

CHAPTER XXV.

HOME METHODS OF FOOD PRESERVATION.

CANNING is more generally used in this country for preserving fruit and vegetables than drying. While one may purchase a large variety of canned foods, it is always well to be a little suspicious of those put up in tin or those in which pleasing coloring matters have been used to add attractiveness to the food in question.

While undoubtedly the pure food law has done much towards breaking up the practice of some dealers in adulterating canned goods and using harmful preservatives in them, it must not be forgotten that this law applies only to food shipped from one state to another and not in any way to foods made for sale in the state in which they are prepared. Hence, unless you are protected by a rigorous pure food law in your own state, you are as much as ever at the mercy of the wretches who adulterate and poison food under the false pretense of preserving it. Therefore it is just as well to avoid canned foods of unknown origin.

Dried foods, such as peas, beans and evaporated fruits, as a rule are better than similar foods preserved by canning, unless you are satisfied that these have been kept pure and clean during the canning process. At the same time there can be no question but that canned fruits and vegetables, if properly prepared, are a most useful addition to the everyday dietary. Those that are put up in glass are generally preferable to those put up in tin, though if, when the tin can is emptied its surface is smooth and bright, showing that no chemical nor acid has been eating away its substance, it is safe to assume that the contents are unharmed and harmless.

ADVICE TO CANNERS.—But by far the better plan, however is for the provident housewife to do the canning of the fruits and vegetables needed for her own household herself.

The process of canning is generally understood, but the government bulletins written by experts tell of improved

methods and gives some excellent hints from which I extract the following:—

“In canning fruits it is well to remember that the product is more satisfactory if heated gradually to the boiling point and then cooked the given time.

“The selection of fruit is one of the first steps in obtaining successful results. The flavor of fruit is not developed until it is fully ripe, but the time at which the fruit is at its best for canning, jelly-making, etc., is just before it is perfectly ripe. In all soft fruits the fermentative stage follows closely upon the perfectly ripe stage; therefore it is better to use under-ripe rather than over-ripe fruit. This is especially important in jelly-making for another reason also: In over-ripe fruit the pectin begins to lose its jelly-making quality.

“All fruit should, if possible, be freshly picked for preserving, canning and jelly-making. No imperfect fruit should be canned or preserved. Gnarly fruit may be used for jellies and marmalades by cutting out defective portions. Bruised spots should be cut out of peaches and pears, etc.

“When fruit is brought into the house put it where it will keep cool and crisp until you are ready to use it.

“The preparation of fruit for the various processes of preserving is the second important step. Begin by having the kitchen swept and dusted thoroughly, so that there will not be a large number of mold spores floating about. Dust with a damp cloth. Have plenty of hot water and pans in which jars and utensils may be sterilized. Have at hand all necessary utensils, towels, sugar, etc.

“If practicable, pare fruit with a silver knife, so as not to stain or darken the product. The quickest and easiest way to peel peaches is to drop them into boiling water for a few minutes. Have a deep kettle a little more than half full of boiling water; fill a wire basket with peaches; put a long handled spoon under the handle of the basket and lower into the boiling water. At the end of three minutes lift the basket out by slipping the spoon under the handle. Plunge the basket for a moment into a pan of cold water.

Let the peaches drain a minute and then peel. Plums and tomatoes may be peeled in the same manner.

“If peaches are to be canned in sirup, put them at once into the sterilized jars. They may be canned whole or in halves. If in halves, remove nearly all the stones or pits. For the sake of flavor, a few stones should be put in each jar.

“When jelly is to be made from any of the large fruits, wash clean and remove stem and blossom end. Nearly all of the large fruits are better for having the skins left on. Apples and pears need not be cored, but there is so much gummy substance in the core of quinces that it is best not to use this portion in making fine jelly.

“Canning fruits is from all points the most desirable method of preserving them for home use. It is the easiest and commonly considered the most economical and the best, because the fruit is kept in a soft and juicy condition in which it is believed to be easily digested. The wise housekeeper will can her principal fruit supply, making only enough rich preserves to serve for variety and for special occasions.

“In canning, any proportion of sugar may be used, or fruit may be canned without the addition of any sugar. However, that which is designed to be served as a sauce should have the sugar cooked with it. Fruit intended for cooking purposes need not have the sugar added to it.

“Juicy fruits, such as berries and cherries, require little or no water. Strawberries are better not to have water added to them. The only exception to this is when they are cooked in heavy sirup.”

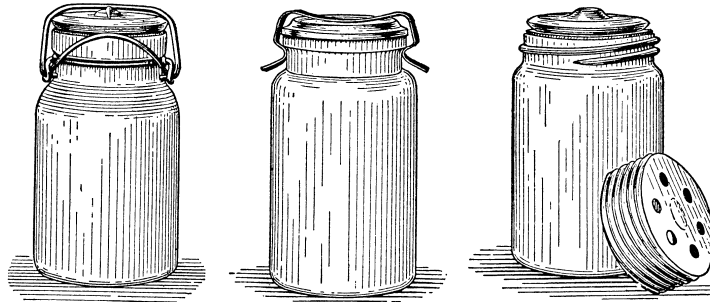
Canning Vegetables.—In the canning of vegetables also Mr. J. F. Breazeale, an expert of the Department of Agriculture, makes some important suggestions and shows, what many housewives have not learned, that, when one knows how to go to work properly, it is just as easy to can vegetables as fruit. He says:

“Bacteria thrive in products like milk and in meats and vegetables rich in protein, such as peas, beans, etc. They are so small that they can only be seen with a microscope, and they

reproduce themselves with amazing rapidity. One bacterium under favorable conditions will produce about twenty million in the course of twenty-four hours. Accordingly certain vegetables spoil more rapidly than others, because they furnish a better medium for bacterial growth.

“Certain species of bacteria will live and cause vegetables to decompose even when no air is present. Hence to guard against decay, the vegetable must first be thoroughly sterilized.

“Now the reproduction of bacteria is brought about by one of two processes. The germ either divides itself into two parts, making two bacteria where one existed before, or else reproduces itself by means of spores. These present the chief difficulty in canning vegetables. While the parent bacteria may be readily killed at the temperature of boiling water, the spores retain their vitality for a long time even at that temperature, and upon cooling will germinate, and the newly formed bacteria will begin their destructive work. Therefore it is necessary, in order completely to sterilize a vegetable, to heat it to the boiling point of water and keep it at that temperature for about one hour, upon two or three successive days, or else keep it at the temperature of boiling water for a long period of time—about five hours. The process of boiling upon successive days is the one that is always employed in scientific work and is much to be preferred. The boiling on the first



Type of jar used in canning. To open jar spring at side is first raised as shown.

Another type of jar with metal top and fastener.

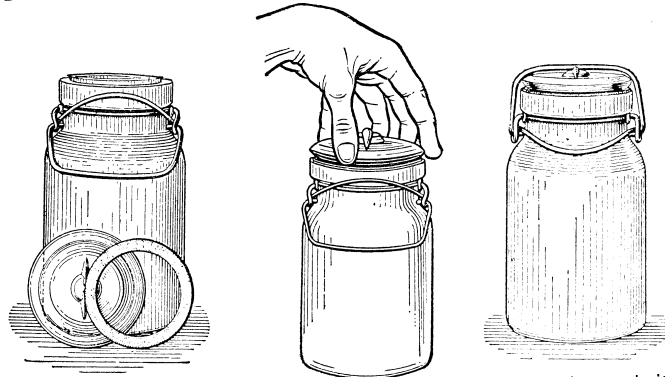
Type of improved screw-top jar, with glass top and metal screw cover.

day kills all the molds and practically all the bacteria, but does not kill the spores or seeds.

“As soon as the jar cools, these seeds germinate and a fresh crop of bacteria begin work upon the vegetables. The boiling point upon this second day kills this crop of bacteria before they have had time to develop spores. The boiling upon the third day is not always necessary, but is advisable in order to be sure that the sterilization is complete. Among scientists this is called fractional sterilization, and this principle constitutes the whole secret of canning. If the housewife will only bear this in mind she will be able with a little ingenuity to can any meat, fruit or vegetable.

“Never attempt to can any vegetable that has matured and commenced to harden or one that has begun to decay. As a rule, young vegetables are superior in flavor and texture to the more mature ones. This is especially true of string beans, okra and asparagus. Vegetables are better if gathered in the morning while the dew is still on them.”

DANGERS OF PRESERVING POWDERS.—For purposes of sterilization some people use “preserving powders.” These powders should never be used. It may be true that some of them are not particularly harmful, but their use may be dangerous and had far better be avoided. The sure, safe and



Spring-top canning jar showing rubber ring and glass cover.

Jar with springs released ready for removing cover.

Jar at the conclusion of the canning, tightly sealed and ready for storing.

proper way to sterilize is by means of heat, and as this can be done very easily and cheaply, the use of all preservatives in canning should be rigorously excluded. In vegetables, as in fruits, glass jars should always be used, if possible, and the wider the top the better.

The best utensil for canning is the steam-cooker, as here-with pictured. It is ideal for canning, holding a dozen or more quart jars. At the same time it is somewhat expensive and can be dispensed with. If one has a common ham- or clothes-boiler with a tight-fitting cover, it will answer every purpose if it is fitted with a false bottom made of wire netting. This netting is made of medium sized No. 16 galvanized wire, with one-half inch mesh. Narrow strips of wood can be put across the bottom of the boiler and the wire-netting false bot-tom allowed to rest upon these.

As soon as the vegetables are prepared pack each jar full,

add salt to taste, and then fill up the jar to the top with cold water. The rubber rings should always be placed on the top before the jars are filled. Then place the cover on top loosely so that the steam may have perfect oppor-tunity of egress dur-ing the process of cooking.

Now place the false bottom in the boiler and put in as many jars as the boiler will conveniently hold. Do not try to crowd them



Steam cooker with jars—a splendid device used in canning.

in. Leave space between them. Pour in about three inches of cold water or just enough to form steam and prevent the boiler from going dry during the cooking. It is not necessary to have the water up to the neck of the jars, as the steam will do the cooking. Put the cover on the boiler and set it on the stove. Bring the water to a boil and keep it boiling for one hour. At the end of that time remove the cover of the boiler and allow the steam to escape.

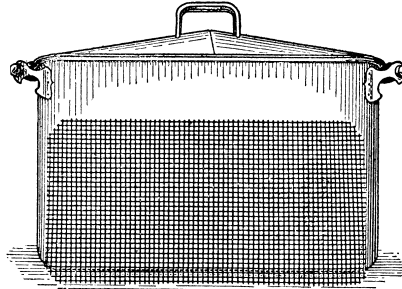


FIG. 5.—Sterilizer, showing false bottom.
Sterilizer consisting of ordinary wash boiler. In front is shown a false bottom made of wire netting.

Press down the spring at the side of the jar as shown in figure, or if screw-top jars are used, screw the top on. This will prevent any outside air from entering. The jars can now be removed and cooled or allowed to stand in the boiler till the next day.

On the second day raise the spring at the side of the jar as shown in figure, or unscrew the top, if screw-top jars are used. This will relieve any pressure from steam that might accumulate inside the jar during the second cooking. Place the jars again in the boiler and boil for one hour. Clamp or screw on the top as on the preceding day and allow them to cool. Repeat this operation on the third day. In removing the jars from the boiler be careful not to expose them to a draft of cold air while they are hot, as a sudden change in temperature is likely to crack them.

After the sterilization is complete the jars may be set aside for a day or two and then tested. This is done by releasing the spring at the side and picking up the jar by the top as shown in figure. (With screw top jars, no testing is possible.) If there has been the least bit of decomposition, or if sterilization has not been complete, the top will come off. This is be-

cause the pressure on the top has been relieved by the gas formed by the bacteria. In this case, it is always best to empty the jar and fill with fresh vegetables. If canning fruits or expensive vegetables, however, examine the contents of the jar and, if the decomposition has not gone far enough to injure the flavor, place it once more in the boiler and sterilize over again. If the top does not come off, you may feel sure that the vegetable is keeping.

DEHYDRATION OF FRUITS AND VEGETABLES.—Dehydration, or, in simpler language, drying, is an older method of preserving perishable foods than canning. That this custom, well known to our grandparents, was allowed to go out of use, is to be explained by the comparative cheapness of canning both at home and in commercial canneries. The war made canning more expensive and also made it imperative to save all food, which brought about a revival of the older method of preservation. Meanwhile the art of dehydration had been improved and the use of the method extended to a larger variety of foods, many of which are difficult to preserve by canning.

The chief practical advantage of dehydration is that it is applicable to vegetables, the lack of which in the early winter and spring diet is a serious fault from the viewpoint of either nutrition or economy. Certain fruits, notably apples, peaches, apricots, prunes, raisins, figs and dates have always been staples in the dried or dehydrated form. But until recently dried vegetables were a curiosity in the market. With the stimulation of interest in this important subject, we may now hope to see dried fruits and vegetables of all kinds in the general markets of our cities. The rural communities could preserve an ample stock of fruits and vegetables for the season of scarcity. With the general adoption of this efficient system there should be no excuse for the diet of even the poorer people being deficient in these important food groups at any season of the year.

With the first introduction of dehydrated vegetables it was natural that those firms which had developed expensive plants and equipments should represent the art of dehydration



Copyright, Underwood & Underwood, N. Y.

A vine laden with luscious fruit.

[blank page]

to be expensive and difficult. While it is true that certain effects in color and flavor retention can be better secured with expensive equipment, there is no reason why practically all fresh fruits and vegetables cannot be dehydrated with simple apparatus available to every farmer and gardener. All that is necessary is to understand the general principles and to know the correct drying temperatures for the various foods.

In order to remove the water from fresh fruits or vegetables with the least possible change in the quality of the food, it is necessary that the drying be conducted speedily. This may be done by a suitable arrangement of the drying trays and by proper slicing and spreading of the material so that the air, which must be at a proper temperature, can circulate rapidly.

This combination of conditions may be achieved in several different fashions, and the one to be chosen will depend upon the local conditions and the amount of material to be dried. In the southern and western parts of the United States it is feasible to dry most fruits and some vegetables in the open by the heat of the sun. In cooler and damper regions, or in the later part of the season artificial heat is required or one may experience considerable losses from spoilage due to rainy weather.

DRYING—OUTDOORS AND INDOORS.—For outdoor drying no special equipment is necessary, although there is more danger of spoilage by sudden showers. Greater cleanliness from dust and insects may be secured by drying under glass. Hot-bed sash may be advantageously used for this purpose. The sash need only to be set in frames that are provided at top and bottom with openings for air circulation. These may be screened to prevent the access of insects.

Where but a small quantity of material is to be dehydrated the drying may be done indoors by the heat of the stove. Open baking pans may be used, but a better plan is to make simple trays of heavy galvanized screen so that the air can pass through a number of them placed one above the other. Such a series of trays may be hung in the open above the stove. If a more

convenient dryer is required, similar trays may be fitted into a sheet metal cabinet to be placed on top of the stove. The natural rising of the heated air will cause ample circulation through the cabinet if it has openings at top and bottom.

Home dryers of this description are in the market, but they can easily be made by any man or boy handy with tools. The entire cabinet need not be made of metal, but only the bottom parts that come near the stove. The tray frames and tray slides may be safely made of wood as the material in drying is to be kept at temperature considerably below the boiling point of water.

Where electric current and an electric fan are available dehydration may be conducted at room temperatures by means of the more rapid circulation of air. For work on a small scale one needs only to make a series of trays with closed sides and open ends and set them one on top of the other and blow the air through them with a fan. The most economical results are to be achieved by the combination of the fan and the artificial heat. Where the work warrants it a larger cabinet may be made with a fan in it so located as to circulate the air rapidly through the trays. In this case the cabinet may be so constructed that the same current of air returns to the fan. If comparatively small openings are allowed for the gradual exchange of air, fan drying is very rapid and results may be achieved with such a home-made apparatus that will quite equal the best product of the large plant.

Food material to be dehydrated should be selected, washed, inferior specimens discarded, and decayed portions removed, all with the same care that would be used if the food was being prepared immediately for the table. Many farm raised people who have relished home dried apples find it impossible to eat the commercial product because of the unpleasant evidence that wormy or rotten fruit was used. The dried food should in every case be so prepared that it will be ready for cooking without further examination.

The material to be dried must be cut into thin strips or slices. There is no advantage in making the slices too thin as

they will mat together in the trays and dry unevenly. It is important that the slices be of uniform thickness, otherwise the drying will be uneven and the thin slices will be overdried before the thick ones are dry enough. As a general rule slices about one-quarter of an inch thick will give good results.

Fruits and vegetables to be dehydrated should be peeled only when those for whom they are intended insist on having the product without the peeling. Eating or refusing to eat the skins of most fruit and vegetables is a matter of habit. Many people who have been trained to eat all fruits and vegetables only after the peel has been removed object strenuously to the thought of eating fruit and vegetable skins, but if once induced to change their habit they wonder why they ever went to the trouble and waste of paring away what is often the best part of the food. If paring is insisted upon a method should be used, wherever possible, that will remove the thin outside peel only. In case of potatoes, tomatoes and beets this may be accomplished by dipping them in boiling water, the time depending on the particular product. Apples and peaches must be pared if one objects to the peel in the product. Mechanical apple parers are an improvement over the hand method, but there is no machine that will pare peaches and in commercial drying the skins are sometimes removed by a hot lye bath, which I certainly do not recommend. Potatoes if not pared should be scrubbed with a stiff brush which removes both the dirt and some of the outer layers of the skins.

As soon as fruit or vegetables are pared or sliced deterioration begins, due to contact with the air and exposure to the attack of germs of decay. The chemical changes so caused will injure both the appearance and the flavor of the fruit. It is therefore essential that drying be begun as quickly as possible and completed at a rapid rate. There are certain methods in use to check this deterioration while the drying is in progress. One such method used commercially is to expose the freshly cut product to sulphur fumes which condense in the moisture as sulphurous acid and act as a poisonous sterilizing agent. A finer looking product can be secured in this manner, but only

at the expense of wholesomeness. A more defensible plan of sterilizing the fruit or vegetables is to dip them for a few minutes into boiling water. This is not so objectionable as the sulphuring, but it results in the loss of valuable mineral salts by solution in the water. It also makes drying more difficult because of the added water that must then be evaporated.

STERILIZING WITH LIVE STEAM.—The best plan yet discovered for such sterilizing or blanching of material to be dehydrated is treatment with live steam. Where the quantity of food to be prepared is sufficient to warrant it a steaming cabinet may be constructed for the purpose. For smaller scale use a wire basket may be made to fit into a wash boiler. A little water in the bottom of the boiler will furnish the steam and strips may be placed to keep the basket out of the water. Have the material arranged loosely in the basket and expose to the steam for two or three minutes only. The steaming should be done as quickly as practical after slicing and the material should then be immediately placed in the dryer. Such treatment will check the changes that cause the darkening of the product in drying and may be used for whatever material is found to require it to prevent an inferior appearing product.

Drying must not be at too high a temperature because not only will the material be cooked, which is undesirable, but the outside will dry too quickly and the hard crust so formed will check the drying of the inner portion. Also in some cases too great heat will cause the juices to run out and be lost. The following table gives the correct temperatures for dehydrating various products, and also the yield of dried product per hundred pounds of fresh material.

	Initial temperature. Degrees Fahrenheit.	Finishing temperature. Degrees Fahrenheit.	Yield.
Apples	130	175	13
Apricots	130	160	17
Blackberries	130	145	18
Beans (string)	130	145	12
Beets	120	145	16
Cabbage	120	130	9
Carrots	120	145	11
Cauliflower	120	130	13
Celery	135	145	8
Cherries	120	150	20

	Initial temperature. Degrees Fahrenheit.	Finishing temperature. Degrees Fahrenheit.	Yield.
Corn (sweet)	130	140	28
Figs	120	140	22
Okra	120	135	10
Onions	140	140	10
Parsnips	120	145	20
Peaches	130	160	15
Pears	130	175	20
Peas	130	145	24
Potatoes (white)	125	150	24
Potatoes (sweet)	150	160	32
Prunes	130	175	30
Pumpkin	135	160	7
Raspberries	130	145	20
Spinach	130	130	9
Squash	135	160	8
Tomatoes	120	140	8
Turnips	140	165	9

None of these foods should be completely dried. The purpose is to reduce to about the state of dryness of cereals, that is, to about ten per cent of water. Sweet fruits do not need to be as dry as that, as the sugar acts as a preservative. In drying vegetables the process should be continued until no moisture can be squeezed from the dampest pieces with the fingers.

After the material is removed from the dryer it should be conditioned by being placed in an open bin and stirred occasionally. This will cause the moisture in the various portions to be evened up. The product should then be stored in paper or muslin bags or in paper or wooden boxes and should not be sealed in air-tight containers, which would cause it to "sweat" and spoil. The object in storing it is simply to keep out insects and dust. Material that has been dried in the open may be infected with insect eggs and therefore should be heated in the oven to a temperature of 180 degrees to kill all insect life before storing.

In preparing dehydrated foods for the table they may be either soaked in cold water in the case of foods that would be eaten raw in the fresh state, or they may be steamed, stewed or boiled. Proper methods of dehydrating cause little change in food value, and is on the whole less destructive to the nutritive properties than canning or other methods of preservation. Almost all dehydrated products undergo some alteration in

flavor, and may not at first appeal to the taste, but this slight distinction in taste is not a sign of inferiority and many people, after getting accustomed to the dehydrated product, like it as well, at least by way of variety, as they do the fresh article.