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Fruit Jellies, Preserves, Jams, Marmalades, Conserves and Butters
Michigan State University Extension Service
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FRUIT JELLIES, PRESERVES, JAMS, MARMALADES, CONSERVES, AND BUTTERS*

Food may be preserved by the use of sugar. A concentrated sugar solution retards the growth of micro-organisms, and therefore tends to prevent spoilage. Sugar-preserved fruit products are named according to their consistency, which is determined partly by the type and the form of the fruit, partly by the method of cooking, and partly by the quantity of sugar contained. This group of products includes jellies, preserves, jams, marmalades, conserves, and butters.

FRUIT JELLIES

An ideal jelly has a bright color and delicate flavor, characteristic of the fruit from which it is made. When turned out onto a plate, a mold of jelly should be translucent and should hold its shape but quiver when the plate is moved. Jelly should be so tender that it cuts easily with a spoon, yet breaks with a sharp cleavage line and shows sharp faces.

In order to make a fruit jelly which sets successfully, at least three substances must be present in the right proportions—pectin, acid, and sugar.

Fruits for Jelly Making—Usually the following fruits contain sufficient acid and pectin to make good jelly.

Tart apples, such as Winesap	Wild grapes or cultivated grapes
Blackberries	of slip-skin type, such as Con-
Crabapples	cord
Cranberries	Plums
Currants	Tart quinces
Gooseberries	Raspberries, black and red

Often the juices of two fruits may be mixed to give jellies of delicious blended flavor, of particularly attractive color, or to combine juices which together furnish the necessary acid and pectin. Good

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combinations are currant and raspberry, raspberry and gooseberry, apple and quince, grape and crabapple, cranberry and quince. Furthermore, by the addition of prepared pectin, good jellies may be made from many other fruits ordinarily not used for jelly making because they lack pectin. (Special directions accompany the commercial pectins on the market and should be carefully followed. The directions given here deal only with fruits which should yield good jelly without the addition of pectin.)

Variations in the acid and pectin content of fruits may occur with variety, season, or locality of production. The recommendation is frequently made to test fruit juices for pectin by adding alcohol, and to make this test the basis for determining the quantity of sugar to be used for jelly. This test is confusing in its results, however, because other substances in fruit juices besides pectin may be precipitated by alcohol. More emphasis is placed here upon selection of the fruit and care in following the details of the procedure than upon a test for pectin.

Juices suitable for jelly making are definitely acid in flavor. If acid seems lacking a precaution is to add it in the form of 1 tablespoon of strained lemon juice to each standard measuring cup of fruit juice. This not only facilitates jellifying but adds to flavor. Tart apples, crabapples, cranberries, currants, wild grapes, gooseberries, plums of Wild Goose type, and tart quinces give no trouble from insufficient acid. But some blackberries, black and red raspberries, ripe Concord grapes, plums and quinces may require additional acid to make them yield good jelly.

Equipment—Jelly-making equipment includes:

Pans for washing fruit	Tray
Brush for hard fruits	Jelly glasses
Colander	Large pan for sterilizing jelly glasses
Stainless steel paring knives	Saucepan for cooking jelly
Scales	Teaspoon
Quart cup	Tongs for jars
Standard measuring cup	Paraffin
Large kettle for cooking fruit	Small pan for melting paraffin
Long-handled spoons	Labels
Support for jelly bag	
Jelly bag, cotton flannel with nap side in, or 2 or 3 thicknesses of good quality cheesecloth, or a sugar bag	

Selection and Preparation of the Fruit—Select a mixture of slightly underripe and ripe fruit. The slightly underripe fruit contains more acid and pectin, and the ripe fruit furnishes more desirable flavor. Overripe fruits should not be used. The juice may fail to jelly because of its low acid content.

Wash all fruit thoroughly and discard any damaged parts. Wash berries quickly and with care. Leave currants on their stems, and leave the skins on grapes and plums. Remove stems and blossom ends of apples and quinces and cut the fruit into pieces, but do not remove cores or skins.

Prepare small lots of fruit at a time, and carry the jelly process through promptly. For example, cook up and extract juice from about 6 quarts of currants at a time, or 8 pounds of apples or grapes. If a large quantity of jelly is to be made, start a second lot of fruit cooking as soon as the first has finished dripping from the jelly bag, or use more than one jelly bag.

Extracting the Juice—Pectin can be extracted only by cooking the fruit. In cooking normally juicy fruit, it is desirable to add only the quantity of water specified. If too much water is used, the excess water has to be cooked out, and the prolonged cooking is destructive of pectin, flavor, and color.

If the fruit is lacking in normal juiciness, as it may be when grown under drouth conditions, double the proportion of water and increase the time of cooking to soften the fruit.

QUANTITY OF WATER TO 1 POUND PREPARED FRUIT

FRUIT	WATER
Apples	1 cup, or water to cover
Crabapples	1 cup, or water to cover
Blackberries }	Firm fruit, $\frac{1}{4}$ cup Very soft fruit, no water
Black raspberries }	
Cranberries	3 cups
Currants	$\frac{1}{4}$ cup, or no water
Gooseberries	$\frac{1}{4}$ cup
Grapes, cultivated, such as Concord	$\frac{1}{4}$ cup, or no water
Grapes, wild	1 cup
Plums, Wild Goose type	$\frac{1}{2}$ cup
Quinces	2 cups, or water to cover
Red raspberries	No water

Cook the fruit in a broad, flat-bottomed kettle and stir to prevent scorching. Crush soft fruits to start the flow of juice. Count time only after the fruit begins to boil. Berries, currants, and grapes need 5 to 10 minutes to cook soft; apples and quinces need about 25 to 30 minutes—all depending on the firmness of the fruit.

Pour the hot cooked fruit at once into a jelly bag of canton flannel, or of two or three thicknesses of good quality cheesecloth, or unbleached muslin. Let the juice drop out; do not squeeze the bag. When the drops are few and far between, press the bag lightly with the flat side of two knives to start the flow again.

Some fruits, such as currants, crabapples, and wild grapes, are so rich in jelly-making power that two extractions of juice can be made from the same fruit. As soon as juice ceases to drip after the first cooking, turn the pomace back into the kettle, barely cover with water and boil gently with frequent stirring. An asbestos mat beneath the kettle will help to prevent burning. Heat gradually and simmer from 15 to 20 minutes and extract the juice as at first. Some jelly makers mix the juice of the first and second extractions. Others prefer to keep the two extractions separate and make jelly from each lot. If all the juice has good color and strong jelly making power there is little choice between these two methods.

At this point, before going on with the jelly, wash the jelly glasses, place them on a rack in a pan of cold water, bring to boiling, and boil until the jelly is finished. As the glasses are removed for one lot of jelly, add more to keep a continual supply of sterilized jelly glasses. To prevent breaking, dip the edge of the glass in the water, so that the boiling water reaches both sides at once.

Combining Sugar and Juice—Use granulated white sugar. Repeated tests in the laboratories of this bureau show that results are exactly the same with refined cane sugar and refined beet sugar.

Work with small lots of juice at a time—about 6 to 8 cups. This quantity of juice with the sugar boils down quickly to the jelling stage, and short cooking retains the fresh fruit flavor and color, and makes jelly of the best texture.

Measure the sugar and the extracted fruit juice accurately, and use the following proportions:

QUANTITY OF SUGAR TO 1 CUP JUICE

FRUIT	SUGAR (CUPS)
Apple	$\frac{3}{4}$
Crabapple	1
Blackberry	$\frac{3}{4}$
Black raspberry	$\frac{3}{4}$
Cranberry	$\frac{3}{4}$
Currant	1
Gooseberry	1
Grape, cultivated, such as Concord	$\frac{3}{4}$ to 1
Grape, wild	1
Plum, Wild Goose type	$\frac{3}{4}$
Quince	$\frac{3}{4}$
Red raspberry	1

Boiling Down for the Jelly Test—Heat the fruit juice and sugar quickly to boiling, using a large flat-bottomed sauce-pan that permits rapid evaporation. Stir only until the sugar is dissolved, no more.

Boil rapidly until the jelly test is reached. For this test, dip a large spoon into the boiling syrup, and lift up the spoon so that the syrup runs off the side. As the syrup cooks down it reaches a stage when it no longer runs off the spoon in a steady stream, but separates into two distinct lines of drops, which "sheet" together. Stop the cooking, as soon as the boiling syrup gives this "sheeting off" test.

Let the hot syrup stand in the kettle while lifting the clean jelly glasses from the boiling water onto a tray. Then skim off the film from the hot jelly, and pour into the hot drained glasses carefully so that the jelly does not splash up or drip onto the rim.

Cover with clean cheese cloth and let the glasses stand until the jelly has set—for 12 hours or longer.

Sealing and Storing—When the jelly is firm and well set, be sure that the inside rims of the glasses are free from drops of jelly. A good seal cannot be obtained with paraffin unless the glass is clean and dry. Pour melted paraffin over the top and rotate each glass in the hand so that the hot paraffin runs up to the rim to form a good seal. Cover

and label with name of fruit and date of making, and store in a cool, dry place.

Yield of Jelly—Two pounds of prepared fruit yields approximately 1 pint of juice. One pint, or 2 cups of fruit juice made up with an equal quantity of sugar yields about $1\frac{1}{2}$ pints of jelly.

Utilizing the Left-over Pomace—The fruit pomace remaining after the juice has been extracted for jelly can oftentimes be made into fruit butter.

Special Problems in Jelly Making

Temperature Tests for Jelly—The recommendation is frequently made that jellies be cooked to a certain temperature, as to 219° or 221° F. Experience has shown that dependence cannot be placed upon the temperature tests for jellies. Temperatures reached when the sheeting off test is given may vary with the kind or condition of the fruit.

Jelly from Stored Fruit Juices—Fruit juices may be canned and stored to be made into jelly later. This practice makes it possible to handle larger quantities of fruit during a rush season.

Fill hot sterilized glass jars with the juice, partially seal, place on a rack in hot water to cover, bring water to boiling, and boil 20 minutes for pint and quart sizes. Complete the seal at once, and store in a cool, dry place protected from light.

Jelly made from fruit juice which has been stored for three months may have as good texture as jelly from fresh juice. It may show, however, some loss in the color and flavor, especially in red fruits.

Sugar Crystals in Jelly—Sugar crystals in jelly may result from an excess of sugar, overcooking of the jelly, lack of sufficient acid in the fruit, or allowing jelly to stand too long before sealing.

Crystals in Grape Jelly—Crystals of cream of tartar, potassium acid tartrate, form in jelly from cultivated grapes. The crystal formation may be reduced by any of the following methods:

1. Allow juice to stand overnight, then siphon off or strain.
2. Can the juice and allow to stand for some time before making into jelly.
3. Combine with other fruit juices.

Weeping in Jelly or Syneresis—Weeping or syneresis occurs in jellies from very acid fruits, especially cranberry and currant. These jellies should be stored in containers of a size to be used at one meal.

Mold on Jelly—Molds may grow on jellies when the paraffin layer has become loosened or on jellies which have oozed, or jellies stored in a hot damp place. Mold growing on top of the paraffin is not likely to affect the jelly. But if mold grows beneath the paraffin, the flavor of the jelly may be impaired.

Fermentation of Jelly—Fermentation of jelly is caused by yeast or bacteria. Steps to safeguard against fermentation are: use of new paraffin each year; use of sterilized jelly glasses; protection of jelly from contamination before sealing; care to obtain good seals; and proper storage.

PRESERVES, JAMS, MARMALADES, CONSERVES, FRUIT BUTTERS

Essential differences between preserves, jams, marmalades, conserves, and fruit butters are nowhere clearly defined. The following definitions are based on the best opinion at the present time and are planned to indicate differences in preparation rather than to include all terms in common usage.

Preserves—A fruit preserve consists of whole small fruits or pieces of larger fruits, cooked in a syrup until clear and stored in the syrup or the jellied juice.

While the fruit is cooking it absorbs sugar from and gives up juice to the syrup. At the same time the syrup is concentrated to a degree that will preserve the product. The aim is to bring about the exchange from syrup to fruit without undue change in shape of the fruit or toughening of its tissues. To accomplish this the different types of fruit must be handled differently.

The following general rules will help to explain the detailed directions given on pages 9 to 15.

Fruits commonly used are cherries, peaches, pears, plums, quinces, strawberries, watermelon, yellow tomatoes, and figs.

Select, if possible, varieties which tend to hold their shape. With such soft fruits as apricots and peaches, use those slightly underripe. Pick over all berries carefully, wash and drain. Wash, stem, and seed cherries. Wash and prick the skins of plums to prevent shrivelling of the fruit. Remove skin of soft fruits, such as peaches, apricots, figs, and tomatoes, by a hot dip. Pare and core pears and quinces, and cut them into halves or quarters as desired. Pare watermelon rind and cut into pieces of desired size.

Weigh the fruit and use three-fourths or an equal weight of sugar.

All fruits must be heated, either in syrup or in water, to change the cell walls so they will absorb sugar. To retain the shape and flavor of soft fruit, avoid cooking it any more than necessary. Cooking in syrup toughens the cell wall material. This tends to make soft fruits firm but will toughen very firm fruits, such as some pears, quinces, and watermelon rind. Prevent toughening of the fruits by cooking in water or dilute syrup until tender before putting them in the concentrated syrup.

Fruits, such as cherries, peaches and pears, which do not give up their juices readily, may be covered with sugar to draw out the juice; or a small quantity of water may be added to the fruit and sugar to form a syrup. Boil the fruit and sugar mixture until the fruit becomes clear. Drain the fruit and place it in a sterilized jar, filling the jar about three-fourths full. Concentrate the syrup by further boiling, pour it over the fruit while hot, and seal the jar.

For juicy fruits of soft texture, two methods may be used as follows:

METHOD 1. Add sugar and bring slowly to boiling, cooking the fruit until just tender. Set aside for several hours to allow the fruit to absorb more syrup and so "plump up". Reheat to boiling and pour into sterilized jars and seal. If the syrup seems too thin, drain from the fruit and concentrate by boiling. Add to the fruit while hot and seal.

METHOD 2. Crush a small portion of the fruit and heat while stirring for about 3 minutes. Strain. Add sugar to the juice and stir while heating slowly until sugar is entirely dissolved. Drop fruit into this syrup and simmer 3 to 5 minutes, then boil rapidly 10 to 15 minutes, or until fruit is somewhat clear. Let fruit stand in syrup several hours to become plump. Drain and place in sterilized jars. Cook the juice rapidly until fairly thick, pour over the fruit and seal.

The method for making "sun cooked" preserves is that described for strawberries on page 11. This method may be used successfully for other small, soft fruits. Hot sunshine is required to cause the necessary evaporation.

Remove scum before pouring preserves into jars.

If the fruit is one which contains pectin and acid, concentrate the syrup until it gives the jelly test. Otherwise concentrate it until just a little thicker than for jelly (boiling point 219°-223° F.). To bring about a slightly jellied juice, which increases the attractiveness of preserves of most kinds, add pectin. Use commercial pectin directions for this process.

Jams—Jams differ from preserves in that no effort is made to retain the shape of the fruit and a more or less homogeneous mixture results. Ordinarily, jams are made from small fruits and the entire fruit is used. Of large fruits only the fleshy portions are used.

Well-ripened fruit is desirable both for flavor and texture. It should be prepared and weighed as for preserves. The proportion of sugar required is the same ($\frac{3}{4}$ to equal parts). One fruit may be used alone or with others in desirable flavor combinations. Jams may be crushed or "cooked up" as desired. A wooden potato masher is useful in crushing. A short cooking with the addition of a small amount of water before sugar is added helps in the extractions of any pectin. Add the sugar to the boiling mixture and cook until a good jelly test is obtained. In case the fruit does not contain pectin or acid, either may be added as in jelly or preserves. Jam made from fruits without pectin is cooked to a slightly thicker consistency than for jelly, as is recommended, also, in the case of preserves.

Marmalades—Marmalades have the characteristics of jellies and preserves combined. They contain the pulp and may contain the skin also, suspended in jellied juice. They are prepared from pulpy fruits, preferably those that contain pectin. Citrus fruits are especially desirable for flavor and pectin content. The pectin is extracted more rapidly by cooking the fruit before the sugar is added. The fruit is added in distinct slices or shreds and is cooked until clear.

Conserves—Conserves are similar to jams, but they always contain a mixture of fruits and usually have nuts and sometimes raisins added.

Fruit Butters—Fruit butters are made by cooking the pulp of any fruit to a smooth consistency, thick enough to hold its shape and soft enough to spread easily. They are usually sweet, with acid or spice added as desired, depending upon whether they are to be served as a relish or a spread. The residue left after extraction of juice for jelly may be used as a source of pulp for butter. In this case it is desirable to add spice or acid.

Fruits most commonly used for butters are tart apples, apricots, crab-apples, grapes, peaches, pears, plums, and quinces.

Use only sound fruit, sound portions of windfalls or culls, or pomace from jelly making. Wash the fruit thoroughly. Prepare the fruit for cooking and add liquid as follows:

Apple—Cut the fruit in quarters and add half as much water or cider as fruit.

Apricot—Scald, remove skins and pits, crush and cook in own juice.

Crabapple—Cut in quarters, remove stems and blossom ends, and add half as much water as fruit.

Grape—Remove from stems, crush and cook in own juice.

Peach—Scald, remove skins and pits, crush and cook in own juice.

Pear—Quarter, and add half as much water as fruit.

Plum—Crush and cook in own juice.

Quince—Cut into small pieces, and add half as much water as fruit.

Cook with constant stirring until the fruit is soft. Put through a colander, then through a fine sieve to remove all fibrous material and give a smooth mass. Measure the pulp and add one-half the measure of sugar. Add a little salt, spices as desired, and acid, such as lemon juice if needed. Cook rapidly with constant stirring to prevent scorching. As cooking progresses reduce the heat, somewhat to prevent spattering. When the butter is thick and has taken on a glossiness of sheen, pour while boiling hot into sterilized containers and seal.

Use only fresh spices and enough to give a delicate spiced flavor. Spice should not obscure the natural fruit flavor.

If a light-colored butter is desired, whole spices may be tied in a small cotton bag and left in the fruit butter only during the cooking period.

DIRECTIONS

On the following pages, in tabular form, are directions for making preserves, jams, marmalades, and conserves of a number of the common fruits.

Preserves

Fruit	Preparation	Proportions				Method
		Prepared fruit	Liquid	Sugar	Other ingredients	
Cherry.....	Pitted.....	To each pound pitted cherries use	Juice from pitting	$\frac{3}{4}$ lb. to 1 lb.	.....	Combine sugar and fruit in alternate layers and allow to stand overnight to extract juice. Or add the sugar to the fruit and stir gently while heating slowly to boiling. Boil rapidly until somewhat thick, taking care to prevent burning. Allow to stand in syrup overnight. Drain off syrup and fill jars with fruit to within 1 inch of top. Bring syrup to boiling, pour over fruit, and seal.
Peach.....	Pare, cut into halves, and remove pits. Or if clingstones, pare and cut flesh from pits.	To each pound use	None or $\frac{1}{2}$ cup water	$\frac{3}{4}$ lb. to 1 lb.	.....	Combine sugar and fruit in alternate layers and allow to stand overnight to extract juice. Stir while heating slowly to boiling. Or prepare a syrup, add fruit and boil rapidly. Cook until fruit is tender and clear. Pour into hot sterilized jars and seal.
Pear.....	Pare, cut into quarters and remove cores. Leave small pears whole, removing blossom-end but not stems.	To each pound use	None or 1 cup water	$\frac{3}{4}$ lb. to 1 lb.	.....	Same as peaches. Cook small pears in syrup.
Pears, Gingered (Kieffer pears)	Pare, remove cores and cut into small pieces.	To each pound use	None	$\frac{1}{2}$ lb. to $\frac{3}{4}$ lb.	1 or 2 pieces Ginger-root $\frac{1}{2}$ lemon finely sliced.	Combine sugar and fruit in alternate layers and allow to stand overnight to extract juice. Stir while heating slowly to boiling. Add the ginger and the lemon rind, which has been cooked until tender in a small quantity of water. Boil rapidly until somewhat thick, taking care to prevent scorching. When the fruit is clear, tender, and a rich amber color, fill into sterilized jars and seal.

Preserves—Continued

Fruit	Preparation	Proportions			Method
		Prepared fruit	Liquid	Sugar		Other ingredients
Plum, Damson.....	Prick.....	To each pound use	$\frac{1}{2}$ cup water	$\frac{3}{4}$ lb. to 1 lb.	Dissolve sugar in water and bring to boiling. Add plums, and boil gently until fruit is clear and tender. Fill into sterilized jars and seal.
Quince.....	Pare, cut into quarters and core....	To each pound use	$1\frac{1}{4}$ cups water	$\frac{3}{4}$ lb.	A very hard fruit may be cooked in water or steamed until tender. If cooked in water, use cooking water to prepare syrup. If steamed, put into a thin syrup. To make syrup, cook sugar and water about 3 minutes. Add fruit and boil 1 to $1\frac{1}{2}$ hours, until fruit is tender and somewhat clear. Pour into sterilized jars and seal.
Strawberry.....	Select large, solid, ripe fruit, wash and cap. Use small berries for juice.	To each pound selected berries use $\frac{1}{4}$ to $\frac{1}{2}$ lb. small berries crushed for juice.*	$\frac{1}{4}$ to $\frac{1}{2}$ cup fruit juice	$\frac{3}{4}$ lb.	Crush and cook the small berries for about 3 minutes while stirring. Strain. Add sugar to the juice, stir, and heat slowly until sugar is entirely dissolved. Drop large berries into syrup, simmer 3 to 5 minutes, then boil rapidly 10 to 15 minutes or until fruit is somewhat clear. Remove scum. Allow fruit to stand overnight in kettle. Fill sterilized jars with drained berries. Cook juice rapidly until fairly thick. Pour over the berries and seal.

*Other small, soft fruits may be preserved by this method.

Preserves—Concluded

Fruit	Preparation	Proportions				Method
		Prepared fruit	Liquid	Sugar	Other ingredients	
Strawberry sun preserves.	Same as strawberry	Same as strawberry	Same as strawberry	1 lb.	1 tsp. lemon juice.	(See above). After the 3 to 5 minute simmering period, drain the berries from the syrup and place about an inch apart on shallow enameled pans or china platters. Boil the syrup for about 10 minutes to a temperature of 221° F., or until it is fairly thick. Remove scum, add lemon juice, and pour syrup in a thin layer over the berries on pan or platter. Cover with window glass propped up about one-fourth inch from the plate. Place in sun for 2 or 3 days, or until syrup has formed a jelly. After each day's sunning, turn the berries over. Take in house at night. Without reheating, put jellied preserves into hot sterilized jars and seal.
Tomato preserves (yellow pear shaped)	Use with skins on or scald and remove skins.	To each pound use	$\frac{3}{4}$ cup water	$\frac{3}{4}$ lb.	$\frac{1}{4}$ lemon thinly sliced 1 piece ginger root.	Cook the lemon until tender in a portion of the water. Cook remainder of water with sugar to make a syrup. Add whole tomatoes, ginger root, lemon and liquid in which cooked. Boil until tomatoes are somewhat clear and syrup is somewhat thick. Remove scum, pour preserves into hot sterilized jars, and seal.
Watermelon	Use only the white part from rind. Cut into inch pieces. Soak for 3½ hours in lime water containing 1½ ounce lime to 1 quart water. Drain and place in clear water for 1 hour. Drain and boil for 1½ hours in fresh water. Drain.	To each pound before lime treatment use	2 qts. water	1 lb.	$\frac{1}{4}$ lemon thinly sliced spices or ginger root.	Make a syrup of the sugar and the 2 quarts of water. Drop watermelon rind and ginger root into the boiling syrup. Boil for about 1 hour. As the syrup thickens add lemon and spices, if desired. When somewhat thick, or a temperature of 220° F. has been reached, pack into sterilized jars, add syrup to cover, and seal.

Jams

Fruit	Preparation	Proportions				Method
		Prepared fruit	Liquid	Sugar	Other ingredients	
Apricot	Scald and remove skins. Cut into halves and remove stones.	To each pound use	None	$\frac{3}{4}$ lb.	2 table-spoons lemon juice.	Crush a portion of the fruit and heat to boiling with constant stirring. Add sugar and when dissolved add remaining fruit and cook rapidly until thickened to a jelly-like mass. Stir to prevent scorching. Add the lemon juice. Pour into hot sterilized jars, and seal.
Berries— Blackberries, Black raspberries	Remove caps	To each pound use	None	$\frac{3}{4}$ lb.	.....	Crush and heat the fruit. If the seeds are objectionable, put through a fine sieve to remove them. Add sugar, heat to boiling while stirring, and cook rapidly to the jelly test. Pour into hot sterilized jars, and seal.
Blueberries, Gooseberries, Loganberries, Red raspberries, Strawberries.	Remove caps or stems	To each pound use	None	$\frac{3}{4}$ lb. Gooseberries 1 lb.	.....	Proceed as for blackberries and black raspberries, except do not remove seeds. Cook rapidly about 30 minutes until jelly test is reached. Pour into hot sterilized jars, and seal.
Strawberry and rhubarb (equal weights)	Remove caps from strawberries. Cut rhubarb into inch pieces.	To each pound use	None	$\frac{3}{4}$ to 1 lb.	.....	Cover rhubarb with a portion of sugar and allow to stand an hour or two. Crush strawberries, mix with remaining sugar, then combine with rhubarb. Heat over a low flame until sugar is dissolved, then boil rapidly, stirring frequently to prevent burning. Cook about 30 minutes or until fairly thick. Pour into hot sterilized jars, and seal.

Jams—Concluded

Fruit	Preparation	Proportions				Method
		Prepared fruit	Liquid	Sugar	Other ingredients	
Cranberry.....	Sort and remove any that are speckled or soft. Peel oranges and remove seeds.	To each pound use	1 cup water	¾ lb.	1/8 teaspoon salt 1 orange ½ cup raisins.	Combine the fruits and chop. Add sugar, salt, and water and cook until thick, or about one-half hour. Pour into hot sterilized jelly glasses and cover with paraffin; or pour into hot sterilized jars, and seal.
Currant and red raspberry. (equal weights)	Remove currants from stems, and caps from raspberries.	To each pound use	None	¾ to 1 lb.	.....	Crush fruit, and stir while heating to boiling. Add sugar. Heat slowly until sugar is dissolved, then cook rapidly to jelly test. Stir to prevent scorching. Pour into hot sterilized jars, and seal.
Strawberry and pineapple. (equal weights)	Remove caps from berries, also skin and "eyes" from pineapple. Cut pineapple into cubes. Discard the core.	Weigh pineapple cubes. 2 lbs. straw-berries.	None	Same weight as pineapple. 1½ lbs.	.....	Place pineapple and an equal weight of sugar in a large pan over low heat. Stir until sugar is dissolved. Bring to a brisk boil and cook for 10 minutes with constant stirring. Add strawberries and sugar, and cook rapidly until somewhat thick. Pour into hot sterilized jars, and seal.
Peach, tart variety..	Pare and remove stones.....	To each pound use	None	¾ lb.	.....	Crush fruit and put down in layers with sugar until juice is extracted. Heat slowly to boiling while stirring. Then cook rapidly until somewhat thick. Pour into hot sterilized jars, and seal.
Plum, tart variety..	Prick.....	To each pound use	1 cup water	¾ lb.	.....	Cook plums in water until somewhat softened. Add sugar and continue to cook until fruit is very soft. Pour into hot sterilized jars, and seal.

Marmalades

Fruit	Preparation	Proportions				Method
		Prepared fruit	Liquid	Sugar	Other ingredients	
Orange, grapefruit, and lemon. (Amber marmalade)	Use one of each and select, yellow, smooth, thick-skinned fruit, free from blemishes. Remove peel and slice it very thin. Parboil it three times as follows: add 1 quart cold water, bring to boiling, cook for 5 minutes and discard water after each cooking. Cut the pulp into thin slices, removing seeds and "rag." Combine pulp and drained, parboiled peel.	.....	3 times weight or measure of fruit pulp, juice, and par-boiled peel. Boil this mixture rapidly 40 mins. before measuring for amount of sugar.	An equal weight or measure to the boiled fruit pulp, juice, and peel	A little salt	Boil the fruit mixture rapidly with added salt and sugar for 25 minutes, or until jelly stage is reached. If a thick marmalade is desired, boil longer, but watch carefully to prevent scorching. Let stand until slightly cool. Then stir to distribute fruit. Put into hot sterilized jelly glasses or pint jars. These quantities yield about 5 pints, or 12 or 14 glasses of marmalade.
Orange and lemon. (Sweet orange)	Select fruit and use equal parts. Prepare as described for Amber Marmalade.	.....	3 times weight or measure of fruit pulp, juice, and parboiled peel. Boil the mixture rapidly for 25 minutes before measuring for amount of sugar.	An equal weight or measure to boiled fruit pulp, juice, peel, and water.	A little salt	Boil the fruit mixture rapidly with added salt and sugar for 15 minutes, or until jelly stage is reached. Finish as for Amber Marmalade.

Marmalades—Concluded

Fruit	Preparation	Proportions			Method
		Prepared fruit	Liquid	Sugar		Other ingredients
Green tomato.....	Trim tomatoes, and cut in small pieces, or in medium or thick slices as preferred.	To each four pounds use	None	2 lbs.	<p>$\frac{1}{2}$ tsp. salt 1 lemon and 2 oranges or 5 lemons cut into very thin slices.</p> <p>Cook lemon and orange in a small quantity of water until tender. Mix all ingredients, stir, and heat slowly until sugar is dissolved. Boil until tomatoes are soft and the mixture somewhat thickened. Pour into hot sterilized jars, and seal.</p>

Conserves

Grape.....	Wash, drain, and remove grapes from stems. Slip off skins and keep separate from pulp. Remove seeds from orange and chop finely. Chop nuts fine.	To each pound use	None	$\frac{1}{2}$ lb.	<p>$\frac{1}{4}$ cup seedless raisins, $\frac{1}{4}$ orange, $\frac{1}{4}$ cup nuts, $\frac{1}{4}$ tsp. salt.</p> <p>Cook the pulp about 10 minutes, or until seeds show. Press through a sieve to remove seeds. To pulp add sugar, raisins, orange, and salt. Cook rapidly until mixture begins to thicken, stir to prevent sticking. Add grape skins and cook 10 minutes, or until somewhat thick. Stir in chopped nuts and pour at once into hot sterilized jelly glasses. Cover with melted paraffin.</p>
Rhubarb.....	Use only young, tender rhubarb. Wash, and cut fine without removing red skin. Remove seeds and chop fine the oranges and lemons. Blanch almonds and chop fine.	To each pound finely use	None	2 lbs.	<p>2 oranges, 2 lemons, 1 cup blanched almonds, $\frac{1}{4}$ tsp. salt.</p> <p>Combine all ingredients except nuts. Heat mixture slowly while stirring until sugar is dissolved. Boil rapidly until somewhat thick and clear. Stir in nuts, pour into hot sterilized jelly glasses and cover with paraffin.</p>

PECTIN EXTRACT

Home-made Apple Pectin Extract

Select firm apples such as the Ben Davis and Arkansas (Mammoth Black Twig). Summer apples do not have sufficient pectin for such use. Sound culls or apples with surface blemishes are usable. Scrub the apples and cut out the imperfect spots, then slice thin, retaining skins and cores.

For each 4 pounds of prepared apples use 4½ pints of water for the first extraction. Place the apples and the water in a large pan to allow rapid boiling. Cover and boil 20 minutes. Strain through four thicknesses of cheese-cloth until the juice stops dripping. Repeat the process, adding the same quantity of water and boiling and straining as before. The two extractions should amount to 3 quarts. Some workers recommend adding a little lemon juice to the water in order to increase the amount of pectin obtained.

Boil this juice in a pan large enough so that the liquid will be 2 inches deep. Boil rapidly until the juice is reduced to one-fourth its original volume. This usually requires from 30 to 40 minutes. There should be 1½ pints of the concentrated apple juice or pectin extract.

If the extract is not to be used at once, pour it while hot into hot sterilized half-pint jars, partially seal, process on a rack in a boiling water-bath for 20 minutes, complete the seal, and store in a cool dry place. Once the canned extract is opened, it must be used immediately because it will not keep.

CHERRY JELLY WITH ADDED APPLE PECTIN EXTRACT

2 pounds sour red cherries ½ cup apple pectin extract
 ½ cup water
 2 cups sugar

Wash the cherries thoroughly and remove the stems. Add the water to the cherries, boil for 10 minutes, and strain through a jelly bag. (This yields about 2 cups of juice.) Mix the 2 cups of juice with the sugar and the pectin extract. Cook until the jelly stage is reached and pour into hot sterilized glasses.

STRAWBERRY JELLY WITH ADDED APPLE PECTIN EXTRACT

2 pounds strawberries ⅔ cup apple pectin extract
 2 tablespoons water
 2 cups sugar

Wash the berries thoroughly and remove the caps. Add the water to the berries, boil rapidly for a few minutes until the berries are soft, and strain through a jelly bag. (This yields about 2 cups of juice.) Mix the 2 cups of strawberry juice with the sugar and the pectin extract. If the berries are especially lacking in acid, add 1 teaspoon lemon juice to each cup of the juice. Boil rapidly until the jelly stage is reached and pour into hot sterilized glasses.