

Canning and Preserving

IN THE HOME

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The human body may be kept in perfect order by using the proper quantities of the different foodstuffs to meet the demands of the body under whatever conditions the person may be living. Should, however, too little or too much of some kinds of body building material be taken into the system than can be disposed of without over-taxing the organs of the body, the result may be disease, which will necessitate the taking of medicines. To avoid this, the use of a moderate supply of fruits and vegetables—both raw and cooked—will keep the blood in a healthy condition, and also assist in a healthy intestinal action. Dangers may arise from eating too much unripe or over-ripe fruit, such fruit if cooked is less dangerous, but not so refreshing as raw, and has not the same flavor. The addition of sugar adds to the nutritive value, but changes the flavor, and is likely to make it less digestible.

Fresh fruits in season make an excellent substitute for desserts, or may be combined with other food materials to make many tempting dishes which will relieve the digestive organs of their strenuous efforts of digesting pies, which are the daily dessert in many homes.

Greater interest should be taken in growing an abundance of different fruits suited to the locality, in order to provide a sufficient supply for the summer season, and also enough for the canning and preserving for winter use, since it is not always convenient, and is less economical to purchase them on the market.

The first cost in purchasing a canning outfit is the greatest, but with reasonable care, it should last for years, and when the improved health of the family, and the reduction in doctor's bills are considered, it may be considered a wise and profitable investment.

COMPOSITION OF FRUIT.

The general composition of fruit is as follows:

Water	85 to 90 per cent.
Proteid	$\frac{1}{4}$ per cent.
Fat	$\frac{1}{4}$ per cent.
Cellulose	2 $\frac{1}{2}$ per cent.
Carbohydrates	5 $\frac{1}{2}$ to 10 $\frac{1}{2}$ per cent.
Mineral matter	$\frac{1}{4}$ per cent.

In looking at the above, one observes that the food value is very low, since there is 85-90 per cent water in the composition. The chemical composition of fruits varies greatly as the process of ripening takes place. This change may continue after the fruit has been stored, and improve the fruit, or sometimes it causes it to deteriorate rapidly and become unfit for use. Green fruits usually are more acid than ripe, and contain a greater percentage of starch, woody material and pectin, (the jelly-like substance into which the pectose of unripe fruit is changed) and less of different kinds of sugar. It is partly on account of the presence of so much starch in the unripe fruit that necessitates cooking it, and as the fruit ripens, the starch is converted into sugar, and therefore ripe fruit (if not over-ripe) is quite safe to eat raw.

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CANNING AND PRESERVING.

The terms "canning" and "preserving" are rather confusing to many, and are used interchangeably. "Preserving" fruit is cooking it with three-fourths to its whole weight of sugar. By this method much of the natural flavor of the fruit is destroyed, and for that reason, and the richness of the mixture, is not now so commonly used as "canning," which is preserving sterilized fruit in sterilized air-tight jars, with or without sugar—sugar being necessary only to give sweetness. Fruit which is canned is kept soft and juicy, and more easy of digestion than that which is cooked in a large quantity of sugar. From a dietetic standpoint, the housewife should "preserve" only a sufficient quantity of fruit to give variety and for special uses, such as filling for tarts, etc., and provide as generously as possible a bountiful supply of "canned" fruits.

The object of "canning" and "preserving" is not so much to exclude the air as to exclude bacteria. Our grandparents no doubt imagined that it was the air which caused fruit to spoil, but scientists, by experiment, prove to us that it is the microscopic organisms which are in the air and get into our food which cause the trouble. Air in a can, if thoroughly sterile, will not cause fruit to spoil—a jar may be only half full of fruit and keep perfectly, providing the fruit, jar, rubber and cover are sterile, and no micro-organisms have access to the jar. Unless a spoon or knife is also sterile, it is not safe to slip it down the side of the jar to allow the escape of the air bubbles which may be there, for it might have some of the these microscopic, yet dangerous, bacteria on it, which might cause the loss of the entire can of fruit.

The most favorable conditions for the growth of all micro-organisms are warmth, food, moisture and air, but if these are not given in the right degree, life is dormant or destroyed—for instance freezing will check growth, and they remain in the spore form until the proper degree of warmth is again given. Boiling temperature, if continued long enough, will destroy life entirely. Spores may have been formed, some of which will resist even boiling temperature. Repeated boiling, or intermittent boiling, will finally destroy them, since each time growth occurs they lose some of their power to resist heat and cold, and if one perseveres with boiling the food, the life of the micro-organism will finally be destroyed. For this reason, we find food which has stood twenty-four hours and shows sign of growth of spores, being cooked a second time and allowed to stand another twenty-four hours, after which another boiling is given to make doubly sure of destroying all life.

STERILIZING AND PASTEURIZING.

Sterilizing a substance is to destroy all life and source of life in and about it. To accomplish this, the substance must be kept at a temperature of 212 F. for two or more hours, for it has been shown that ordinary boiling for a short time has not been sufficient to destroy some spores which can resist the boiling temperature for a short time, and when favorable conditions are given again, they revive and grow.

Pasteurizing is not sufficient for canning purposes, since it consists in keeping the liquid (usually milk) for fifteen or twenty minutes at a temperature of 140 F. to 160 F. This kills all active bacteria and destroys the spores of tuberculosis, typhoid, diphtheria, cholera and all fever-producing germs.

METHODS OF CANNING.

Foods—especially fruits and vegetables—are canned by many different methods to keep them from one season to another. The following are the most common of the home methods:

1. By cooking in hot water bath.
 - (1) On the stove.
 - a. By cooking once, and if no sign of bacterial growth is visible, it will keep indefinitely.
 - b. Intermittent process—cooking every twenty-four hours until growth disappears.
 - (2) In the oven.
 - (3) In the fireless cooker.
 - (4) By pouring boiling syrup on small fruits in jars and putting in boiling water and let them cool.
2. Cooking or stewing in a preserving kettle.
 - (1) Cooking in a syrup for a short time and putting into sterilized jars.
 - (2) Cooking with an equal weight or large quantity of sugar. This is known as "preserving."
3. Baking.
 - (1) In the oven.
 - (2) In the sun.
4. The autoclave.
5. Jelly making and marmalades.

The following directions give an idea of these methods of canning and preserving:

FRUIT COOKED IN A WATER BATH.

1. Prepare fruit and syrup—the richness of syrup depends on the fruit and individual taste.
2. Fill sterilized jars with fruit and cover with syrup, then put covers on loosely.
3. Place on a wooden rack in the boiler.
4. Add warm water to come 4 in. above the rack.
5. Place the filled jars on the rack far enough apart to not touch one another.
6. Pack securely with cotton to prevent the jars striking when the water boils.
7. Cover and cook ten minutes or more (according to the fruit) after the water boils.
8. Remove cover from boiler to allow steam to escape.
9. Remove one jar at a time and fill to overflowing with boiling syrup and seal.
10. Set aside where there is no draught and screw up tops as they cool and contract.
11. Jars may be turned on end to see if they are air-tight.

Another similar method is sometimes followed by putting only the fruit in the jars, and when cooked part of the juice may be drained off and used for jelly, and the jars filled as above with boiling syrup.

FRUIT COOKED IN THE OVEN.

1. Cover bottom of oven with a sheet of asbestos (may be obtained at plumber's shop) or use pans with 2 in. of boiling water.
 2. Sterilize jars and utensils.
 3. Make syrup and prepare fruit.
 4. Fill jars with fruit, then add syrup to fill solidly.
 5. Run a sterilized silver knife around the inside of the jar, then cover and place in a moderately hot oven on asbestos or in pan of water, and cook ten minutes.
 6. Remove and fill jars with boiling syrup.
 7. Wipe, seal and let stand where there is no draught. Screw tops as they cool.
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JARS IN COMMON USE IN CANNING

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| 1. Economy (quart) | 2. Improved Gem with hollow top. | 3. Mason Fruit | |
| with porcelain top. | 4. Crown. | 5. Economy (pint) | 6. Jar |
| with paper-fitted screw top for jelly. | 7: The Perfect Seal. | | |
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FRUIT COOKED IN THE FIRELESS COOKER.

The above method may be used, except the jars will be placed in the cooker on the heated disc of the cooker instead of using the oven, and leave it covered over night.

1. Pack prepared fruit in jar.
2. Adjust rubber and cover.
3. Fill to overflowing with hot syrup.

4. Seal at once.
5. Set in fireless cooker kettle which has been warmed, and cover completely with boiling water.
6. Cover the kettle at once and set away in cooker over night or until cold.

Small fruits retain shape color and natural flavor by preparing fruit and putting into sterilized jars. Make syrup and while it is boiling, pour it over the fruit, (sliced peaches are excellent done in this way) and seal as tightly as possible. Put in a pot and pour boiling water around it to almost cover the jar. Cover closely, and as the water cools, tighten the tops. Turn upside down to be sure they are air-tight.



UTENSILS IN COMMON USE FOR CANNING

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| 1. Enamel Kettle. | 2. Aluminum Kettle. | 3. Wire Basket. | 4. Enamel Colander. |
| 5. Large Wire Strainer. | 6. Small Wire Strainer. | 7. Glass Measuring Cup. | 8. Tin Measuring Cup. |
| 9. Fruit Funnel. | 10. Enamel Spoon. | 11. Silver Spoon. | 12. Wooden Spoon. |
| 13. Fruit or Vegetable Press. | 14. Fruit Masher. | 15. Pint Enamel Measure. | 16. Quart Enamel Measure. |

COOKING IN PRESERVING KETTLE.

There are different methods of cooking fruit in a kettle, all of which may give good results, but if the desired result is to have the fruit whole, particularly small fruits, better satisfaction may be obtained by cooking the fruit in the jars.

One method is to make a syrup of the desired proportions and drop the fruit into it and cook gently until it has boiled and the cellulose is soft

(test with a wooden skewer). Care must be taken with soft juicy fruits to not cook too large a quantity at once, to not break the fruit in filling the jars, and to fill them quickly so that the boiling temperature is maintained until the jar may be hermetically sealed.

Another method is to use equal weights of fruit and sugar and put all into the kettle together. Stir until sugar is dissolved, and allow to boil until a thick jam is the result—this is known as “preserving.”

CANNING BY BAKING.

1. In the oven.—Put the prepared fruit into sterilized jars and pack rather closely. Fill the jars with syrup of the desired sweetness. Cover and set on asbestos or in a pan of hot water and cook in a moderately hot oven until the fruit is soft. If sugar is omitted the jars may be filled with the cooked fruit and placed in the oven again to thoroughly heat through again.

THE AUTOCLAVE.

The autoclave is a utensil in which steam is under pressure, and by which a temperature higher than that of boiling water may be obtained. It is rather difficult to get the correct temperature, and therefore requires careful handling to prevent the blowing up of the apparatus. Since a higher temperature may be reached by this method than by ordinary boiling, it does away with the intermittent cooking. The autoclave is used in some households where canned fruit is sold in jars to realize a profit.

JELLY-MAKING.

Jelly-making involves the principles of canning and preserving, but in fruits for this purpose the pectin has to be carefully considered. Pectin is a carbohydrate which, in some respects resembles gelatin. It dissolves in boiling water, and stiffens on cooling. It is most abundant in the harder parts of the fruit, the core and the skin. The fruits best suited for jellies are apples, quinces, crab-apples, currants and grapes. The ideal jelly should be “a beautifully colored, transparent, palatable product, obtained by so treating fruit juice that the resulting mass will quiver, not flow, when removed from its mold; a product with texture so tender that it cuts easily with a spoon, and yet so firm that the angles thus produced retain their shape; a clear product that is neither syrupy, gummy, sticky nor tough; neither is it brittle, and yet it will break, doing this with a distinct beautiful cleavage that leaves sparkling, characteristic faces. This is that delicious, appetizing substance, a good fruit jelly.”

Points in jelly-making:

It is important for jelly-making that the fruit juice contains pectin and acid. The juices should be extracted by cooking them out of the fruit. The cause of failure in jelly-making is often due to an over proportion of sugar to juice, that is to the pectin in the juice. The correct proportion of sugar varies from three-fourths to an equal measure of sugar to an equal quantity of juice. Danger lies in over cooking the jelly after sugar is added. The time varies according to the proportion of sugar to juice, the proportion of pectin in the juice, and possibly the acidity of the juice. When the proper consistency is reached, the hot jelly should be at once poured into sterilized glasses and when “set,” should be sealed. The addition of vegetable acid to juice which is only slightly acid, will give good results, as in the case of sweet apples. The inner skin of oranges and lemons is an excellent source of pectin, and may be used for strengthening other fruit juices. Apple juice may serve as a basis for other fruit jellies without lessening the flavor of the other fruit.

GENERAL DIRECTIONS FOR JELLY-MAKING.

1. Wash fruit, remove stems and imperfections.
2. Cut large fruit into small pieces.
3. Use no water with watery fruits—grapes and currants.
4. Apples and quinces require water to nearly cover, and require frequent stirring to prevent burning on bottom of the kettle.
5. Cook fruit until juices flow, and crush it.
6. Strain through a jelly bag which has been sterilized.
7. Do not squeeze at first—keep the squeezed juice separate.
8. Measure juice and heat three-fourths to an equal quantity of sugar according to juice. Use best sugar.
9. Boil together until jelly thickens slightly when dropped on a cold plate.
10. Pour into sterilized jelly glasses, and set aside to harden.
11. When cold cover with paraffin $\frac{3}{8}$ in. thick and put on covers.

Good jellies cannot be made from all juices, and require much practice to arrive at perfection in the home. The influence of sugar, acid and boiling have a great influence on the "setting" properties of pectin.

Molds.

The presence on the top of fruit or jelly of mold, with which every housewife is familiar, is positive proof that one or more of the essentials of canning has been carelessly guarded. Molds are not so injurious as bacteria, and do not penetrate so deeply into preserves or jelly as into liquids and porous foods containing moisture, such as cake and bread, nevertheless, every care should be taken to prevent their entrance into any food.

WHY FRUIT SPOILS.

Causes of spoiled fruit when canned are traceable to the environment, the food, the vessels in which they were canned, and lack of thorough sterilization. No imperfect fruit should be used, for as soon as the skin is broken, bacteria and molds find access to the wound, and spores are developed which are more difficult to destroy than the bacteria, and if not cooked until no life remains, the result will be growth and fermentation. It is, therefore, most important to always use a high temperature. Other causes for fruit spoiling are that proper methods have not been followed explicitly, imperfect or chipped jars and old rubber rings may have been used. A little expenditure of a few cents for new rubbers every year is a good investment, as it may be a means of saving many dollars by preventing the access of germ-laden air to the canned fruit.

IMPORTANT POINTS IN HOME CANNING OF FRUIT.

Some of the most important points to observe in home canning are, therefore, to have a sanitary kitchen, free from dust and foreign odors; to have perfect fruit in shape and quality; the syrup clear, rightly proportioned and boiling hot; the jars sterilized, hot and filled to overflowing, and sealed quickly and thoroughly that no unsterilized air may be left inside. Have all utensils in order and at hand to prevent delay in working. Large-mouthed glass jars with glass covers or porcelain-lined screw covers are best. For small families use pint jars. They should be scalded and the covers and rubbers clean and perfectly fitted. A clamp is a great convenience, as the jar may be held over the kettle while it is being filled. Care must be taken to hold the jar slightly on its side and gradually pour some hot juice in it and shake around to heat the jar evenly and prevent cracking. A wide-mouthed fruit funnel is an aid in filling the jars. Fill to overflowing and seal quickly and tightly.

UTENSILS FOR CANNING PURPOSES.

In preserving, canning and jelly-making, utensils should be used which will not be acted upon by the acids of the fruit to form chemical combinations with the fruit juice which will cause bad color or taste, or form injurious compounds. This will exclude iron or tin utensils, and give preference to the porcelain lined kettles. Even in using these, care should be taken not to use chipped vessels or "seconds." Aluminum is a comparatively new ware, and gives excellent satisfaction since it is not affected by acids, does not burn readily, heats quickly, retains the heat, is light and easily cleaned. Wooden and silver spoons are best, each having its advantages, and disadvantages—wood discolours very readily. All utensils may be obtained in a variety of wares in a good range of prices to suit individual requirements.

The following itemized list covers the utensils necessary for this purpose, but many housewives could do most satisfactory work with a much more limited equipment.

Two preserving kettles	Flat bottomed clothes boiler with
A colander	wooden rack, iron tripod or ring
A fine strainer	Several yards of cheesecloth
A skimmer	Flannel straining bag
Ladle	Three cheesecloth bags
Large mouthed funnel	Frame for jelly bag
Wire frying basket	A fruit pricker
Sieve	Strawberry huller
Three long-handled wooden spoons	Two stone crocks
Large silver spoon	A wooden masher
Large pans	Two or three saucepans
Three paring knives	A large dishpan

A syrup gauge might be used for testing the syrup. It is a graduated glass tube with a weighted bulb registering from 0 degs. to 50 degs. When placed in the syrup it begins to rise according to the sugar present. Experiments have proved that if sugar dissolved in heated fruit juice causes the gauge to register 25 degs., the proportions are right to combine with the pectin and give the best jelly.

Proportion of sugar and water.

The following proportions may serve as a guide in canning and preserving:

2 cups sugar to 1 cup water for preserving strawberries and cherries.
2 " 1 1/2 " preserving peaches, plums.
2 " 2 " preserving acid fruits.
2 " 4 " for canning pears, peaches, sweet plums, cherries, raspberries, blueberries and blackberries.

It is a matter of individual taste the amount of sugar used, but the less sugar the more of the natural flavor of the fruit will be retained. The process of making the syrup is to put the sugar and water in the kettle and stir on the stove until the sugar is dissolved, then gradually bring to boiling point and boil gently without stirring from ten to thirty minutes, according to the desired richness of the syrup.

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