if any are present. Blanch 3 minutes, cold-dip and pack in jar. Add 1 teaspoonful of salt and cover with boiling water. Put on rubber and top



FIG. 26. A simple test for proper sealing of bail top jars is to loosen the top bail and lift the jar by taking hold of the top with the fingers. See Step No. 14, page 10.

and adjust top bail or screw top on with thumb and little finger. Sterilize 60 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 30 minutes at 5 to 10 pounds pressure.

Corn

Canning corn on the cob, except for exhibition purposes, is a waste of space. For home use remove the husks and silk, blanch tender ears 5 minutes, older ears 10 minutes, cold-dip, and cut from cob. Pack lightly to within $\frac{1}{2}$ inch of the top of the jar, as corn swells during sterilization. Add 1 teaspoonful of salt and cover with boiling water, put on rubber and top, adjust top bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 90 minutes at 5 to 10 pounds pressure.

Greens

Wash until no dirt can be felt in the bottom of the pan. Blanch in steam 15 minutes. (Mineral matter is lost if blanched in water). Cold-dip, cut in small pieces and pack or pack whole. Do not pack too tightly. Add 1 teaspoonful of salt to each jar and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Lima Beans

Shell. Blanch 5 to 10 minutes. Cold-dip, pack in jar, add 1 teaspoonful of salt and cover with boiling water. Put on rubber and top, and adjust top bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Okra

Wash and remove stems. Blanch 5 to 10 minutes, cold-dip and pack in jar. Add 1 teaspoonful of salt and cover with boiling water. Put on rubber and top, adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Parsnips

The method is the same as for carrots.

Peas

Those which are not fully grown are best for canning. Shell, blanch 5 to 10 minutes

and cold-dip. Pack in jar, add 1 teaspoonful of salt and cover with boiling water. If the jar is packed too full some of the peas will break and give a cloudy appearance to the liquid. Put on rubber and top and adjust top-bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Peppers

Wash, stem and remove seeds. Blanch 5 to 10 minutes, cold-dip and pack in jar. Add 1 teaspoonful of salt. Cover with boiling water, put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Pumpkin, Winter Squash

Remove seed. Cut the pumpkin or squash into strips. Peel and remove stringy center. Slice into small pieces and boil until thick. Pack in jar and sterilize 120 minutes in hot-water bath.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Salsify

Wash, blanch 5 minutes, cold-dip and scrape off skin. It may be packed whole or in slices. Add 1 teaspoonful of salt, and cover with boiling water. Put on top and rubber and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

String Beans

Wash and remove ends and strings and cut into small pieces if desired. Blanch from 5 to 10 minutes, depending on age. Cold-dip, pack immediately in jar, add 1 teaspoonful salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Summer Squash

Pare, cut in slices or small pieces and blanch 10 minutes. Cold-dip, pack in jars, add 1 teaspoonful of salt, cover with boiling water, put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

A WORD AS TO BOTULISM

During the canning season of 1917 widespread attention was attracted by the statement that vegetables canned by the Single Period Cold-pack Method had caused cases of poisoning technically known as botulism. It was declared that the *bacillus botulinus*, which produces botulism, was a menace to all users of vegetables canned by this method. Such statements were obviously circulated by those seeking to discourage American food thrift. Expert research workers of the National War Garden Commission and the United States Department of Agriculture agree that there is no danger of botulism from eating vegetables which have been canned by carefully following the directions issued by the Commission or the Department. **CARE MUST BE TAKEN, HOWEVER, TO FOLLOW DIRECTIONS EXPLICITLY.** Cooking canned vegetables for 10 minutes at the boiling point, after opening the jar for use, will remove any possible danger. This applies also to Apricots and Pears.

Tomatoes

Take medium sized tomatoes. Wash them, blanch until skins are loose, cold-dip and remove the skins. Pack whole in jar, filling the spaces with tomato pulp made by cooking large and broken tomatoes until done and then straining and adding 1 teaspoonful of salt to each quart of the pulp. Put on rubber and top and adjust top bail or screw top on

with thumb and little finger. Sterilize 22 minutes in hot-water bath. Remove, complete seal and cool. With Steam Pressure Outfit sterilize 15 minutes at 5 to 10 pounds pressure.

Tomatoes may be cut in pieces, packed closely into jars and sterilized 25 minutes in hot-water bath. If this is done do not add any liquid.

THE CANNING OF FRUITS

For fruits, as well as for vegetables, the Single Period Cold-pack method is best. With some exceptions, as shown in the table on page 2, fruits should be blanched before canning. When fruits are intended for table use, syrup should be poured over them to fill the jars. In canning fruits to be used for pie-filling or in cooking, where unsweetened fruits are desirable, boiling water is used instead of syrup. When boiling water is thus used the sterilization period in hot-water bath is thirty minutes.

SYRUPS

In the directions given various grades of syrup are mentioned. These syrups are made as follows:

Thin—1 part sugar to 4 parts water.

Medium—1 part sugar to 2 parts water.

Thick—1 part sugar to 1 part water

Boil the sugar and water until all the sugar is dissolved.

Use thin syrup with sweet fruits. Use medium syrup with sour fruits. Thick syrup is used in candying and preserving.

SPECIAL INSTRUCTIONS FOR CANNING FRUITS

Apples

Wash, pare, quarter or slice and drop into weak salt water. Blanch $1\frac{1}{2}$ minutes, cold-dip, pack into jar and cover with water or thin syrup. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize for 20 minutes in hot-water bath.

With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.

Apples shrink during sterilization and for this reason economy of space is obtained by canning them in the form of sauce instead of in quarters or slices. In canning sauce fill the jars with the hot sauce and sterilize 12 minutes in hot-water bath.

Apricots

Use only ripe fruit. Blanch 1 to 2 minutes. Wash, cut in half and remove pit. Pack in

PROLONG THE SEASON

The season for home canning and drying does not end with summer or early autumn. Many things may be canned or dried in October and November. Among these are turnips, spinach, squash, pumpkin, carrots, parsnips, cabbage, celery, beets, late corn, kale, chard, salsify, squash and tomatoes.

jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove, complete seal, cool and store.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Blackberries

Wash, pack closely and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Blueberries
Currants

Loganberries
Raspberries

The method is the same as for blackberries. Sterilize 16 minutes in hot-water bath.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Cherries

Cherries should be pitted before being canned. Pack in jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Pears

Peel and drop into salt water to prevent discoloration. Blanch $1\frac{1}{2}$ minutes. Pack in jar, whole or in quarters, and cover with thin syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 20 minutes in hot-water bath. Remove, complete seal and cool. A slice of lemon may be added to the contents of each jar for flavor.

With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.

Peaches

Blanch in boiling water long enough to loosen skins. Cold-dip and remove skins. Cut in half and remove stones. Pack in jar and cover with thin syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16

minutes in hot-water bath. Remove, complete seal and cool.

Some peaches do not peel readily even if dipped in boiling water. In such cases omit dipping in boiling water and pare them.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Plums

Wash, pack in jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Pineapples

Pare, remove eyes, shred or cut into slices or small pieces, blanch 3 to 5 minutes, and pack in jar. Cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 30 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Quinces

The method is the same as for apples. They may be canned with apples. Sterilize 20 minutes in hot-water bath.

With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.

Rhubarb

Wash and cut into short lengths. Cover with boiling water or thin syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 20 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 15 minutes at 5 to 10 pounds pressure.

Strawberries

Wash and pack closely in jar. Cover with medium syrup, put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

PRINCIPLES OF JELLY MAKING

To be satisfactory, jelly must be made from fruit juice containing pectin and acid. Pectin is a substance in the fruit which is soluble in hot water and which, when cooked with sugar and acid, gives, after cooling, the right consistency to jelly.

Fruits to be used should be sound, just ripe or slightly under-ripe, and gathered but a

short time. Wash them, remove stems and cut large fruits into pieces. With juicy fruits add just enough water to prevent burning while cooking. In using fruits which are not juicy cover them with water. Cook slowly until the fruits are soft. Strain through a bag made of flannel or two thicknesses of cheesecloth or similar material.

TEST FOR PECTIN

To determine if the juice contains pectin, boil 1 tablespoonful and cool. To this add 1 tablespoonful of grain alcohol and mix, gently rotating the glass. Allow the mixture to cool. If a solid mass—which is pectin—collects, this indicates that in making jelly one part of sugar should be used to one part of juice. If the pectin collects in two or three masses, use $\frac{2}{3}$ to $\frac{3}{4}$ as much sugar as juice. If it collects in several small particles use $\frac{1}{2}$ as much sugar as juice. If the presence of pectin is not shown as described it should be supplied by the addition of the juice of slightly under-ripe fruits, such as apples, currants, crab-apples, green grapes, green gooseberries or wild cherries.

Measure the juice and sugar. The sugar may be spread on a platter and heated. Do not let it scorch. When the juice begins to boil add the sugar. Boil rapidly. The jelly point is reached when the juice drops as one mass from the side of a spoon or when two drops run together and fall as one from the side of the spoon. Skim the juice, pour into sterilized glasses and cool as quickly as possible. Currant and green grape require 8 to 10 minutes boiling to reach the jelly point while all other juices require from 20 to 30 minutes.

When the jelly is cold pour over the surface a layer of hot paraffin. A toothpick run around the edge while the paraffin is still hot will give a better seal. Protect the paraffin with a cover of metal or paper.

Three or more extractions of juice may be made from fruit. When the first extraction is well drained cover the pulp with water and let it simmer 30 minutes. Drain, and test juice for pectin. For the third extraction proceed in the same manner. The juice resulting from the second and third extractions may be combined. If the third extraction shows much pectin a fourth extraction may be made. The first pectin test should

be saved for comparison with the others.

If the second, third or fourth extraction of juice is found thinner than the first extraction, boil it until it is as thick as the first; then add the sugar called for.



FIG. 27. Simple device for straining fruit juices for jelly making.

JELLY MAKING WITHOUT TEST

The test for pectin is desirable, but it is not essential. In some states it is inconvenient because of the difficulty of obtaining grain alcohol. A large percentage of housewives make jelly without this test, and satisfactory results may be obtained without it if care is taken to follow directions and to use the right fruits. For the inexperienced jelly maker the safe rule is to confine jelly-making to the fruits which are ideal for the

purpose. These include currants, sour apples, crab-apples, under-ripe grapes, quinces, raspberries, black-berries, blue-berries, wild cherries, and green gooseberries. These contain pectin and acid in sufficient quantities.

In making jelly without the alcohol test, with the juice of currants and under-ripe grapes use 1 cup of sugar to 1 cup of juice. With raspberries, blackberries, blueberries, sour apples, crab-apples, quinces, wild cherries and green gooseberries use $\frac{3}{4}$ cup of sugar to 1 cup of juice. This applies to the first extraction of juice and to the later extractions when they have been boiled to the consistency of the first extraction.

Fruits which contain pectin but lack sufficient acid are peach, pear, quince, sweet apple and guava. With these acid may be added by the use of juice of crab apples or under-ripe grapes.

Strawberries and cherries have acidity but lack pectin. The pectin may be supplied by the addition of the juice of crab apples or under-ripe grapes.

DIRECTIONS FOR JELLY MAKING

Wash, remove stems, and with the larger fruits cut into quarters. Put into a saucepan and cover with water. Allow to simmer until

the fruit is tender. Put into a bag to drain. If desired, test juice for pectin as described. Measure juice and sugar in proportions indicated by the test for pectin or as directed under "Jelly Making without Test." Add the sugar when the juice begins to boil. The sugar may be heated before being added. When the boiling juice reaches the jelly point as shown on page 15, skim and pour into sterilized glasses.

WINTER JELLY MAKING

Fruit juices may be canned and made into jelly as wanted during the winter. Allow 1 cup of sugar to 6 cups of juice. Boil juice and sugar for 5 minutes. Pour into sterilized bottles or jars. Put into hot-water bath, with

the water reaching to the neck of the containers. Allow to simmer 20 to 30 minutes. If jars are used half seal them during the simmering. Put absorbent cotton into the necks of bottles and when the bottles are taken from the bath put in corks, forcing the cotton into the neck. Corks should first be boiled and dried to prevent shrinking. They may also be boiled in paraffin to make them airtight. After corking the bottles apply melted paraffin to the tops with a brush, to make an airtight seal. Each bottle should be labeled and the label should specify the amount of sugar used. In making jelly from these juices during the winter follow the "Directions for Jelly Making," adding enough sugar to give the amount called for.

FRUIT BUTTERS

Fruit butters may be made from good sound fruits or the sound portions of fruits which are wormy or have been bruised. Wash, pare and remove seeds if there are any. Cover with water and cook 3 or 4 hours at a low temperature, stirring often, until the mixture is of the consistency of thick apple sauce. Add sugar to taste when the boiling is two-thirds done. Spices may be added to suit the taste when the boiling is completed. If the pulp is coarse it should be put through a wire sieve or colander. Pour the butter into sterilized jar, put on rubber and cover and adjust top bail. Put into a container having a cover and false bottom. Pour in an inch or so of water and sterilize quart jar or smaller jar 5 minutes after the steam begins to escape. Remove, push snap in place and cool

Apple Butter with Cider

Four quarts of sweet or sterilized cider should be boiled down to 2 quarts. To this add 4 quarts of apples peeled and cut in small pieces. If the texture of the apples is coarse they should be boiled and put through a strainer before being added to the cider. Boil this mixture until the cider does not separate from the pulp. When two-thirds done add one pound of sugar. One-half teaspoonful each of cinnamon, allspice and cloves may be added. Pour into sterilized jars and sterilize 5 minutes in steam.

Apple and pear butter may be made by following the directions for apple butter with cider but omitting the cider.

Peach Butter

Dip peaches in boiling water long enough to loosen the skins. Dip in cold water peel and stone them. Mash and cook them without adding any water. Add half as much sugar as pulp and cook until thick. Pour into sterilized jars and sterilize 5 minutes in steam.

Plum butter may be made following the directions for peach butter.

Apple Butter with Grape Juice

To every 4 quarts of strained apple sauce add 1 pint of grape juice, 1 cup of brown sugar and $\frac{1}{4}$ teaspoonful of salt. Cook slowly, stirring often, until of the desired thickness. When done stir in 1 teaspoonful of cinnamon, pack in hot jars and sterilize 5 minutes in steam.

Dried Peach Butter

Soak dried peaches over night. Cook slowly until tender. To each 2 pounds of dried peaches add 1 quart of canned peaches and $1\frac{3}{4}$ pounds of sugar. If a fine texture is desired, strain pulp through a colander. Cook slowly, stirring often, until thick. Pack in hot jars and sterilize 5 minutes in steam.

PART II

HOME DRYING MANUAL

Drying vegetables and fruits for winter use is one of the vital national needs of wartime. As a national need it becomes a patriotic duty. As a patriotic duty it should be done in every family.

Failure to prepare vegetables and fruits for winter use by Drying is one of the worst examples of American extravagance. During the summer nature provides an over-abundance. This year, with the planting of 5,000,000 home food gardens, stimulated by the National War Garden Commission and the United States Department of Agriculture, this abundance will be especially large. The excess supply is not meant to go to waste. The over-abundance of the summer should be made the normal supply of the winter. The individual family should conduct Drying on a liberal scale. In no other way can there be assurance that America's food supply will meet our own needs. In no other way, surely, can we answer the enormous demands made upon us for furnishing food for our European Allies.

IMPORTANCE OF FOOD THRIFT

Winter buying of vegetables and fruits is costly. It means that you pay transportation, cold-storage and commission merchants' charges and profits. Summer is the time of lowest prices. Summer, therefore, is the time to buy for winter use.

Every pound of food products grown this year will be needed to combat Food Famine. The loss that can be prevented, the money saving that can be effected and the transportation relief that can be brought about make it essential that every American household should make vegetable and fruit Drying a part of its program of Food Thrift. The results can be gained in no other way:

Vegetable and fruit drying have been little practiced for a generation or more. Its revival on a general scale is the purpose of this Manual. There is no desire to detract from the importance of canning operations. Drying must not be regarded as taking the place of the preservation of vegetables and fruits in tins and glass jars. It must be viewed as an important adjunct thereto. Drying is important and economical

in every home, whether on the farm, in the village, in the town, or in the city. For city dwellers it has the special advantage that little storage space is required for the dried fruit. One hundred pounds of some fresh vegetables will reduce to 10 pounds in drying without loss of food value or much of the flavor.

This year's need for vegetable and fruit Drying is given added emphasis by the shortage of tin for the manufacture of cans. This condition has created an unusual demand for glass jars. For this year, therefore, Drying is of more than normal importance. Dried products can be stored in receptacles that could not be used for canning.

DRYING IS SIMPLE

A strong point in connection with vegetable and fruit Drying is the ease with which it may be done. Practically all vegetables and fruits may be dried. The process is simple. The cost is slight. In every home the necessary outfit, in its simplest form, is already at hand. Effective Drying may be



FIG. 1. Carrots cut lengthwise for drying.

done on plates or dishes placed in the oven, with the oven door partially open. It may be done on the back of the kitchen stove, with these same utensils, while the oven is being used for baking. It may also be done on sheets of paper or lengths of muslin spread in the sun and protected from insects and dust.

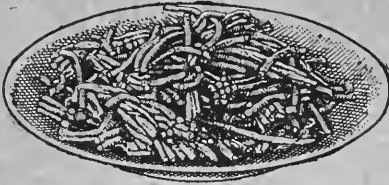


FIG. 2. One form of preparing potatoes for drying. This is done by the use of the meat chopper shown in Fig. 16.

Apparatus for home Drying on a larger scale may be made at home or bought at small cost. Still larger equipment may be bought for community drying operations in which a group of families combine for co-operative work, at a school or other convenient center. This latter is especially recommended as making possible the use of the most improved outfits at slight cost to the individual family. See "Community Work," page 3.

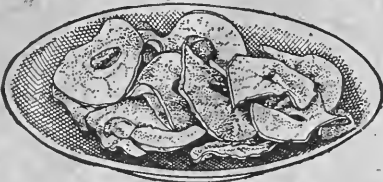


FIG. 3. Apples peeled and sliced for drying.

METHODS OF DRYING

For home Drying satisfactory results are obtained by any one of three principal methods. These are:

1. Sun Drying.
2. Drying by Artificial Heat.
3. Drying by Air-blast. (With an electric fan.)

These methods may be combined to good advantage.

SUN DRYING

Sun Drying has the double advantage of requiring no expense for fuel and of freedom from danger of overheating. For sun Drying of vegetables and fruits the simplest form

is to spread the slices or pieces on sheets of plain paper or lengths of muslin and expose them to the sun. Muslin is to be preferred if there is danger of sticking. Trays may be used instead of paper or muslin. Sun Drying requires bright, hot days and a breeze. Once or twice a day the product should be turned or stirred and the dry pieces taken out. The drying product should be covered with cheesecloth tacked to a frame for protection from dust and flying insects. If trays are rested on supports placed in pans of water the products will be protected from crawling insects. Care must be taken to provide protection from rain, dew and moths. During rains and just before sunset the products should be taken indoors for the purpose of protection.

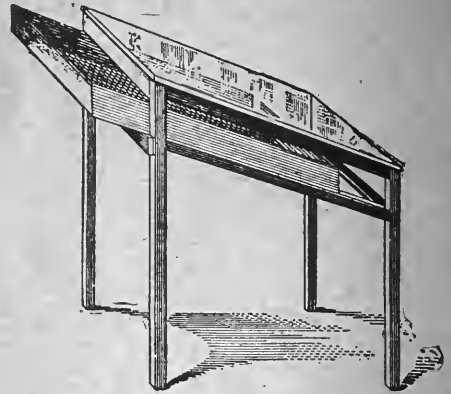


FIG. 4. Small outdoor drier, easily made at home. It has glass top, sloping for best exposure to sun. The tray is shown partly projecting, to indicate construction. Protect openings around tray with cheesecloth, as explained on pages 18 and 19.

TRAYS FOR SUN DRYING

To make a tray cheaply for use in sun-drying, take strips of lumber three-quarters of an inch thick and 2 inches wide for the sides and ends. To form the bottom, laths should be nailed to these strips, with spaces of one-eighth of an inch between laths to permit air circulation. A length of 4 feet, corresponding to the standard lengths of laths, is economical. Instead of the laths galvanized wire screen, with openings of one-eighth or one-quarter of an inch may be used. In using wire, the size of the tray should be regulated by the width of wire screen obtainable. The trays should be of uniform size in order that they may be stacked together for convenience in handling.

A small home-made Sun Drier, easily constructed (Fig. 4), is made of light strips

of wood, a sheet of glass, a small amount of galvanized wire screen and some cheesecloth. A convenient size for the glass top is 18 by 24 inches. To hold the glass make a light wooden frame of strips of wood $\frac{1}{2}$ inch thick and 1 inch wide. This frame should have legs of material 1 by $1\frac{1}{2}$ inches, with a length of 12 inches for the front legs and 18 inches for those in the rear. This will cause the top to slope, which aids in circulation of air and gives direct exposure to the rays of the sun. As a tray support, nail a strip of wood to the legs on each of the four sides, about 4 inches below the top framework and sloping parallel with the top. The tray is made of thin strips of wood about 2 inches wide and has a galvanized wire screen bottom. There will be a space of about 2 inches between the top edges of the tray and the glass top of the

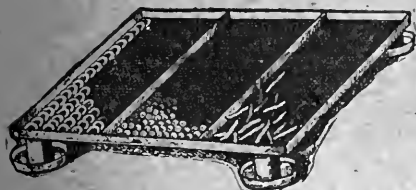


FIG. 5. Simple tray for sun drying. It is made of wire mesh with light framework and rests on bricks placed in pans of water. This arrangement protects the material from creeping insects.

Drier, to allow for circulation. Protect both sides, the bottom and the front end of the Drier with cheesecloth tacked on securely and snugly, to exclude insects and dust without interfering with circulation. At the rear end place a cheesecloth curtain tacked at the top but swinging free below, to allow the tray to be moved in and out. Brace the bottom of this curtain with a thin strip of wood, as is done in window shades. This curtain is to be fastened to the legs by buttons when the tray is in place.

DRYING BY ARTIFICIAL HEAT

Drying by artificial heat is done in the oven or on top of a cookstove or range, in trays suspended over the stove or in a specially constructed drier built at home or purchased.

OVEN DRYING

The simplest form of Oven Drying is to place small quantities of foodstuffs on plates in a slow oven. In this way leftovers and other bits of food may be saved for winter use with slight trouble and dried while the

top of the stove is being used. This is especially effective for sweet corn. A few sweet potatoes, apples or peas, or even a single turnip, may be dried and saved. To keep the heat from being too great leave the

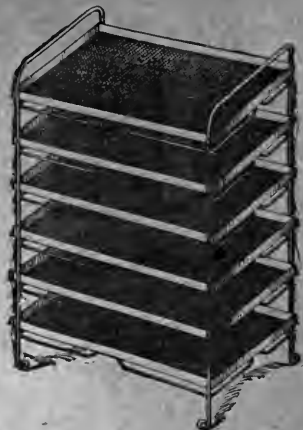


FIG. 6. Commercial drier for use in oven of stove or range, after removal of grates from oven. This requires less fuel than is used in cooking. With five trays 11 inches long and 10 inches wide this costs \$5. With trays 14 by 16 it costs \$6.

oven door partially open. For oven use a simple tray may be made of galvanized wire screen of convenient size, with the edges bent up for an inch or two on each side. At each corner this tray should have a leg an inch or two in length, to hold it up from the bottom of the oven and permit circulation of air around the product.

An oven drier which can be bought at a low price is shown in Fig. 6.

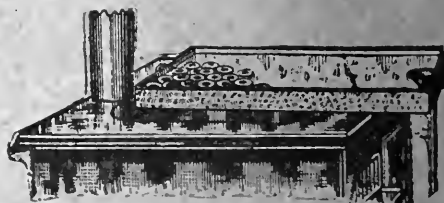


FIG. 7. Commercial drier costing \$6 to \$12, placed on top of cookstove and supported at one end by a leg reaching the floor. This drier may be suspended over a lamp.

DRYING ON TOP OF OR OVER STOVE OR RANGE

An effective Drier for use over a stove or range may be made easily at home. Such a Drier is shown in Fig. 10. For the frame use strips of wood $\frac{1}{2}$ -inch thick and 2 inches wide. The trays or shelves are made of

galvanized wire screen of small mesh tacked to the supports; or separate trays sliding on strips attached to the framework are desirable. This Drier may be suspended from the ceiling over the kitchen stove or range or over an oil, gasoline, or gas stove, and it

may be used while cooking is being done. If an oil stove is used there must be a tightly fitting tin or galvanized iron bottom to the Drier, to prevent the fumes of the oil from reaching and passing through the material which is to be dried. A bottom of this kind may be easily attached to any Drier, either

home made or commercial. A frame-

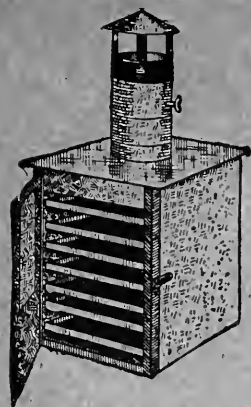


FIG. 8. Commercial drier for use on top of stove.

work crane as shown in Fig. 10 makes it possible for this Drier to be swung to one side when not in use.

In Fig. 9 is shown another form of Home-made Cookstove Drier, more pretentious than that shown in Fig. 10, but still easily and cheaply made. A good size for this is: base, 16 by 24 inches; height, 36 inches. The lower part or supporting framework, 6 inches high, is made of galvanized sheet iron, slightly flaring toward the bottom, and with two ventilating holes in each of the four sides. The frame which rests on this base, is made of strips of wood 1 or 1½ inches wide. Wooden strips, 1¼ inches wide, and 3 inches apart, serve to brace the sides and furnish supports for the trays.

In a Drier of the dimensions given there is room for eight trays. The sides, top and back are of galvanized iron or tin sheets, tacked to the framework, although thin strips of wood may be used instead of the metal. Small hinges and thumbblatch are provided for the door. Galvanized sheet iron, with numerous small holes in it, is used for making the bottom of the Drier. To prevent direct heat from coming in contact with the product, and also to distribute the heat by radiation, a piece of galvanized sheet iron is placed 2 inches above the bottom. This piece is 3 inches shorter and 3

inches narrower than the bottom and rests on two wires fastened to the sides.

The trays are made of wooden frames of 1-inch strips, to which is tacked galvanized wire screen. Each tray should be 3 inches shorter than the Drier and enough narrower to allow it to slide easily on the supports in being put in or taken out.

In placing the trays in the Drier push the lower one back as far as it will go, leaving a 3-inch space in front. Place the next tray even with the front, leaving the space at the back. Alternate all the trays in this way, to facilitate the circulation of the heated air. It is well to have a ventilating opening, 6 by 2 inches, in the top of the Drier to discharge moisture. The trays should be shifted during the drying process, to procure uniformity of drying.

One of the simplest forms of home-made Drier is a tray with bottom of galvanized wire screen, suspended over stove or range, as shown in Fig. 14.

Commercial Driers

Cookstove Driers are in the market in several types. One of these, shown in Fig. 8, has a series of trays in a framework, forming a compartment. This is placed on

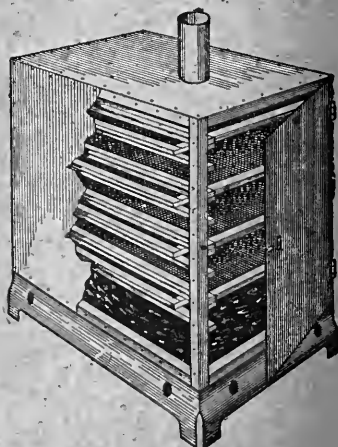


FIG. 9. Homemade drier to be set on top of stove or range. It is made of galvanized iron. Described on page 20.

top of the stove. A similar drier is shown in Fig. 11. Another, shown in Fig. 7, is a shallow metal box to be filled with water, and so constructed that one end may rest on the back of the stove and the other on a leg reaching to the floor, or it may be suspended over a lamp.

Commercial Driers, having their own furnaces may be bought at prices ranging from \$24 to \$120. This type is pictured in Fig. 12. Some of these, in the smaller sizes, may be bought without furnaces, and used on the top of the kitchen stove, as Fig. 8. The cost is from \$16 upwards.

AIR BLAST-ELECTRIC FAN

The use of an electric fan is an effective means of Drying. Fig. 13 shows how this household article is used. Sliced vegetables or fruits are placed on trays 1 foot wide and 3 feet long. These trays are stacked and the fan placed close to one end, with the current directed along the trays, lengthwise. The number of trays to be used is regulated by the size of the fan. Drying by this process may be done in twenty-four hours or less. With sliced string beans and shredded sweet potatoes a few hours are sufficient, if the air is dry.

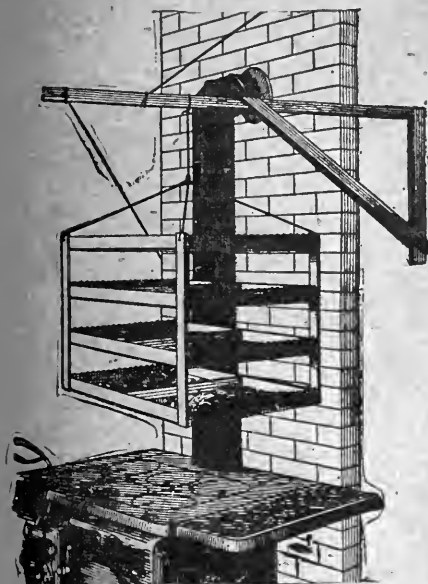


FIG. 10. Homemade drier suspended from swinging crane over cookstove. Described on pages 19 and 20.

SOME OF THE DETAILS OF DRYING

As a general rule vegetables or fruits, for Drying, must be cut into slices or shreds, with the skin removed. In using artificial heat be careful to start at a comparatively low temperature and gradually increase. Details as to the proper scale of temperatures

for various vegetables and fruits are given in the directions in this Manual and in the time table on page 27. To be able to gauge the heat accurately a thermometer must be used. An oven thermometer may be bought at slight cost. If the thermometer is placed in a glass of salad oil the true temperature of the oven may be obtained.

In the detailed instructions on pages 24, 25 and 26, the temperatures used are Fahrenheit. The time and temperatures indicated are for Drying by artificial heat.

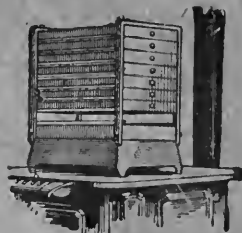


FIG. 11. Another type of commercial drier for use on top of stove. Its cost is \$6.

The actual time required for Drying cannot be given, and the person in charge must exercise judgment on this point. A little experience will make it easy to determine when products are sufficiently dried. When first taken from the Drier vegetables should be rather brittle but not so dry as to snap or crackle, and fruits rather leathery and pliable. One method of determining whether fruit is dry enough is to squeeze a handful, if the fruit separates when the hand is opened, it is dry enough. Another way is to press a single piece; if no moisture comes to the surface the piece is sufficiently dry. Berries are dry enough if they stick to the hand but do not crush when squeezed.

Raspberries, particularly, should not be dried too hard, as this will keep them from resuming their natural shape when soaked in water for use. Material will mold if not dried enough.

PREPARING FOOD MATERIAL FOR DRYING

A sharp kitchen knife will serve every purpose in slicing and cutting vegetables and fruits for Drying, if no other device is at hand. The thickness of the slices should be from an eighth to a quarter of an inch. Whether sliced or cut into strips the pieces should be small so as to dry quickly. They should not, however, be so small as to make them hard to handle or to keep them from being used to advantage in preparing dishes for the table such as would be prepared from fresh products.

Food choppers, kraut slicers or rotary slicers may be used to prepare food for drying.

Vegetables and fruits for Drying should be fresh, young and tender. As a general

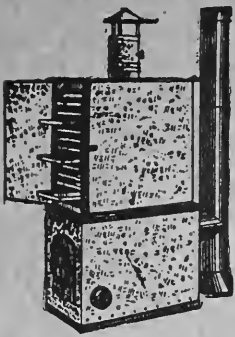


FIG. 12. One type of commercial drier with furnace.

rule vegetables will dry better if cut into small pieces with the skins removed. Berries are dried whole. Apples, quinces, peaches and pears dry better if cut into rings or quarters. Cleanliness is imperative. Knives and slicing devices must be carefully

cleansed before and after use. A knife that is not bright and clean will discolor the product on which it is used and this should be avoided.

BLANCHING AND COLD-DIPPING

Blanching is desirable for successful vegetable Drying. Blanching gives more thorough cleansing, removes objectionable odors and flavors, and softens and loosens the fiber, allowing quicker and more uniform evaporation of the moisture, and gives better color. It is done by placing the vegetables in a piece of cheesecloth, a wire basket or other porous container and plunging them into boiling water. The time required for this is short

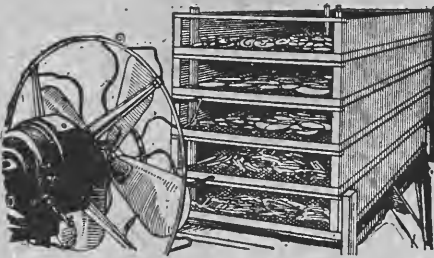


FIG. 13. Series of trays with ends facing electric fan, for drying by air blast.

and varies with different vegetables. For the proper time in each case consult the directions given for Drying on pages 24, 25 and 26 and the time table on page 27. Blanching should be followed by the cold-dip, which means plunging the vegetables into cold water for an instant after removing from the boiling water. Cold-dipping hardens the pulp

and sets the coloring matter. After blanching and dipping, the surface moisture may be removed by placing the vegetables between two towels.

DANGER FROM INSECTS

In addition to exercising great care to protect vegetables and fruits from insects during the Drying process, precautions should be taken with the finished product to prevent the hatching of eggs that may have been deposited. One measure that is useful is to subject the dried material to a heat of 160° F. for from 5 to 10 minutes before storing it away. By the application of this heat the eggs will be killed. Be careful not to apply heat long enough to damage the product.

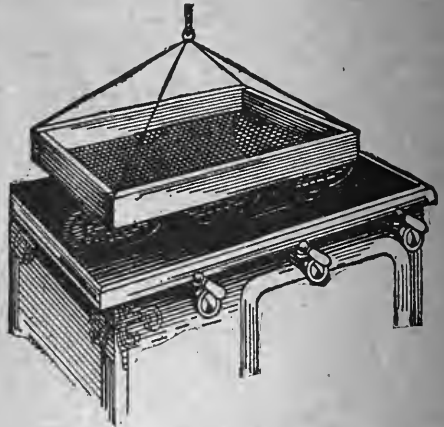


FIG. 14. Simple drier made at home. This is merely a tray hung over cookstove.

CONDITION BEFORE STORING

It is important to "condition" Dried Products before storing them for the winter. This means that they should be placed in boxes and poured from one box to another once a day for three or four days to mix thoroughly. If any part of the material is then found to be too moist, return to Drier for a short Drying. **PRACTICALLY ALL DRIED PRODUCTS SHOULD BE CONDITIONED.**

STORAGE FOR DRIED PRODUCTS

Of importance equal to proper Drying is the proper packing and storage of the finished product. With the scarcity of tins and the high prices of glass jars it is recommended that other containers be used. Those easily available are baking powder cans and similar

covered tins; paste-board boxes having tight-fitting covers, strong paper bags, and patented paraffin paper boxes, which may be bought in quantities at comparatively low cost.

A paraffin container of the type used by oyster dealers for the delivery of oysters will be found inexpensive and easily handled. If using this, or a baking powder can or similar container, after filling adjust the cover closely. The cover should then be sealed. To do



FIG. 15. Preparing dried products for storing. Various types of containers are here shown, together with melted paraffin and brush for sealing.

this paste a strip of paper around the top of the can, covering the joint between can and cover, for the purpose of excluding air. Paste-board boxes should also be sealed in this way. Paraffin containers should be sealed by applying melted paraffin with a brush to the joint.

If a paper bag is used, the top should be twisted, doubled over and tied with a string. Moisture may be kept out of paper bags by coating them, using a brush dipped into melted paraffin. Another good precaution is to store bags within an ordinary lard pail or can or other tin vessel having a closely fitting cover.

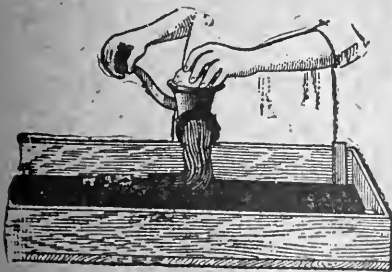


FIG. 16. Meat chopper used for preparing vegetables.

The products should be stored in a cool, dry place, well ventilated and protected from rats, mice and insects. In sections where the air is very moist, moisture-proof containers must be used. It is good practice to use small containers so that it may not be necessary to leave the contents exposed long after opening and before using.

For convenience label all packages.

WINTER USE OF DRIED PRODUCTS

In preparing dried vegetables and fruits for use the first process is to restore the water which has been dried out of them. All dried foods require long soaking. After soaking the dried products will have a better flavor if cooked in a covered utensil at a low temperature for a long time. Dried products should be prepared and served as fresh products are prepared and served. They should be cooked in the water in which they have been soaked, as this utilizes all of the mineral salts, which would otherwise be wasted.

There can be no definite rule for the amount of water required for soaking dried products when they are to be used, as the quantity of water evaporated in the drying process varies with different vegetables and fruits. As a general rule from 3 to 4 cups of water will be required for 1 cup of dried material.

In preparing for use, peas, beans, spinach and like vegetables should be boiled in water to which there has been added soda in the proportion of $\frac{1}{8}$ teaspoonful of soda to 1 quart of water. This improves the color of the product.

In preparing to serve dried vegetables season them carefully. For this purpose celery, mustard, onion, cheese and nutmeg give desirable flavoring, according to taste.

From 3 to 4 quarts of vegetable soup may be made from 4 oz. of dried soup vegetables.

DIRECTIONS FOR VEGETABLE DRYING

Asparagus

The edible portion should be blanched from 3 to 5 minutes, cold dipped, the stalks slit lengthwise into two strips if of small or medium size or into four strips if of large size. Drying time, 4 to 8 hours. Start at temperature of 110° F. and raise gradually to 140°.

The hard ends of the stalk, which are not edible, should be dried for soup stock. Blanch 10 minutes, cold dip, slice into 2 to 6 pieces, according to size, and dry as described above.

Brussels Sprouts

The drying process is the same as with cauliflower, with the addition of a pinch of soda to the blanching water.

Beets

Boil whole until more than three-fourths cooked, without removing skin. After dipping in cold water, peel and cut into $\frac{1}{8}$ to $\frac{1}{4}$ inch slices. Drying time, two and one-half to three hours. Start at temperature of 110° F. and raise gradually to 150°.

Beet Tops and Swiss Chard

Select tops of young beets or Swiss chard suitable for greens. Wash carefully, cut leaf-stalk and blade into pieces $\frac{1}{4}$ of an inch long, spread on screens and dry.

Cabbage

Take heads that are well developed. Remove all loose outside leaves. Shred or cut into strips a few inches long. Cut the core crosswise several times, and shred it for drying with the rest of the cabbage. Blanch 10 minutes, cold-dip, drain, remove surface moisture. Drying time, 3 hours. Start at temperature of 110° F. and raise gradually to 145°.

Carrots and Parsnips

Clean thoroughly and remove outer skin, preferably with a stiff bristle brush; or the skin may be removed by paring or scraping. Slice into thickness of $\frac{1}{8}$ of an inch. Blanch 6 minutes, cold dip and remove surface moisture. Drying time, 2 $\frac{1}{2}$ to 3 hours. Start at temperature of 110° F. and raise gradually to 150°.

Kohl-rabi, Celeriac and Salsify are dried in the same way as Carrots and Parsnips.

Cauliflower

After cleaning, divide into small pieces. Blanch six minutes and cold dip. Drying time, three to three and one-half hours. Start at temperature of 110° F. and raise to 145°. Although turning dark while drying, Cauliflower will regain part of original color in soaking and cooking. Dried Cauliflower is specially good for soups and omelets.

Celery

After washing carefully cut into 1-inch pieces, blanch three minutes, cold-dip and remove surface moisture. Dry slowly. Drying time, three to four hours. Start at temperature of 110° F. and raise to 140°.

Garden Peas

Garden peas with non-edible pod are taken when of size suitable for table use. Blanch 3 to 5 minutes, cold-dip, remove surface moisture and spread in single layers on trays. Drying time, 3 to 3 $\frac{1}{2}$ hours. Start at temperature of 110° F., raising slowly, in about 1 or 1 $\frac{1}{2}$ hours, to 145°, and then continue 1 and 1 $\frac{1}{2}$ to 2 hours at 145°.

For use in soups or puree, shell mature peas, pass them through a meat grinder, spread the pulp on trays and dry.

With young and tender sugar peas use the pod also. After washing, cut into $\frac{1}{4}$ -inch pieces. Blanch 6 minutes, cold-dip, and remove surface moisture. Drying time, 3 to 3 $\frac{1}{2}$ hours. Start at temperature of 110° F. and raise gradually to 145°.

Green String Beans

Select only such beans as are in perfect condition for table use. Wash carefully and string. If full grown they should be slit lengthwise or cut—not snapped—into pieces $\frac{1}{4}$ to 1 inch long. If young and tender, dry them whole. Blanch 6 to 10 minutes. To set color add one-half teaspoonful of soda to each gallon of boiling water. After blanching, dip quickly into cold water, then drain

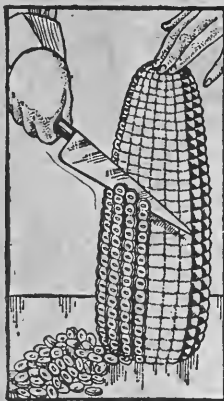


FIG. 17. Slicing corn from cob for drying.

FIRE PREVENTION

In home drying care should be taken that danger from fire does not result. Driers made wholly or partly of wood should not be exposed to heat in such way that the woodwork might catch fire if accidentally overheated or left alone too long. DO NOT USE WOOD ON TOP OF A STOVE.

thoroughly to remove surface moisture. Drying time for young beans, two hours; for those more mature, three hours. Start at temperature of 110° F. and raise gradually to 145°.

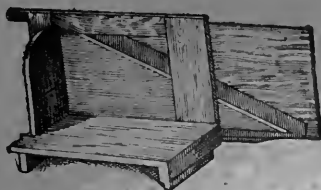


FIG. 18. Kraut slicer, for use in preparing vegetables for drying.

Greens and Herbs

After washing carefully and removing leaves, slice, and dry in sun or by artificial heat, following directions for cabbage. If steam is not easily available, dry without blanching or cold dipping.

These directions apply to spinach, kale, dandelions and parsley.

Celery tops, mint, sage and herbs of all kinds for flavoring are treated in the same way.

Lima Beans

If lima beans are gathered when young and tender, shell them, wash, and then blanch 5 to 10 minutes, the time varying with maturity and size. Cold-dip. Remove surface moisture. Drying time, 3- to 3½ hours. Start at temperature of 110° F. and raise gradually to 145°.



FIG. 19. Vegetable and fruit slicer.

Okra

After washing, blanch three minutes in boiling water with one-half teaspoonful of soda to each gallon. Cold dip. With young and tender pods dry whole; cut older pods into ¼-inch slices. Drying time, two to three hours. Start at temperature of 110° F. and raise gradually to 140°.

Okra may also be dried by being strung on a string and hung over the stove. This should not be done except with young and tender pods. Heat in oven before storing.

Onions and Leeks

After washing, peeling and cutting into ¼ to ½-inch slices for onions, and ¼-inch strips for leeks, blanch in boiling water or steam for 5 minutes, cold-dip and remove surface moisture. Drying time, 2½ to 3 hours. Start at temperature of 110° F. and raise gradually to 140°.

Peppers

Steam until skin softens; or place in biscuit pan in oven and heat until skin blisters. Peel, split in half, take out seed. Start drying at temperature of 110° F. and gradually increase to 140°. Thick fleshed peppers, such as

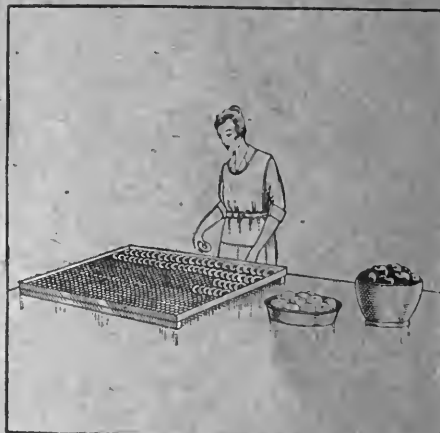


FIG. 20. Arranging vegetables or fruits on trays for drying.

pimientos, must be dried very slowly and evenly. Small varieties of red peppers may be spread in the sun until wilted and the drying finished in a drier, or they may be entirely dried in the sun.

Another plan for drying peppers is to split them on one side, remove seed, start with air drying and finish in a drier at 140°.

Pumpkin and Summer Squash

Cut into ½-inch strips and pare. Blanch three minutes. Cold dip, remove surface moisture and dry slowly. Drying time, three to four hours. Start at temperature of 110° F. and raise to 140°. The strips may be hung on strings and dried in the kitchen above the stove.

Rhubarb

Slit the larger stems lengthwise, cut into ½ to ¾-inch lengths. Do not use the leaf. Blanch three minutes and cold dip. Dry thoroughly. Start at temperature of 110° F. and raise gradually to 140°.

Soup Mixtures

Vegetables for soup mixtures are prepared and dried separately. These are mixed as desired.

Sweet Corn

Select ears that are young and tender and freshly gathered. Blanch on cob in steam or boiling water—preferably steam—for 5 to 10 minutes to set milk. If boiling water is used, add a teaspoonful of salt to each gallon. Cold dip, drain thoroughly, and with a sharp knife cut off in layers or cut off half the kernel and scrape off the remainder, taking care not to include the chaff. Drying time, 3 to 4 hours. Start at temperature of 110° F. and raise gradually to 145°.

In using field corn it should be taken at the roasting-ear period of ripeness, and the ears should be plump.

To prepare for sun-drying, corn may first be dried in the oven for 10 or 15 minutes. After sun-drying is completed the corn

should again be heated in oven to 145° F. to kill possible insect eggs.

Sweet Potatoes

Wash, boil until almost cooked, peel, slice or run through meat chopper, spread on trays and dry until brittle. Sliced sweet potatoes may be dried without boiling. If this is done, dipping in cold water just before drying will brighten color.

Tomatoes

Blanch long enough to loosen skin, cold dip, peel, slice to thickness of $\frac{1}{8}$ of an inch. Start at temperature of 110° F. and gradually raise to 145°, continuing until thoroughly dried: Another method is, after peeling, to cut crosswise in center, sprinkle with sugar and dry at temperature as above until the finished product resembles dried figs.

Wax Beans

These are dried in the same manner as green string beans.

DIRECTIONS FOR FRUIT DRYING

Fruits may be dried in the sun until the surface begins to wrinkle, then finished in the drier. With stone fruits, such as peaches, plums, apricots and cherries, none but fruits that are fresh, ripe and in perfect condition should be used. With apples, pears and quinces, effective thrift calls for using the sound portions of fruit that may be partially wormy or imperfect. When properly dried, fruits should be entirely free from moisture when pressed between the fingers on removal from drier. Line trays with cheesecloth or wrapping paper before spreading fruit on them.

Berries

Pick over, removing all leaves and stems, wash, if necessary, and remove surface moisture, handling with care to prevent bruising. Spread in thin layers and dry slowly. The total drying time is four to five hours. Start at temperature of 110° F., raising to 125° in about two hours. Then raise temperature to 140° and maintain two to three hours longer.

Cherries

After washing and removing surface moisture, spread unpitted in thin layers. Drying time two to four hours. Start at

temperature of 110° F., and raise gradually to 150°. If preferred, the pits may be removed, although this causes loss of juice.

Plums and Apricots

Select fruits which are ripe. Remove pits by cutting fruit open with a sharp knife. Arrange halves on trays. Start drying at temperature of 110° F. and raise gradually to 145°. These fruits are usually dried with skins on.

Apples, Pears and Quinces

Pare, core and slice, dropping slices into cold water containing eight teaspoonfuls of salt to the gallon, if a light-colored product is desired. Leaving them a minute or two in the salt water will prevent discoloration. (If preferred, core the whole fruit, after peeling, and slice into rings, dipping these for a minute or two into cold salted water as described above.) Remove surface moisture. Drying time 4 to 6 hours, or until leathery and pliable. Start at temperature of 110° F. and raise gradually to 150°. Pears may be steamed ten minutes after slicing and before drying. Quinces are treated in the same way as pears.

Peaches

Dip peaches into boiling water long enough to loosen skins. Then dip in cold water and peel. Cut into halves or quarters, remove stones and dry as directed for apples.

Vegetables should be dried as soon as possible after they are picked and should be young, tender, sound and perfectly cleaned. Drying soon after being picked is almost as important with fruits as with vegetables.

Occasionally examine stored dried products. Upon the first appearance of insects spread the material in thin layer on trays and expose to heat until it is free from the insects; then store as at first.

TIME TABLE FOR BLANCHING AND DRYING

The following time-table shows blanching time for vegetables and the approximate time required for drying vegetables and fruits, with temperatures to be used in drying by artificial heat. Cold-dip after blanching.

Vegetables	Blanching time	Approximate Drying time	Temperature (Fahrenheit)
	<i>Minutes</i>	<i>Hours</i>	<i>Degrees</i>
Asparagus.....	5 to 10	4 to 8	110 to 140
Beets.....	Till skin cracks	2½ to 3	110 to 150
Brussels sprouts.....	6	3 to 3½	110 to 145
Cabbage.....	10	3	110 to 145
Carrots.....	6	2½ to 3	110 to 150
Cauliflower.....	6	3 to 3½	110 to 145
Celery.....	3	3 to 4	110 to 140
Garden peas.....	3 to 5	3 to 3½	110 to 145
Green string beans.....	6 to 10	2 to 3	110 to 145
Kohl-rabi, celeriac and salsify.....	6	2½ to 3	110 to 150
Leeks.....	5	2½ to 3	110 to 140
Lima beans (young).....	5 to 10	3 to 3½	110 to 145
Okra.....	3	2 to 3	110 to 140
Onions.....	5	2½ to 3	110 to 140
Parsnips.....	6	2½ to 3	110 to 150
Peppers.....			110 to 140
Pumpkin.....	3	3 to 4	110 to 140
Rhubarb.....	3		110 to 145
Spinach, parsley and other herbs.....		3	110 to 145
Summer squash.....	3	3 to 4	110 to 140
Sugar peas.....	6	3 to 3½	110 to 145
Sweet corn.....	5 to 10	3 to 4	110 to 145
Swiss chard.....	3	3 to 4	110 to 140
Tomatoes.....	To loosen skin		110 to 145
Wax beans.....	6 to 10	2 to 3	110 to 145
Fruits			
Apples.....		4 to 6	110 to 150
Apricots.....		4 to 6	110 to 150
Berries.....		4 to 5	110 to 140
Cherries.....		2 to 4	110 to 150
Peaches.....		4 to 6	110 to 150
Pears.....		4 to 6	110 to 150
Plums.....		4 to 6	110 to 150
Quinces.....		4 to 6	110 to 150

Follow instructions on pages 22, 24, 25 and 26, as to cold-dipping after blanching.

The exact time for Drying cannot be given. The time given in the above table is only approximate. Individual judgment must be used following the directions in "Some of the Details of Drying," on page 21.

YOUR QUESTIONS WILL BE ANSWERED

This Commission maintains a Department of Household Science which will welcome questions connected with War Vegetable Gardening, Home Canning, Home Drying and kindred subjects. Technically trained workers, of practical experience, will give prompt attention to all inquiries. Address Department of Household Science, National War Garden Commission, Maryland Building, Washington, D. C.

FERMENTATION AND SALTING

The use of brine in preparing vegetables for winter use has much to commend it to the household. The fermentation method is in general use in Europe, and is becoming better known in this country as a means of making sauerkraut and other food products which do not require the containers used for canning. No cooking is required by this process. Salt brine is the one requirement. The product may be kept in any container that is not made of metal and is water-tight. The vital factor in preserving the material is the lactic acid which develops in fermentation. An important feature is that vegetables thus prepared may be served as they are or they may be freshened by soaking in clear water and cooked as fresh vegetables.

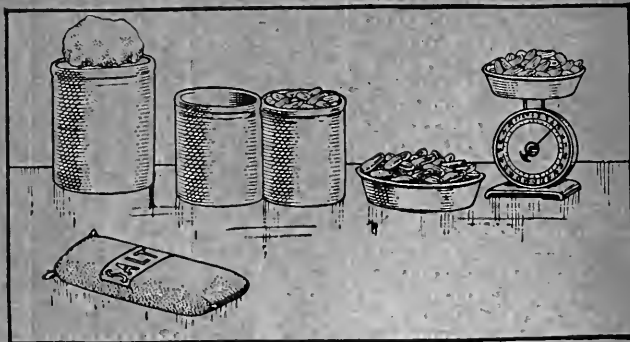


FIG. 21. Articles used in fermenting vegetables.

Sauerkraut

The outside leaves of the cabbage should be removed, the core cut crosswise several times and shredded very finely with the rest of the cabbage. Either summer growth or fall cabbage may be used. Immediately pack into a barrel, keg or tub, which is perfectly clean, or into an earthenware crock holding four or five gallons. The smaller containers are recommended for household use. While packing distribute salt as uniformly as possible, using 1 pound of salt to 40 pounds of cabbage. Sprinkle a little salt in the container and put in a layer of 3 or 4 inches of shredded cabbage and then pack down with a wooden utensil like a potato masher. Repeat with salt, cabbage and packing until the container is full or the shredded cabbage is all used. Press the cabbage down as tightly as possible and apply a cloth and then a glazed plate or a board cover which will go inside the holder. If using a wooden cover select wood free from pitch, such as basswood. On top of this cover place stones or other weights (using flint or granite and avoiding

the use of limestone or sandstone). These weights serve to force the brine above the cover.

Allow fermentation to proceed for 10 days or two weeks, if the room is warm. In a cellar or other cool place three to five weeks may be required. Skim off the film which forms when fermentation starts and repeat this daily if necessary to keep this film from becoming scum. When gas bubbles cease to arise, if container is tapped, the fermentation is complete. If there is scum it should be removed. As a final step pour melted paraffin over the brine until it forms a layer from $\frac{1}{4}$ to $\frac{1}{2}$ inch thick to prevent the for-

mation of the scum which occurs if the weather is warm or the storage place is not well cooled. This is not necessary unless the kraut is to be kept a long time. The kraut may be used as soon as the bubbles cease to rise. If scum forms and remains the kraut will spoil. Remove scum, wash cloth cover and weights, pour off old brine and add new. To avoid this extra trouble it is wise to can the kraut as soon as bubbles cease to rise and fermentation is complete. (To can, fill jars, adjust rubbers and partly seal. Sterilize 120 minutes in Hot-water Bath or 60 minutes in Steam Pressure Outfit at 5 to 10 pounds pressure.)

SALTING WITHOUT FERMENTATION

Preserving cabbage, string beans and greens for winter use by salting is a method which has long been used. To do this the vegetables should be washed, drained and weighed. The amount of salt needed will be one-fourth of the weight of the vegetables. Kegs or crocks make satisfactory containers. Put a layer of vegetables about an inch thick on the bottom of the container. Cover this with salt. Continue making alternate layers of vegetables and salt until the container is almost filled. The salt should be evenly distributed so that it will not be necessary to

use more salt than the quantity required in proportion to the vegetables used. Cover the surface with a cloth and a board or glazed plate. Place a weight on these and set aside in a cool place. If sufficient liquor to cover the vegetables has not been extracted by the next day, pour in enough strong brine (1 pound of salt to 2 quarts of water) to cover surface around the cover. The top layer of vegetables should be kept under the brine to prevent molding. There will be some bubbling at first. As soon as this stops set the container where it will not be disturbed until ready for use. Seal by pouring very hot paraffin on the surface.

THE USE OF BRINE

This method is used for cucumbers, string beans, green tomatoes, beets, corn and peas, as these vegetables do not contain enough water for a good brine using only salt. Wash and put in a crock

or other container within 3 or 4 inches of the top. Pour over them a brine made by adding to every 4 quarts of water used ½ pint of vinegar and ¾ cup salt. The amount of brine needed will be about ½ the volume of the material to be fermented. When fermentation is complete the container should be sealed as with sauerkraut.

To Ferment Cucumbers

Unless the cucumbers are from your own garden wash them carefully to insure cleanliness after indiscriminate handling. Pack them in a keg, barrel or crock, leaving space at the top for the cover. Cover them with a brine made by adding to every 4 quarts of water used ½ pint of vinegar and ¾ cup of salt. The amount of brine needed will be one-half of the volume of the material to be fermented. Place a wooden cover or glazed plate on top of the contents and press it down by weighting it with a stone or other weight, to keep the cucumbers under the brine. Fermentation will require from 8 to 10 days in warm weather and from 2 to 4 weeks in cool weather. It is complete when bubbles cease to rise when the container is lightly tapped or

jarred. When this stage is reached remove any scum which may have collected, pour hot paraffin over the cover and around the weight and store in a cool place.

Green Tomatoes

The process for green tomatoes is the same as that for cucumbers.

Beets and String Beans

Remove the strings from beans. Beets should be washed thoroughly and packed whole. Spices may be used, as with cucumbers, but these may be omitted if the vegetables are to be refreshed by soaking, when they are to be used. The method is the same as with cucumbers.

PREPARING FOR USE

To prepare these vegetables for use the brine should be drained off and the vegetables soaked in clear cold water for several hours with one or two

changes of water. They may then be cooked as fresh vegetables, with at least one change of water while cooking.

With salted vegetables it may be necessary to change the water once or twice while boiling. This is a matter of taste. Fermented vegetables should be rinsed in fresh water after removing from the container. To retain the acid flavor do not soak in water before cooking.

If cooked without soaking, fermented dandelions, spinach, kale and other greens will have flavor similar to that of the greens in their fresh state.

Fermented corn should be soaked several hours, with three or four changes of water. During the cooking also there should be one change of water. The corn may then be used in chowder, pudding, omelet, fritters or waffles.

Salted string beans should be soaked to remove the salt and then prepared and served as fresh beans are prepared and served. Fermented string beans may be cooked without soaking and served as the fresh beans are served. Young and tender string beans may be eaten raw.

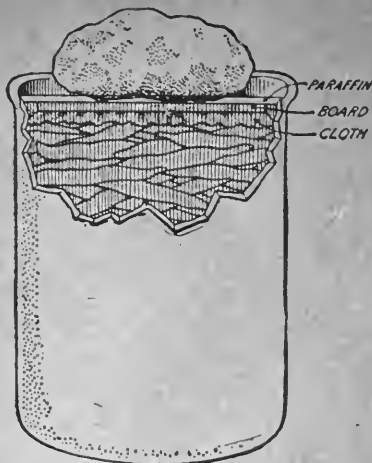


FIG. 22. Arrangement of cover on crock containing fermented products. Note the use of paraffin, board and cloth.

PICKLING VEGETABLES

Pickling is an important branch of home preparedness for the winter months. Pickles have little food value but they give a flavor to a meal which is liked by many. They should not be given to children.

In pickling, vegetables are usually soaked over night in a brine made of 1 cup of salt and 1 quart of water. This brine removes the water of the vegetable and so prevents weakening of the vinegar. In the morning the brine is drained off.

Alum should not be used to make the vegetables crisp as it is harmful to the human body. A firm product is obtained if the vegetables are not cooked too long or at too high a temperature.

Spices, unless confined in a bag, give a dark color to the pickles.

Enameled, agate or porcelain-lined kettles should be used when cooking mixtures containing vinegar.

Pickles put in crocks should be well covered with vinegar to prevent molding.

Instructions for some of the most commonly used methods are given herewith.

Catsup

- 2 quarts ripe tomatoes, boil and strain.
- Add 2 tablespoonfuls of salt.
- 2 cups of vinegar.
- $\frac{3}{4}$ cup of sugar.
- 1 teaspoonful of cayenne pepper.

Boil until thick. Pour into hot sterilized bottles. Put the corks in tightly and apply hot paraffin to the tops with a brush to make an airtight seal.

Chili Sauce

- 2 dozen ripe tomatoes.
- 6 peppers (3 to be hot).
- 3 onions.
- $\frac{1}{4}$ cup of sugar.
- 2 tablespoonfuls of salt.
- 1 teaspoonful each of cloves, nutmeg and allspice.
- 1 quart of vinegar.

Simmer 1 hour. Pour into sterilized jars or bottles and seal while hot.

Chow Chow

- 2 pint cucumbers. (1 pint to be small ones).
- 1 cauliflower soaked in salted water for one hour.
- 2 green peppers.
- 1 quart onions.

Chop the above in small pieces. Sprinkle 1 cup of salt over them and let stand all night. Drain well in the morning.

The sauce for Chow Chow is made as follows:

- 2 quarts vinegar.
- $\frac{1}{4}$ pound of mustard.
- 1 tablespoonful of turmeric.
- $\frac{2}{3}$ cup of sugar.
- $\frac{3}{4}$ cup of flour.

Make a paste of the mustard, turmeric, sugar, flour and a little vinegar. Stir this into the warm vinegar and boil until thick. Then add the vegetables and simmer $\frac{1}{2}$ hour. Stir to prevent burning. Put in cans while hot.

Cold Tomato Relish

8 quarts firm, ripe tomatoes; scald, cold-dip and then chop in small pieces.

To the chopped tomato add:

- 2 cups chopped onion.
- 2 cups chopped celery.
- 2 cups sugar.
- 1 cup white mustard seed.
- $\frac{1}{2}$ cup salt.
- 4 chopped peppers.
- 1 teaspoonful ground mace.
- 1 teaspoonful black pepper.
- 4 teaspoonfuls cinnamon.
- 3 pints vinegar.

Mix all together and pack in sterilized jars.

Corn Relish

- 1 small cabbage.
- 1 large onion.
- 6 ears of corn.
- 2 tablespoonfuls of salt.
- 2 tablespoonfuls of flour.
- $1\frac{1}{2}$ cups of brown sugar.
- 2 hot peppers.
- 1 pint of vinegar.
- $1\frac{1}{2}$ tablespoonfuls of mustard.

Steam corn 30 minutes. Cut from the cob and add to the chopped cabbage, onion and peppers. Mix the flour, sugar, mustard and salt—add the vinegar. Add mixture to the vegetables and simmer 30 minutes. Pour into sterilized jars or bottles and seal while hot.

Cucumber Pickles

Soak in brine made of 1 cup of salt to 2 quarts of water for a day and night. Remove from brine, rinse in cold water and drain. Cover with vinegar, add 1 tablespoonful brown sugar, some stick cinnamon, and cloves to every quart of vinegar used; bring to a boil and pack in jars. For sweet pickles use 1 cup of sugar to 1 quart of vinegar.

Green Tomato Pickle

Take 4 quarts of green tomatoes, 4 small onions and 4 green peppers. Slice the tomatoes and onions thin. Sprinkle over them $\frac{1}{2}$ cup of salt and leave overnight in crock or enameled vessel. The next morning drain off the brine. Into a separate vessel put 1 quart of vinegar, 1 level tablespoonful each of black pepper, mustard seed, celery seed, cloves, allspice and cinnamon and $\frac{3}{4}$ cup of sugar. Bring to a boil and then add the prepared tomatoes, onions and peppers. Let simmer for 20 minutes. Fill jars and seal while hot.

Green Tomato Pickle

Wash and slice tomatoes. Soak in a brine of $\frac{1}{4}$ cup of salt to 1 quart of water overnight. Drain well. Put in a crock and cover

with vinegar to which has been added stick cinnamon and 1 cup of sugar for every quart of vinegar used. Once a day for a week pour off vinegar, heat to boiling and pour over tomatoes again. Cover top of crock with a cloth and put on cover. This cloth should be frequently washed.

Mustard Pickles

- 2 quarts of green tomatoes.
- 1 cauliflower.
- 2 quarts of green peppers.
- 2 quarts of onions.

Wash, cut in small pieces and cover with 1 quart of water and 1/4 cup of salt. Let stand 1 hour, bring to the boiling point and drain. Mix 1/2 pound mustard, 1 cup of flour, 3 cups of sugar, and vinegar to make a thin paste. Add this paste to 2 quarts of vinegar and cook until thick, stir constantly to prevent burning. Add vegetables, boil 15 minutes and seal in jars.

Piccalilli

- 4 quarts of green tomatoes.
- 1 quart of onions.
- 1 hot red pepper.
- 1/2 pound of sugar.
- 1/2 cup of salt.
- 1 1/2 ounce each of mustard seed, cloves and allspice.
- 2 cups of vinegar.

Simmer 1 hour. Put into a covered crock

Pickled Onions

Peel, wash and put in brine using 2 cups of salt to 2 quarts water. Let stand 2 days, pour off brine. Cover with fresh brine and let

stand 2 days longer. Remove from brine wash and pack in jars, cover with hot vinegar to which whole cloves, cinnamon and allspice have been added.

Spiced Crab Apples

Wash, stick 3 or 4 whole cloves in each apple and cover with vinegar to which have been added stick cinnamon and 1 cup sugar for every quart of vinegar used. Cook slowly at a low temperature until apples are heated through. These may be put in jars or stone crocks.

Sweet Pickled Peaches

Wipe and stick 3 or 4 whole cloves in each peach. Put in jars or crock and cover with hot vinegar allowing 2 cups of sugar to each quart of vinegar used. Every morning for a week pour off the vinegar, heat to boiling and pour over peaches again. On the last day seal jars or cover crock well.

Table Relish

Chop:

- 4 quarts of cabbage.
- 2 quarts of tomatoes, 1 quart to be green.
- 6 large onions.
- 2 hot peppers.

Add:

- 2 ounces of white mustard seed
- 1 ounce of celery seed.
- 1/4 cup of salt.
- 2 pounds of sugar.
- 2 quarts of vinegar.

Simmer 1 hour. Pour into sterilized jars or bottles and seal while hot.

This manual was prepared by the Commission's experts and is based on their own research and experience, supplemented by information procured from the United States Department of Agriculture, from Agricultural Colleges and Experiment Stations and from other sources.

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