

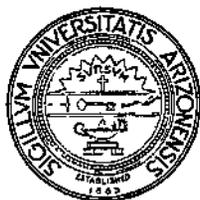
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University of Arizona

COLLEGE OF AGRICULTURE

AGRICULTURAL EXTENSION SERVICE

HOME PRESERVATION OF FOOD PRESERVATION OF FOODS WITH SUGAR



By
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College of Agriculture, Agricultural Extension Service

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HOME PRESERVATION OF FOOD

PRESERVATION OF FOODS WITH SUGAR

By

FRANCES L. BROWN AND OLIVE G. PICARD

INTRODUCTION

A well-planned preservation program for the utilization of surplus food products on the farm should include the making of preserves, jellies, marmalades, jams, and butters. With careful organization of the work and with the expenditure of very little time or money, the softer, overripe fruits may be easily converted into some one of these desirable foods. During the winter months the family will greatly enjoy the addition of these food accessories to the daily menu.

PRESERVING

In making preserves a large amount of sugar is combined with fruit, the heavy sirup thus formed acting as a preservative. When properly made the fruit in the preserves keeps its form, is plump, tender, clear, and of good color. The sirup should be clear also and thick enough so that the product will not be runny. The sirup upon cooling may become jelly. In making preserves honey may be substituted for one half the amount of sugar, if desired.

General Method

Prepare the fruit as for canning. Cook hard fruits such as pears and quinces in boiling water until partially tender. The general proportions of fruit, sugar, and water for preserving are one part fruit to three fourths to one part sugar, and one eighth to one half part water by weight. Make a sirup by boiling the sugar and water for five minutes. Cool the sirup before adding the fruit to prevent its shriveling and toughening. Add the small fruit or the partially cooked large fruit, a little at a time, and cook slowly until it is tender and clear.

When cooking is completed pour the preserves into hot, sterilized jars. Cover with melted paraffin, seal with sterilized covers, or pour into clean jars, cover, and process for one half hour at simmering temperature in water bath to preserve color, or for five minutes at 5 pounds pressure in pressure cooker.

Another Method

Prepare the fruit as for canning. Cook hard fruits such as pears or quinces in boiling water until partially tender. Weigh fruit

and sugar, using one part fruit to three fourths part sugar (use equal weights with more sour fruits and berries). Then put a layer of the fruit into a granite or aluminum kettle or pan, and over this a layer of sugar. Repeat until all of the fruit and sugar are used up. Let stand about twenty-four hours. Drain off the juice and put it on the stove. Let it come to a boil and boil for five minutes, then remove from the stove, pour over the fruit, and set away for about twenty-four hours again. On the second day strain off juice and repeat this process. On the third day strain off the juice and bring it to a boil. Then put in the fruit and let it boil for five minutes or until clear and tender. Remove from stove, pour into jars, and seal.

RECIPES FOR PRESERVES

Apple (Crab) Preserves

Select perfect, well-colored crab apples, wash thoroughly, remove blossom ends, leaving stems and skins. Place apples in a thick, boiling sirup made in the proportion of three parts sugar to one part water. Cook gently until tender (about thirty minutes). Pack hot into clean, hot, sterilized jars, cover with boiling sirup, and seal immediately. Crab apple preserves are superior in color, shape, and flavor to other preserves.

Cactus Preserves

Prepare 2 quarts of prickly pear cactus fruit by removing the skins, cutting in halves, and removing the seeds. Cook the cactus fruit until transparent in a sirup made of $1\frac{1}{2}$ cups sugar, $\frac{5}{8}$ cup water, $2\frac{1}{2}$ tablespoons lemon juice, and one slice orange $\frac{1}{4}$ inch thick cooked in the sirup but removed before packing preserves in jar. Seal as for any other preserves.

Cantaloupe Preserves

Remove the rind, cut firm pulp into desired pieces. Sugar down—alternate layers of sugar and melon, using the proportion of 1 pound fruit to $\frac{3}{4}$ pound sugar. Let stand twenty-four hours, add juice of one lemon, bring gently to a boil, and boil quickly until clear and tender—sirup gives sheet test. Cool rapidly, stand in sirup to plump. Fill jars, reheat sirup, pour into jars, and seal. Process if desired and store.

Cherry Preserves No. 1

Before pitting soak cherries in cold water two to four hours or overnight. Pit and weigh. Make up only 1 to 2 pounds of cherries into preserves at one time. Add sugar equal to one third the weight of the pitted cherries. Allow to stand covered in a cool place for two to four hours. Drain the cherries, add another one third weight of sugar to the juice, heat to boiling, add the cherries, and reheat until the mass just boils through. Let cherries stand covered in a cool place again for two to four hours or overnight. Repeat this process with the final one third weight of sugar.

Arrange to let the cherries stand overnight with one portion of sugar and from two to four hours with the other two portions. Boil rapidly until fruit is clear and sirup is of the proper consistency. If a thermometer is used finish preserves at 106 to 108 degrees C. (223 to 226 degrees F.). Let stand in kettle until cold, stirring frequently. Seal into sterile jars, keeping out from $\frac{1}{4}$ to $\frac{1}{2}$ cup of the sirup if the product has too much juice.

Cherry Preserves No. 2

Four pounds cherries, 3 pounds sugar, 1 cup cherry juice. Make a sirup of the sugar and fruit juice, cool, add seeded cherries, and cook rapidly until fruit is clear and sirup is of the proper consistency. If a thermometer is used finish cherry preserves at 106 to 108 degrees C. (223 to 226 degrees F.). Cool, pack into jars, and process as for other preserves.

Sour Orange Preserves

Cut or grate off the outer oil cells from the oranges. Cut in halves, squeeze out juice, being careful not to break the peel. Put the orange halves into an abundance of water and boil for ten minutes. Change to fresh water and boil again. Change water until as much of bitter flavor is removed as desired and fruit is tender. Drain and boil in a sirup made of one part sugar and one part water until fruit is transparent. As sirup boils down, add water to keep at original density. When transparent, cover, remove from stove, and allow to stand overnight. The next day add the juice previously removed from the fruit and cook again until sirup is somewhat thickened. Pack in hot, sterilized jars, strain the sirup over the fruit and process for ten minutes at simmering. Seal.

Peach Preserves

One pound peaches, 1 cup water, 2 cups sugar. Blanch, remove skins, and cut peaches into halves. Make a thick sirup, using two parts sugar to one part water. Cook peaches in the sirup until they are clear and the sirup is thick. Pack into hot, clean, sterilized jars and seal at once.

Pear Preserves

One pound pears, 2 cups sugar, 2 cups water, one lemon sliced thin. The fruit may be preserved whole, in halves, or in quarters. Boil sugar and water together for five minutes, add pears and sliced lemon, and cook until pears are clear and transparent and the sirup is thick. Pack into clean, hot, sterilized jars, cover with boiling sirup, and seal at once.

Plum Preserves

Six pounds fruit, 9 cups sugar, 1 cup water. Select small purple plums and be sure they are sound and not overripe. Remove stems, wash, and pierce each plum with a fork. Place plums in

an earthen bowl or jar, cover with sugar, and add water. Cover vessel and let stand in a cool place overnight. Drain plums and boil the juice for five minutes. Add plums and cook for a few minutes until clear. Take care not to overcook the fruit since the sirup thickens or jellies after standing. Pack into hot, clean, sterilized jars and seal immediately.

Quince and Apple Preserves

One pound fruit—quince and sweet apples, $1\frac{1}{2}$ cups sugar, water. Cook quinces until tender in about four times their measure of water. Pare sweet apples, cut them into medium thick slices, and cook in a small amount of water until tender. Drain off the juice from both apples and quinces, add sugar to the juice, and boil mixture for five minutes. Add fruit and boil mixture until it is thick and clear. Pack immediately into hot, sterilized jars and seal at once.

Strawberry or Soft Fruit Preserves (3-4-5-12 Method)

Three tablespoons lemon juice, 4 cups strawberries or other soft fruits, 5 cups sugar. Wash the berries carefully and shake off as much water as possible before hulling them. Remove imperfect berries. Place berries, sugar, and lemon juice in a wide-bottom granite or aluminum pan and bring to a boil as quickly as possible, keeping the mass moving in the pan by stirring with a silver fork as soon as the sugar begins to melt. When twelve minutes are up, the berries should be clear and plump. Pour the preserves immediately into hot, sterilized glasses and cover with hot paraffin, or allow them to stand overnight, then pour into glasses. If there is danger of mold, bring the preserves to a boil on the second day before filling the glasses. Standing all night in the sirup makes the berries somewhat plumper.

Strawberry Preserves

Two pounds berries, $1\frac{1}{2}$ pounds sugar, 1 cup berry juice. Pick over the fruit selecting firm, perfect berries. Slightly heat, crush, and strain the others to obtain the juice. Make a sirup of the sugar and juice, bring to the boiling point, remove from the stove, and cool before adding the berries. Add the berries a few at a time. Place again on the stove and heat slowly to boiling. Cook rapidly to 106 degrees C. (223 degrees F.). If a thermometer is not at hand, boil until berries are bright and transparent. Cool and pack cold in jars which have been previously boiled. Process at simmering temperature (87 degrees C. or 188 degrees F.) to give best results in color and flavor. For 12-ounce or pint jars at this temperature, process for one half hour. Other berries may be prepared the same way.

The following is a strawberry preserve recipe which makes a thicker sirup and is preferred by some people. There is also less sirup remaining after cooking.

One pound (3 cups) strawberries, $1\frac{1}{4}$ pounds ($2\frac{1}{2}$ cups) sugar. Put the berries in a colander or sieve and wash by pouring water

over them. Then stem them. Cover the berries with the sugar and let them stand two or three hours before cooking. Let simmer until the sugar is dissolved. Boil at 220 degrees F., or until the berries are clear and transparent (seven to fifteen minutes). Skim, cover, and let stand overnight. Pack cold into sterilized jars.

Watermelon Preserves

One watermelon, two lemons, sugar, spices. Peel and cut the rind of the watermelon into slices and soak slices in a weak salt solution (1 tablespoon salt to 1 quart water) overnight. Drain off the water and parboil the watermelon rind for a few minutes in water. Drain the slices again. Make a heavy sirup using three parts sugar to one part water, add two lemons sliced thin, and whatever spices are desired. Place watermelon in the boiling sirup and boil slowly until tender. Pack into clean, hot, sterilized jars, cover with boiling sirup, and seal immediately.

SCORE CARD FOR PRESERVES

	Per cent
Pack—full, attractive, practical.....	20
Liquid—clean, clear, heavy—may be a jelly.....	10
Color—natural, not faded or unnaturally bright but clear or with dull shine.....	20
Quality of products—pieces of fruit uniform in size, color, ripeness, consistency, keeping shape—not mashed or crushed.....	40
Appearance of container—clean, suitable, clear glass, neat label.....	10
Total	100

JELLY

Jelly is a form of preserves in which only the juice of the fruit is used. With this juice enough sugar is cooked to prevent spoilage from bacterial action, though it must be protected to keep out yeasts and molds. Because of the high sugar content, jelly is a concentrated food substance and should be eaten only in small quantities and then in combination with other foods like meat or bread and butter.

When properly made, jelly forms a most attractive dish—clear, sparkling, quivering in the light, yet keeping its shape as it is turned out of the container—and has the flavor of the fruit from which it was made. In judging jelly it is customary to take out a spoonful and cut it with another spoon or knife to see if it is tender and if it keeps an edge.

EQUIPMENT FOR JELLY MAKING

1. Large granite or aluminum saucepan or kettle (for cooking the fruit).

2. A wide, shallow pan or kettle of granite or aluminum (for boiling the jelly).
3. A colander or gauze sieve. A clean flour or sugar sack may be substituted (for extracting the juice).
4. A wooden paddle or spoon. A long granite or aluminum stirring spoon may be used.
5. Double cheesecloth or shaker flannel (for straining the juice before cooking. This is necessary if a clear, sparkling jelly is desired).
6. Glasses or jars with lids. Use either regular jelly glasses or glass jars. Sterilize them thoroughly in boiling water before using.
7. Old saucepan or can (for melting the paraffin).
8. It is not necessary to use paraffin if sterile lids are used and put on as soon as the boiling-hot jelly is poured into the container. It is the usual custom to put the lids on after the jelly has cooled, so for this reason it is better to use a thin layer of paraffin over the jelly and a lid merely to keep dust off the paraffin.
9. It is helpful in identification to label the jelly.

ESSENTIALS FOR SUCCESS IN JELLY MAKING

1. Fruit that has:
 - a. The right kind and amount of acid.
 - b. Sufficient pectin (this is the substance that makes jelly when heated with acid).
2. Sugar:

Either cane or beet sugar will do. Honey may be substituted for half the sugar if strong-flavored juices are used. It must be cooked beyond the usual jelly test, however, because of the extra moisture present.
3. Heat:

Enough to produce rapid boiling all over the pan or kettle.

If acid is not present or there is not enough of it, then acid must be supplied if jelly is to be made. Acid may be added in any of the following ways:

 1. By addition of juice of citrus fruit—lemons, oranges, or grapefruit.
 2. By the addition of some fruit juice such as the juice of sour apples, green grapes, plums, or rhubarb.
 3. By the addition of tartaric acid, but as this is a somewhat difficult matter it is not recommended.

If pectin is not present or there is not enough of it, it must be supplied and may be done as follows:

 1. By soaking white lining of peel of citrus fruit in water overnight, then boiling it a few minutes and using this liquid with which to cook the fruit that is to be used for jelly. (This is not a very practicable method as it is too much trouble.)
 2. By using juice from some fruit rich in pectin such as sour

apples, crab apples, green grapes, green gooseberries, or red currants. (Very practicable method.)

3. By using commercial pectin.

While good jelly can be made by supplying pectin to fruits lacking it, it is much more practical to confine jelly making to those fruits rich in both pectin and acid.

Apples, grapes, and currants are rich in pectin, while peaches and pears have little. There is more pectin in unripe than in ripe fruits, but the flavors of immature fruits are not so desirable for jelly. It is therefore recommended that the fruit be not too ripe or be not all ripe. Small fruits in which part (up to one fourth) are underripe make good jelly.

The presence of acid can be easily detected from the taste of the fruit, but it is not possible to tell by such a simple test if pectin is present.

ACID TESTS FOR JELLY MAKING

1. Mix 1 teaspoonful of lemon juice with 9 teaspoonfuls of water in a cup. Compare the taste of this with the juice to be tested. If the fruit juice is as sour as the diluted lemon juice, it will make satisfactory jelly. In tasting for acid disregard fruit flavor and concentrate on sourness.
2. The alcohol test for pectin may be modified for acid. Test the juice for pectin as described below. Then add to 1 cup of the juice, $\frac{1}{4}$ teaspoonful of lemon juice, or 5 per cent tartaric acid. Mix well. Repeat the alcohol test on this acidified juice. If this test is better than it was before, the juice needs more acid. In this case, to each pint of the juice used for jelly add $\frac{1}{2}$ teaspoonful of lemon juice or acid. If the test is worse or shows no change, acid will not improve the juice for jelly.

PECTIN TESTS FOR JELLY MAKING

Fruit juice must contain sufficient pectin in order to make jelly. If this pectin is absent no amount of cooking or care will make jelly from the juice. Therefore, the wise housewife will test her fruit juices to see if they contain enough pectin to make jelly.

Alcohol Test

When the juice for the jelly is hot, take 1 teaspoonful of the cooked and cooled juice and add to it 1 teaspoonful of alcohol. Let the two run together without stirring, and allow mixture to stand a few minutes. If the juice contains enough pectin to make jelly, a gelatinous substance similar to the whites of eggs will form that can be picked up with a spoon. If this does not form there is not sufficient pectin in the juice to make jelly. In order then to make jelly, pectin would have to be added.

Epsom Salts Test

Mix together 2 teaspoons of hot cooked fruit juice, 1 teaspoon sugar, and $\frac{1}{2}$ teaspoon Epsom salts. Stir until salts dissolve. Let

stand for twenty minutes. If fruit juice contains sufficient pectin to make jelly, the mixture will form into a gelatinous mass or large, flaky particles.

SUGAR TESTS FOR JELLY MAKING

In making pectin tests watch the amount of solidification in order to know how much sugar to use.

1. When most of the juice solidifies use 1 cup sugar to 1 cup juice.
2. When three fourths of the juice solidifies use $\frac{3}{4}$ cup sugar to 1 cup juice.
3. When one half of the juice solidifies use $\frac{1}{2}$ cup sugar to 1 cup juice.
4. When less than one half of the juice solidifies use added pectin or bottle the juice.

The following table may be referred to when making jelly from fruit juices lacking in acid, pectin, or both.

HOW TO MAKE JELLY FROM FRUIT JUICES LACKING IN ONE OR MORE ESSENTIALS*

Fruit juices	Deficiency	Necessary additions
Apple, sweet	Lacks acid	Add lemon or lemon juice or any fruit containing acid. Make acid test No. 1
Cherry	Lacks right kind of acid	Add equal quantities of sour apple juice
Elderberry	Lacks acid and pectin	Add equal quantities of sour or crab apple juice or homemade pectin and lemon juice
Peach	Lacks acid	Add lemon juice. Make acid test No. 1
Pear	Lacks acid	Same as for peach
Pineapple	Lacks pectin	Add equal quantities of sweet apple juice or one half the quantity of commercial pectin or homemade pectin
Rhubarb	Lacks pectin	Same as for pineapple
Strawberry	Lacks right kind of acid	Add equal quantities of sour apple juice

*Adapted from University of Illinois Extension Circular No. 37.

Apple Pectin

Pectin can be made at home for use in making jellies from such fruits as peaches, strawberries, cherries, etc. or those fruits that are lacking in pectin. One pound apple pulp (or skins and cores), 4 pounds or 4 pints water, juice of one lemon, boil for forty minutes. Press the juice through a cloth bag, then strain this juice through a flannel bag without pressure. Boil this juice fifteen minutes. Can in glass jars and use for jelly making.

CLASSIFICATION OF FRUITS ACCORDING TO SUITABILITY
FOR JELLY MAKING*

Fruits rich in acid and pectin	Fruits rich in pectin but deficient in acid	Fruits rich in acid but deficient in pectin	Fruits deficient in both acid and pectin
Sour apples, including crab apples	Figs (unripe)	Pomegranates	Raspberries (ripe)
Sour blackberries	Bananas (unripe)	Strawberries	Peaches
Cranberries	Apples, varieties of low acid	Rhubarb‡	Figs (ripe)
Currants (red)	Unripe pears	Vinifera (European) grapes	Overripe fruits
Gooseberries	Ripe quinces (some varieties)	Apricots (ripe)	
Quinces	Pie melon		
Eastern grapes	Sweet prunes		
Unripe grapes			
Sour varieties of guavas			
Grapefruit†			
Lemons			
Loganberries			
Sour oranges			
Plums (most varieties)			
Sour prunes			
Raspberries (if underripe)			

*W. V. Cruess and J. H. Irish, *Home Preparation of Jelly and Marmalade* (California Circular No. 2).

†Too bitter if used alone, should be mixed with other fruit.

‡Not a fruit but suitable for jelly making if pectin is supplied.

Good jellies can be easily made from the following fruits:

Apples (green)	Currants	Huckleberries
Apples (sour)	Cranberries	Loganberries
Crab apples	Grapes (green)	Loquats
Blackberries (sour)	Grapes (eastern)	Oranges (sour)
Blackberries (some unripe)	Grapes (some unripe)	Plums
Prunes (sour)	Quinces	Raspberries (some unripe)

Good jellies can be made from these combinations. Use equal weights or measures of the following fruits:

Mulberries and apples or apple pectin	Strawberries and apples or apple pectin
Elderberries and apples or apple pectin	Peaches and apples or apple pectin
Cranberries and apples or apple pectin	Fruit juice and apple pectin

STEPS IN JELLY MAKING

1. The first step in jelly making is to pick over the fruit and clean it, washing when possible and putting it on to cook, using as little water as necessary to prevent scorching.
 - a. For berries or soft fruits, only the water that adheres to the fruit will be needed when putting it on to cook, but care must be taken to prevent sticking or scorching.
 - b. For hard fruits like apples or quinces remove spots but do not peel or core. Cut up into pieces and cover with water when putting it on to cook. Put on lid and bring slowly to boil.
2. The second step is to extract the juice. This may be done by using a colander or sieve, or by running it through a bag that has been wrung out of hot water. If the bag is flannel or part flannel, the juice will not need to be strained again to make it clear.
3. If fruit is rich in pectin and acid, several extractions may be made by addition of more water and following step 1b.
4. After juice is strained, test for pectin and acid.
5. Measure juice and put it on to cook. Bring to a boil quickly and boil rapidly for about ten minutes. Skim, add sugar, and continue to boil rapidly in a wide shallow pan until done—that is, until the sirup jells or sheets off. It is better to make small rather than large quantities of juice and jelly. From 4 to 6 cups make an amount satisfactory for handling at one time. Do not fill the kettle more than half full.
6. When done pour boiling hot into clean, sterile containers.
7. Use paraffin:
 - a. Pour thin layer of hot melted paraffin on top of hot jelly as soon as it is poured into container.
 - b. Pour thin layer of hot melted paraffin upon jelly as soon as it has solidified in container.
 - c. Cut up cold paraffin in bottom of container and pour boiling jelly upon it. Hot jelly will melt the paraffin which will rise to the top and form a seal for the jelly.

If using a thermometer for making jelly, refer to the following table for the correct temperature at sea level and the corrected temperatures for elevations above sea level.

CORRECTED JELLY TEMPERATURES FOR DIFFERENT
ELEVATIONS ABOVE SEA LEVEL*

Elevation above sea level (feet)	Temperature at which jelly is finished	
	Centigrade (degrees)	Fahrenheit (degrees)
Sea level	103 —104	217 —219
500	102½—103½	216½—218
1,000	102 —103	215½—217

CORRECTED JELLY TEMPERATURES FOR DIFFERENT ELEVATIONS ABOVE SEA LEVEL*—Continued

Elevation above sea level (feet)	Temperature at which jelly is finished	
	Centigrade (degrees)	Fahrenheit (degrees)
1,500	101½—102½	214½—216½
2,000	101 —102	214 —215½
2,500	100½—101½	213 —215
3,000	100 —101	212 —214
3,500	99½—100½	211 —213
4,000	99 —100	210 —212
4,500	98½— 99½	209 —211
5,000	98 — 99	208 —210
6,000	97½— 98½	207 —209
7,000	97 — 98	206 —208
8,000	96½— 97½	205 —207

*West Virginia University Extension Circular No. 55.

TESTS FOR JELLY

Jelly is done when:

1. A teaspoonful of sirup quickly cooled jells or sets so it can be pushed back.
2. The sirup sheets from a metal spoon; that is, when the jelly moves from the spoon in a mass rather than in single streams.
3. The sirup drops from the edge of a metal spoon in two lingering drops at once, side by side.

JELLY FAILURES AND THEIR CAUSES

The following is a list of common jelly failures and their causes:

1. Mold or fermentation:
Containers not sterilized by boiling in water.
Careless handling of container after sterilization.
Imperfect seal or container.
Too little sugar.
2. Color dark; cloudy:
Juice squeezed rather than allowed to drip.
Juice not strained through thick cloths.
Overcooking.
3. Sugar crystals:
Too much sugar or too little acid or pectin.
Sugar added too near end of cooking process.
Imperfect seal.
4. Weeping:
Too much acid in proportion to pectin present.

5. Jelly soft:
Juice poor in pectin because too ripe or unsuitable for jelly making.
Too much sugar.
Insufficient cooking.
6. Jelly stiff:
Too little sugar.
Too high temperature.
7. Jelly tough and gummy:
Overcooked.
Too little acid.
8. Jelly sirupy:
Too much sugar.
Too little pectin (fruit too ripe or unsuitable).
Long, slow cooking (destroys pectin).

JELLY RECIPES

Apple Jelly

Apple jelly may be made from parings and cores of tart apples used in other canning. Discard all faulty parts. Cover well with water and cook until fruit is quite done. Strain twice. Add $\frac{3}{4}$ cup sugar to 1 cup of boiling juice. When it reaches the jelly stage skim and pour at once into hot jelly glasses or molds.

Apple-Mint Jelly

Two pounds apples, one bunch mint, 3 cups sugar, water. Wash and cut apples in quarters. Barely cover with boiling water, put on cover, and let cook until soft throughout. Turn into jelly bag to drain. Measure 1 quart juice, add leaves and stalk of mint; cook slowly twenty minutes, then strain into clean saucepan. Heat to boiling, add sugar, let boil till sirup jells. Tint with green vegetable coloring. Turn into hot jelly glasses.

Cactus and Apple Jelly

Boil 2 cups of cactus fruit juice and 1 cup apple juice vigorously. Skim, add a small quantity of commercial pectin, and skim again. Bring again to vigorous boiling point, add $2\frac{1}{4}$ cups sugar, boil for two minutes. Pour into jelly glasses and when cold, cover with hot paraffin.

Cactus Jelly

Boil $2\frac{1}{2}$ cups cactus fruit (prickly pear) juice vigorously. Skim, add one half package commercial pectin or "Pen-Jel" or $\frac{1}{4}$ cup Certo, and skim again. Bring again to a vigorous boil, add $1\frac{1}{2}$ cups sugar, and boil for two minutes. Pour into jelly glasses and when cold cover with hot paraffin. This jelly is a most beautiful shade of red.

Crab Apple Jelly

Same as apple.

Cranberry Jelly

One quart cranberries, 1 cup water, 2 cups sugar. Pick over and wash berries, add water, and cook in covered saucepan till soft. Strain through sieve or jelly bag. Add sugar to juice and boil from two to five minutes until two drops will form on edge of spoon and hang side by side. Pour into hot jelly glasses.

Grape Jelly

Wash the bunches thoroughly, remove the fruit from the stems, put the grapes into preserving kettle, add $\frac{1}{2}$ cup water to 2 quarts of grapes. Boil slowly until the grapes burst open and are soft enough to drain. Drain the juice through cheesecloth or cotton flannel bag. Measure the juice, bring to boil, skim, and add 1 cup sugar to each cup juice. Cook the sweetened juice rapidly in a porcelain kettle for about ten minutes or until a little of the juice hardens when cooled on a saucer. For green grape jelly the fruit should be gathered as soon as it begins to turn color.

Spiced Grape Jelly

Wash 2 gallons wild grapes, remove stems; put in preserving kettle with 1 quart vinegar, $\frac{1}{4}$ cup whole cloves, $\frac{1}{4}$ cup stick cinnamon, and cook until grapes are soft. Strain through double cheesecloth or jelly bag and boil liquid for twenty minutes. Add 6 pounds heated sugar, boil for five minutes, and turn into jelly glasses.

Grapefruit Jelly

After the peel has been removed, weigh out 1 pound of the fruit, cut into small pieces, place in a kettle, and for each pound of grapefruit taken add 2 pints of water. Boil until it thoroughly disintegrates. Pour into a flannel jelly bag and press until no more juice can be obtained. Drain this juice into a kettle and bring to a boil. Add $\frac{3}{4}$ pound of sugar for each pound of fruit taken. Continue boiling until the jelling point has been reached.

Orange (Sour) Jelly

Remove the peel from the oranges and weigh the remaining fruit. Cut into small pieces, place in a kettle and for each pound of orange taken add 2 pints of water. Boil until it thoroughly disintegrates. Pour into a flannel jelly bag and press until no more juice can be obtained. Strain this juice again through a clean flannel jelly bag without pressing. For each pound of fruit taken add to the juice 1 pound of sugar. Boil this until it reaches the jelling point.

Paradise Jelly

Twenty apples, ten quinces, 1 quart perfect cranberries. Cook fruit separately, mashing well and pressing through sieve and straining. Measure combined fruit juices; for each cup juice add 1 cup sugar, 1 cup orange juice, 1 tablespoon lemon juice, one stick

cinnamon. Cook rapidly till it drops in a sheet from spoon. Pour into hot jelly glasses.

Quince Jelly

Quinces have too little acid and too much pectin to make a desirable jelly when the juice alone is used. An equal amount or twice as much tart apple improves the flavor. Equal parts of cranberry, quince, and apple juice give a jelly of rich, red color and delicious flavor.

Cut the quinces into small pieces, do not pare, but remove the core and seeds, as they prevent the jelly from forming correctly. Add sufficient water to cover and cook until tender. Quinces require long cooking to become tender and to bring out their flavor and deep, rich color. Drain off juice. Use two thirds as much sugar as fruit juice. Follow general directions for making jelly. The pulp may be used for making conserve or butter.

SCORE CARD FOR JELLY

	Per cent
Pack—full, attractive, practical.....	10
Color—natural, characteristic of fruit used, sparkling, bright not dull, faded, or dark.....	20
Quality of product.....	40
Consistency—should hold shape and quiver, should cut easily.	
Clearness—transparent or translucent, not cloudy or con- taining crystals, pulp, or fiber.	
Condition—not weeping, moldy, or fermented.	
Tenderness—should cut easily and retain shape.	
Bloom or shine—should be sparkling or glistening.	
Flavor—natural, fruity.....	20
Appearance of container—clean, suitable, clear glass, with neat label.....	10
Total	100

JAMS, BUTTERS, MARMALADES, AND CONSERVES

DEFINITIONS

Jams, butters, marmalades, and conserves all belong to the class of fruit put up as preserves. All preserves have a high sugar content. They have enough sugar cooked into them to keep them from spoiling, provided they are kept airtight. These products are concentrated foods, economical, and if correctly made are very delicious and wholesome but should be used in small quantities. A thin covering of paraffin will keep them airtight.

In making preserves only good grades of fresh fruits that are sound and whole are used. High-grade preserves are cooked in a heavy solution of sugar (or part honey) in such a way that the whole fruit or pieces keep their shape and yet are tender, clear, and transparent or at least translucent; the heavy sirup or jelly surrounding the fruit should be clear and transparent.

In making jams, butters, conserves, and marmalades, while it is just as desirable to use fresh fruits, they need not be whole or sound, as unsound portions can be removed and the remainder used. Fresh fruits and berries that have been crushed, if clean, may be used.

Jam

A thick preserve in which the fruit, whole or in portions, has been literally jammed together; the consistency of a jam should allow it to spread and yet not be runny. It is permissible with blackberry, raspberry, or grape jam to have the seeds removed if desired.

Butter

A thick preserve that has been partially cooked and then put through a sieve or colander and further cooked until it is smooth and has the consistency of butter.

Conserve

A thick preserve resembling a marmalade, or it might be a jam which is made of a combination of fruits or a combination of fruits and nuts.

Marmalade

A marmalade is a thick preserve in which the fruit is divided into pieces with enough juice to keep it from mashing into a jam. Usually the juice of a marmalade is a jelly in consistency, and the portions of the fruit are imbedded in this clear jelly, e.g. orange marmalade. Marmalade, like jam, should be of a consistency that will spread and yet not be runny, though the juice need not be a jelly.

RECIPES

In making these preserves it is better to make up only a rather small quantity at a time and to use flat pans or kettles. They should be cooked quickly as a rule since long, slow cooking tends to darken the color and impair the flavor and texture. Constant attention and frequent stirring are necessary to prevent the mixtures from scorching or sticking. Jars and lids should be clean and sterilized if possible and the products as cooked poured boiling hot into the clean, hot jars and sealed at once.

In making up berries and small fruits if about one fourth of the product is slightly underripe, the finished product will have a more jellylike consistency. Sometimes in making these products, the juice formed by the first cooking is strained off for jelly making, and the jam or butter is made from the remainder. In general these products are made largely as preserves are made. A few sample recipes are given below.

Jams

Fig Jam

This can be made from the bruised and soft figs, by mashing the fruit well. Place figs in a little water, bring to a boil, measure fruit, add same amount of sugar as fruit, and cook for one hour, stirring to prevent burning. Pack hot jam into clean, hot jars and seal immediately.

Strawberry Jam

One pound strawberries, 1 pound sugar. Wash the berries, remove the hulls and all dark spots. Put them in a bowl and crush with a wooden spoon. Add sugar, heat quickly and cook rapidly until clear. It will require but a few minutes. Pour into clean, hot jars, seal. Avoid long cooking, as it is better to undercook the strawberry products a trifle than to overcook them, since the flavor, color, and consistency are changed by too much heat.

Butters

Apple Butter

Apple butter (without cider) is made as follows: Select tart apples, wash, slice, and weigh. Put in a kettle with enough water to cover and cook slowly until the apples are tender. Pass through a sieve to remove the seeds and skins. To each gallon of pulp add 1 pound of sugar (brown sugar is best) and cook until the mass when cooled is as thick as dairy butter. Stir often to prevent scorching. Test for thickness by cooling small amounts at frequent intervals after the mixture begins to thicken. Add spices to suit the taste when the cooking is done. About $\frac{1}{2}$ teaspoon each of cinnamon, cloves, and allspice may be used for each gallon. Pack into sterilized pint jars and process thirty minutes at simmering temperature.

Muskmelon Butter

Select ripe muskmelons. Cut in halves, remove rinds, seeds, and soft parts. Place the melons in a preserving kettle with as little water as possible and boil until tender. Press through a colander and measure the pulp. To each quart of pulp add $\frac{1}{2}$ cup sugar, juice of one half lemon, and a little cinnamon if desired. Continue boiling until mixture is thick enough to spread. Stir constantly to prevent burning. Pack hot butter into clean, hot jars. Seal immediately.

Peach Butter

Well-ripened freestone peaches are best to use. To peel the peaches dip in boiling water for a few seconds until the skin slips, put into cold water, and peel. Cook the peeled peaches with very little water until soft; put through a colander or sieve. To each

measure or pound of pulp add half a measure or $\frac{1}{2}$ pound of sugar. Cook slowly and stir frequently until the product is of the desired consistency. While still hot pack in sterilized jars and seal, or put in sterilized glasses and when cold cover with hot paraffin.

Plum Butter

Wash the plums, place them in a little water in a preserving kettle, and cook until soft. Then separate the skins and the pits by rubbing the pulp through a colander or a coarse wire sieve. In the case of large freestone plums it will probably be easier and quicker to dip the fruit into boiling water a few seconds until the skins crack, then dip into cold water so that the skins can be readily slipped off, the flesh split open, and the pits removed. If the plums are very juicy, the pulp put through a colander will be quite thin and should be boiled down to thicken it somewhat before the sugar is added. For each measure of pulp, whether put through a colander or not, use half to three fourths of a measure of sugar and cook slowly with frequent stirrings until the butter is as thick as desired. If a tart butter is favored, use less sugar. Add cinnamon, allspice, and cloves to suit the taste when the cooking is finished. Pack the plum butter hot into hot sterilized jars or glasses and then cover with hot paraffin, or else sterilize as directed for apple butter.

Marmalades

Amber Marmalade

One orange weighing about 7 ounces, one grapefruit weighing about 1 pound 3 ounces, one lemon weighing about 3 ounces. Select especially tender, clean, yellow, smooth-skinned fruit, free from blemishes. The thick-skinned varieties are better for this purpose than those having a thin, tough peel, since this thin peel is likely to become still tougher after cooking with sugar and acid. Wash the fruit well. Remove the skins and slice them very thin. Cook this peel in a quart of cold water three times for five minutes each, discarding the water after each boiling. Cut the fruit pulp into thin slices, removing the seeds and "rag," and combine this sliced pulp with the parboiled skins. To each weight or measure of fruit add three times its own weight or measure of water and boil for twenty-five minutes. Then add equal weight or measure of sugar and boil rapidly for another twenty-five minutes, or until the jelly stage is reached. Put at once into scalded jelly glasses, and when cold cover with paraffin.

Cactus-Apple Marmalade

Boil 2 cups chopped prickly pear cactus fruit pulp and 2 cups chopped apples together in 1 cup extracted cactus fruit juice until tender. Add 2 cups sugar and boil for fifteen minutes. Pour into jars and let cool.

Cactus-Lemon Marmalade

Cover $\frac{1}{4}$ cup lemon (thinly sliced) with water and let soak overnight. Add 1 cup cactus fruit pulp (prickly pear) thinly sliced, and $\frac{1}{2}$ cup sugar. Cook until it gives a satisfactory marmalade test.

Cactus-Orange Marmalade

Cut an orange into thin slices, then into quarters. Cover $\frac{1}{4}$ cup of these slices with water and let soak overnight. Add the juice of one half orange, 1 cup cactus fruit pulp (prickly pear) thinly sliced, and $\frac{3}{8}$ cup sugar. Cook until it gives a satisfactory marmalade test.

Cactus-Pineapple Marmalade

Combine $\frac{1}{4}$ cup pineapple cut in thin slices (across rings), 1 cup cactus fruit pulp (prickly pear) thinly sliced, $\frac{3}{8}$ cup sugar, and 1 to 2 tablespoons lemon juice (if desired). Cook until it gives a satisfactory marmalade test.

Carrot Marmalade

Two cups ground carrots cooked until tender, $1\frac{1}{2}$ cups sugar (two lemons, quartered and cut in thin slices, if desired), and 2 teaspoons ground ginger root. Cook slowly until thick. Do not stir. Pack into hot jars and sterilize.

Grape Marmalade

Select grapes, about one fourth or more of which are under-ripe, wash, and stem. Separate the pulp from the skins. Cook pulp for ten minutes and press it through a sieve or strainer to remove the seeds. Add $\frac{3}{4}$ cup of water to each quart of skins and boil until tender. Put the pulp and skins together and measure. For every quart of the mixture use 1 pound of sugar. Bring the fruit to a boil and add sugar, stirring frequently until it will give the jelly test, or reaches 222 degrees F. Pack into sterilized (pint) jars and process for thirty minutes at simmering point.

Sour Orange Marmalade

One pound peeled sour oranges, one third of peel removed from oranges, 2 pints water, $1\frac{1}{2}$ pounds sugar.

Preparation of Peel: Wash fruit, remove peel, discard two thirds of the peel, reserving the best third, and with a knife remove any blemishes that may be on the peel. Cut this peel in thin slices. Place in a kettle and add water (four times weight of peel). Boil for ten minutes, then drain. Repeat this process from three to five times, each time boiling the water for five minutes. Peel should be tender. Bitter taste may be removed by changing the water a sufficient number of times.

Preparation of the Juice: After the peel has been removed, weigh the remaining fruit, cut into small pieces, place in a kettle, and for each pound of orange taken add 2 pints of water. Boil until it

thoroughly disintegrates. Pour into a flannel jelly bag and press until no more juice can be obtained. Strain this juice again through a clean flannel jelly bag without pressing.

Making the Marmalade: Pour this juice into a kettle, add peel, and bring to a boil. Add 1½ pounds of sugar for each pound of fruit. Continue the boiling until the jelling point has been reached, which is indicated by the flaking or sheeting from a spoon.

When overripe oranges are used, the amount of sugar should be reduced to 1¼ pounds for each pound of fruit.

Sweet Orange Marmalade

One pound peeled sweet oranges, one fourth of peel removed from oranges, 2 pints water, ⅞ cup sugar.

Preparation of Peel: Wash fruit, remove one fourth of the peel, which should be free from blemish. Cut this peel in as thin slices as possible or run through a food chopper. Place in a kettle with an amount of water equal to four times its weight. Boil for ten minutes, drain free of water. Repeat this process twice, cooking in the last change of water until tender.

Preparation of Juice: After one fourth of the peel has been removed from the oranges, with a sharp knife remove the yellow part from the remaining peel leaving the white part containing pectin. Weigh the fruit, cut it into small pieces, place in a kettle, and for each pound of orange taken add 2 pints of water. Boil until it thoroughly disintegrates (about twenty minutes). Pour into a cheesecloth bag and press until no more juice can be obtained. Strain the juice again through a clean flannel bag without pressing.

Making the Marmalade: Pour the juice into a kettle and bring to a boil. For each pound of fruit taken add ⅞ cup of sugar. When this comes to a boil add the peel which has been sliced or run through a food chopper and cooked until tender. Bring the whole to a boil and continue boiling until the jelling point has been reached. (Usually obtained at 222 degrees F. or 106 degrees C.)

Grapefruit Marmalade No. 1

One pound grapefruit, 2 pints water, one third peel removed from grapefruit, 1 pound sugar (based on pectin test). This marmalade is made by following the same directions as for making sour orange marmalade.

Grapefruit Marmalade No. 2

Peel the grapefruit, remove and discard the white membranous skin that covers the pulp. Measure the pulp and for each cup of pulp add 1 cup of water and boil gently for twenty minutes. Cover and set aside until cold. Strain a small portion of the juice and test for pectin. If the pectin precipitate is very light, return the vessel to the stove and boil the contents for five minutes more. Cover and set aside until cold. Strain the juice through a jelly bag, pressing the fruit so as to obtain all the juice. Strain through a

second bag without pressing to remove particles of fruit from the juice. Test the juice so obtained for pectin and determine the amount of sugar to be used for each cup of juice that is taken. Bring the juice to a boil. Add the sugar and peel prepared as in Recipe No. 1. Boil until the mixture reaches the jelling point.

Lemon Marmalade

Cut firm, brightly colored lemons in very thin slices, discarding only the seeds. Allow one orange to each six lemons, cutting it also into very thin slices or use sliced kumquats instead of the orange. Measure the fruit and mix each quart of fruit with 3 quarts of cold water. Cover and let stand overnight. Next day boil rapidly until the fruit is tender; measure and add 1 cup sugar to each cup fruit. Heat slowly to boiling point, then boil rapidly until the mixture gives the jelly test. Pour into hot jars and seal.

Tomato Marmalade

One quart ripe tomatoes, $\frac{1}{2}$ cup cider vinegar, $\frac{1}{3}$ cup sugar, 1 teaspoon salt, 1 teaspoon mixed spices. To 1 quart ripe tomatoes, skinned and sliced, add $\frac{1}{2}$ cup cider vinegar, $\frac{1}{3}$ cup sugar, 1 teaspoon salt, and 1 teaspoon mixed spices. Cook mixture slowly until it is thick, stirring to prevent burning. Pack into clean, hot jars. Seal immediately.

Conserves

Cactus-Date Conserve

Take 2 cups cactus fruit (prickly pear) thinly sliced, one half box dates ($1\frac{1}{2}$ dozen) stoned and cut in pieces, one orange with the juice and grated rind, two thin slices of pineapple, 4 teaspoons lemon juice, $\frac{1}{2}$ cup pineapple juice, and $1\frac{1}{2}$ cups sugar. Cook slowly until of desired consistency for conserve. Five minutes before removing from stove add $\frac{1}{2}$ cup walnut meats broken in pieces.

Cactus-Date Conserve with Rhubarb

Take 1 cup cactus fruit (prickly pear) thinly sliced, 1 cup rhubarb cut in pieces, two thin slices of pineapple, $\frac{1}{2}$ cup pineapple juice, $1\frac{1}{2}$ cups sugar, one half orange (juice and grated rind), and one half box dates ($1\frac{1}{2}$ dozen) stoned and cut in pieces. Cook slowly until of desired consistency for conserve. Five minutes before removing from stove add $\frac{1}{2}$ cup walnut meats, broken in pieces.

Damson Plum Conserve

Two pounds Damson plums, 1 cup English walnuts, one lemon—juice and grated rind, 1 pound seedless raisins, and 3 cups sugar. Wash raisins. Remove seeds from the plums and weigh the fruit. Add sugar, lemon, and raisins. Cook mixture until it is thick and clear. Pour boiling water over nuts and let stand for two minutes. Drain water from nuts, cut or chop them, and add to

mixture just before removing conserve from stove. Pour conserve into clean, hot jars and seal at once.

Grape Conserve

Five pounds blue grapes, two medium-sized oranges, 1 pound raisins, 4 pounds sugar, $\frac{1}{2}$ pound walnut meats coarsely cut. Pick over grapes. Wash and separate skins from pulp. Put the skins in a saucepan with water to cover and boil until tender. Boil the pulp for five minutes and rub through a sieve to remove seeds. Wash oranges and put them and the raisins through the coarse knife of the food chopper. Add 1 pint water and boil rapidly for one half hour or until the orange is tender. Add sugar heated and boil to marmalade consistency. Add nut meats just before removing from stove. Seal in sterilized jars.

Rhubarb and Apple Conserve

Two cups sugar, $\frac{2}{3}$ cup water, 2 cups rhubarb cut in small pieces, 1 cup sliced apples, $\frac{2}{3}$ cup chopped English walnuts. Make a sirup of sugar and water and when boiling add fruit and simmer until mixture is thick and clear. Add nuts and pack conserve into clean, hot jars and seal immediately.

Tomato Conserve

One quart tomatoes, fresh or canned (drain off juice), 1 cup seedless raisins, one lemon cut in small pieces, $\frac{1}{2}$ cup English walnuts, 4 cups sugar. Wash raisins. Blanch, peel, and core fresh tomatoes. Mix ingredients, except nuts, and cook mixture until it is thick and clear. Add finely chopped nuts and pour mixture into clean, hot jars and seal at once.

SCORE CARD FOR JAMS, BUTTERS, MARMALADES, AND CONSERVES

	Per cent
Pack—full, attractive, practical.....	20
Color—clear, natural, not faded, browned, or darkened, or unnaturally bright.....	20
Juice or liquid—clean, clear, heavy, may be a jelly.....	10
Consistency and texture—uniform, smooth, clear, translucent..	40
Appearance of container—clean, suitable, clear glass, neat label	10
Total	100

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