

CANNING Project for 4-H Clubs

UNIT VI



JELLIES, JAMS and MARMALADES

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UNITS IN THE CANNING PROJECT

Seven units are available to 4-H Club girls who wish to take the canning project. It is best to take the first 3 in the order given. Keep a record, using the 4-H Canning Record Book.

Unit I.....Fruits and Fruit Juices

Unit II.....Tomatoes and Tomato Juice

Unit III.....Vegetables

Unit IV.....Meats (Use U. S. Dept. of Agriculture AW 1-110)

In the meat unit can—

5 quarts chicken

5 quarts pork

5 quarts meat (other than pork or chicken) if available

30 quarts fruits and vegetables

Unit V.....Relishes and Pickles

Unit VI.....Jellies, Jams, and Marmalades

Unit VII.....Canning Budget

Help plan and can the budget for the family.

Can at least a budget for one person (100 jars).

Use budget plan in Canning Record Book.

Use the above circulars for canning directions.

A 4-H Canning Record Book is available for keeping a record in any unit.

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4-H Club Canning Project

UNIT VI—JELLIES, JAMS AND MARMALADES

By Dorothy Gentry and Edith Lacy¹

FRUIT SWEETS, such as jams, jellies, preserves, marmalades, conserves, and butters serve various purposes in the menu. They can be used to tempt the appetite, give zest to bland foods, change left-over desserts, or supply the dessert for an emergency meal. As they contain much sugar they are an excellent source of energy and should be used as part of the sugar allowance for the day.

WHAT TO DO IN UNIT VI

1. Make 20 jars or glasses of jam, jelly, preserves, or marmalade, including at least 4 varieties.
2. Label each jar or glass. Use regular club labels for county, district, and state exhibits. For home storage use homemade labels, giving name of product and date when made.
3. Can at least 35 quarts of fruits, vegetables, and meats and 5 pints of pickles or relish as a review of methods learned in other units.
4. Give a demonstration on making jelly, jam, preserves or marmalade.
5. Exhibit your products at community and county fairs, if held.
6. Keep a complete record in the 4-H Canning Record Book.

JELLY

Jelly is made by combining fruit juice and sugar in the right proportions and cooking until the mixture will jell when cooled. It should be clear, sparkling, and free from sediment or crystals, with the natural color and flavor of the fresh fruit. When turned from the glass it should hold its shape and quiver. When cut, the edges should be sharp and the jelly should not cling to the knife.

Selecting Fruit

For jelly, select some slightly underripe and some well ripened fruit. This assures both a supply of pectin and a good flavor to the jelly. Pectin, a natural substance of green fruits, undergoes a chemical change as the fruit ripens and sugar is formed; therefore the fruit for supplying pectin should be selected before this stage is reached. On the other hand some well-ripened fruit will give a delicious flavor and depth of color

¹Instructions and recipes in this circular are based on Circular 302 (now out of print), by Florence Imlay and Pearl J. Haak.

to the jelly. Club girls may use $\frac{1}{4}$ to $\frac{1}{2}$ slightly underripe fruit and $\frac{1}{2}$ to $\frac{3}{4}$ well-ripened fruit.

Preparing the Fruit

Wash fruit and remove stems or blossom ends. Quarter apples, leaving skin and core. When using other hard fruits cut them in small pieces. Crush soft, juicy fruits in a kettle and add 1 cup of water to 2 or 3 quarts of fruit. Cut the less juicy fruits into small pieces, leaving skins, seeds, and cores. Put into a kettle and cover with water and a lid. Bring the mixture slowly to boiling and cook until tender. Cook soft fruits 2 or 3 minutes—no longer.

Extracting the Juice

Remove juice from the stove and drain it through a heavy muslin or flannel bag or several layers of cheesecloth. Don't squeeze it in straining. To make a second extraction cover the fruit pulp with water, bring to boiling and drain as before. The juice from the first extraction will make a better quality jelly. However, a satisfactory product can be made by mixing the first and second together.

The fruit juice for jelly-making must contain pectin and acid in the right proportions. Some fruits contain plenty of both while others lack one or the other, or both. Some of the common fruits are grouped below according to the amounts of pectin and acid they usually contain.

Rich in acid and pectin	Rich in pectin but low in acid	Rich in acid but low in pectin	Low in both acid and pectin
Sour apples	Sweet apples	Cherries	Raspberries
Crabapples	Quinces	Pineapples	Elderberries
Cranberries	Pears	Strawberries	Peaches
Gooseberries			Over-ripe fruits
Grapes			
Loganberries			
Sour blackberries			
Plums			
Currants			

There is, however, some variation in pectin and acid content of the same kind of fruit juice and it is therefore well to test the juice for both acid and pectin before attempting to make jelly.

Test for Acid

If the fruit juice has a decided tart or acid taste, it usually contains enough acid to make it jell. But if you are not quite sure that it is tart enough, make a solution by mixing 1 teaspoon of lemon juice, 3 table-spoons of water and $\frac{1}{2}$ teaspoon of sugar, and compare with the fruit juice. If the fruit juice tastes about as sour as the lemon mixture, it contains enough acid to make jelly. If the juice is less acid to the taste, add an equal quantity of a tart fruit juice, or a few slices of lemon, or a small quantity of lemon juice.

Pectin Test

Pour 2 or 3 tablespoons of cooked fruit juice into a small glass and add an equal amount of alcohol (denatured). If the fruit juice is rich in pectin a solid jelly-like mass or clot will quickly form. If the juice is only moderately rich, several small particles of jelly-like material will form. If the juice contains little or no pectin, only a few tiny flaky pieces will form.

Homemade Pectin Concentrate

A concentrated apple pectin solution may be made at home by following these directions.

Wash 4 pounds of firm, tart apples; remove the blossom end, and slice. Add 2 quarts of water and juice of 2 lemons. Boil 20 minutes. Strain mixture through jelly bag, without squeezing. Boil again rapidly until reduced to about 1½ pints. Pour into hot sterilized jars and seal with sterilized tops. To make jelly from fruit juice lacking in pectin, use 1 cup concentrated apple pectin to 3 to 4 cups of fruit juice.

Adding the Sugar

Boil the juice rapidly until it is reduced to about half and then slowly add the sugar. The amount of sugar to use is determined by the pectin and acid content of the juice. If a juice gives a satisfactory alcohol test for pectin, add sugar equal to the amount of juice. If a juice contains little acid, use $\frac{3}{4}$ cup of sugar to every cup of juice.

When to Add Sugar

Jelly has a better flavor and color if surplus water is evaporated from the juice before the sugar is added. If water was added to the fruit to extract the juice, boil the juice rapidly until about the same amount of water is evaporated. Then add the sugar slowly to the boiling juice.

Amount to Cook

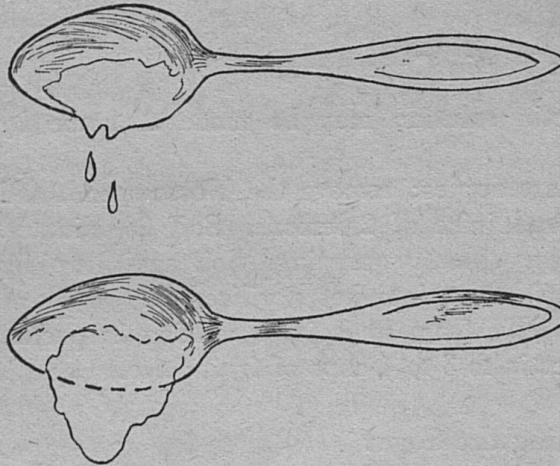
Cook not more than 3 or 4 cups at a time for jelly of best quality. Use a kettle which will hold at least 4 times as much as the amount of juice to be cooked. The juice can then be boiled rapidly without danger of boiling over. Slow cooking causes jelly to be strong flavored, dark, and gummy.

How Long to Cook

Juice of the proper acid and pectin content should be ready to jell with 5 to 15 minutes cooking after the sugar is added. If it boils less than 5 minutes after the sugar is added, the sugar may not be fully dissolved and crystals may form after the jelly has stood for a few weeks.

On the other hand, if the sugar and juice cook together too long, the sugar tends to caramelize and the jelly is darkened and strong-flavored. Simmering the juice causes a dark strong-flavored jelly.

How to Tell When Jelly Is Done



The "sheet test" for telling when jelly is done is accurate and easy to make. Take a little juice in a spoon, cool it slightly, and pour it from the side of the spoon. When the drops run together and drop off the side of the spoon in a sheet, as in the lower illustration, the jelly is done and should be taken from the stove. If a thermometer is used, the temperature will be 217 to 221 degrees F.

Filling the Glasses

After taking the jelly off the stove, strain and pour it into hot, sterilized glasses. Hold the pan only 1 or 2 inches above the glass when pouring, so that air will not be carried into the jelly. Air bubbles tend to make the jelly cloudy and foggy.

Covering and Labeling

When the jelly is thoroughly cooled, pour melted paraffin over the top. Be sure that the entire surface is coated. Then wash the outside of the jelly glass thoroughly and cover. Write the date and kind of jelly on the label and stick it on the glass $\frac{1}{4}$ inch from the bottom. Store the jar of jelly in a cool dry place.

Causes of Some Common Difficulties in Making Jelly

1. Soft jelly

Not enough pectin or acid due to use of the wrong kind of fruit or over-ripe fruit.

Too much sugar.

Too little cooking of juice.

Long, slow cooking of juice.

2. Tough, gummy jelly
Too little sugar.
Cooking too long.
3. Cloudy jelly
Wrong method of extracting the juice.
Use of green fruit, such as apples, which contain starch.
Pouring jelly into glasses from too great a distance above glass.
Too much pectin in the juice.
Allowing jelly to cool before filling glasses.
4. Dark, strong-flavored jelly
Cooking juice too long.
Cooking too much juice at a time.
5. Crystals in jelly
Too much sugar.
Not enough cooking after sugar is added.
6. Fermented jelly
Glasses not well sterilized.
Not enough cooking.
Glasses not well sealed.
Storing in a warm place.
7. Moldy jelly
Glasses not well sterilized.
Paraffin not hot enough to sterilize top of jelly.

Jelly Recipes

Apple jelly.—Wash and quarter crab or sour apples without paring or removing the core. Put into a kettle and add half as much water as fruit. Cover, and cook slowly to extract as much of the juice as possible. Strain the juice and, if desired, make a second extraction and add to the first. If the juice makes a good pectin test use $\frac{3}{4}$ cup sugar to a cup of juice. Boil the juice 3 to 5 minutes to evaporate some of the water. Then add the sugar gradually to the juice and boil rapidly until the temperature of the mixture reaches 217° to 221° F or until the juice meets the sheet test. Skim and pour into hot sterilized glasses. Cool; cover with melted paraffin; label; and store in a cool dry place.

Currant, plum, and gooseberry jellies may be made by following the same general directions as for apple jelly.

Blackberry jelly.—Select about $\frac{1}{2}$ blackberries which are red or slightly underripe and $\frac{1}{2}$ fully ripe. Wash and put into a large kettle. Add about one cup of water to three quarts of berries, bring slowly to boiling, and boil about 5 minutes. Strain through a wet flannel, heavy muslin bag, or several layers of cheesecloth. Test the juice for pectin. Measure the number of cups of juice; this will determine how much sugar to add later. Pour juice into a kettle. Boil the juice rapidly 3 to 5 minutes to evaporate some of the surplus water, then add $\frac{1}{2}$ to $\frac{2}{3}$ cup of sugar per cup of unevaporated juice, according to the pectin test. Boil rapidly until the temperature reaches 217° to 221° F, or until the juice meets the sheet test. Pour into hot, sterilized glasses. When cool, cover with melted paraffin, label, and store in a cool, dry place.

Raspberry, loganberry, and dewberry jelly can be made by using the same general directions as for blackberry jelly.

Grape jelly.—Choose slightly underripe grapes; take them from stems, and wash. Put into a kettle and add 1 cup water to 2 quarts grapes. Boil slowly about 8 minutes. Strain through a jelly bag, and test juice for pectin. Measure the number of cups of juice, pour into kettle, and boil rapidly about 3 to 5 minutes to evaporate some of the surplus water. Add $\frac{3}{4}$ to 1 cup sugar per cup of unevaporated juice, according to the pectin test. Boil rapidly until the temperature reaches 217° to 221° F or until the mixture meets the sheet test. Strain, pour into hot, sterilized glasses, cool, cover with melted paraffin, label, and store in a cool, dry place.

Crystals can be prevented from forming in grape jelly by using about $\frac{1}{2}$ apple juice and $\frac{1}{2}$ grape juice.

Mint Jelly.—Wash and chop fine 2 cups of mint leaves. Add $\frac{1}{2}$ cup water and $\frac{1}{2}$ cup sugar and allow to stand several hours. Bring to boiling point and strain. Make apple jelly according to directions, add green vegetable coloring to give a bright color and 1 to 2 tablespoons of the prepared mint juice to each quart of apple jelly a few minutes before removing the jelly from the flame. Skim and pour into hot, sterilized glasses. Cool, cover with paraffin, label, and store in a dry, cool place.

PRESERVES

Preserves are made by cooking whole small fruits or small pieces of large fruits in a sirup of water and sugar until the fruits or pieces of fruits are clear and somewhat translucent and filled with a heavy sirup. ("Translucent" means that they let light shine through them.) Good preserves hold the original color, shape, and size of the fruit.

Select fruit for preserving that is firm-ripe rather than soft-ripe. Cut in uniform pieces for even cooking. Cook berries and soft and acid fruits in a thick sirup made by using $\frac{1}{2}$ cup water to 2 cups sugar. Cook heavier fruits such as peaches, pears, and watermelon in a thin sirup made with 1 cup water to every $1\frac{1}{2}$ cups sugar. Don't make more than 2 quarts of preserves at a time.

When the fruit is tender, remove it from the stove and cool quickly for better flavored preserves. Let the fruit stand in the sirup in a shallow pan for 7 to 12 hours. Remove the fruit from the sirup and pack in hot sterilized jars. Heat the sirup to boiling and pour over the fruit to fill the jars. If the sirup is too thin boil it rapidly to the desired consistency before pouring over the fruit. Remove air bubbles from the jars with a small wooden spoon or paddle. Put jars of preserves in water and simmer for 30 minutes. Upon removing the jars, seal with sterilized tops, label the jars, giving the date and kind of preserves. Store in a cool, dry place.

Recipes for Preserves

Cherry preserves.—Wash the cherries. Remove stems and pits, saving the juice to use in making the sirup. Place cherries in a shallow pan and cover with medium thick sirup made with 1 cup sugar to 1 cup cherry juice or water. Boil slowly for 10 minutes; remove from the stove and let stand in the pan 7 to 12 hours. Drain the juice from the fruit and pack the cherries in clean, hot, sterilized jars. Boil the sirup until it reaches 218° to 224° F, then pour the boiling sirup over the cherries to fill the jars. Partially seal and process in a water bath (212° F) 15 to 20 minutes. Seal and store in a cool, dry place.

Peach preserves

2 lb peaches		4 c sugar
	2 c hot water	

Scald peaches, remove skins and seeds, and slice or cut in quarters. Make a very thick sirup, using 4 cups sugar to 2 cups water. Cook the peaches in the sirup until they are clear. Remove the peaches from the sirup and boil sirup 5 to 10 minutes longer. Place peaches in a shallow pan, pour the sirup over them and allow to stand over night or for several hours. Remove fruit and boil the sirup until it reaches 218° to 224° F, and pour over the peaches. Fill hot sterilized jars, partially seal, process in a water bath (212° F) 15 to 20 minutes, completely seal, and store in a cool, dry place.

Pear preserves

2 lb pears	2 c sugar
1 lemon	6 c water

Wash and peel pears, removing stems and blossom ends. Cut in quarters and drop into 4 cups water to which 1 tablespoon salt has been added. Make a sirup by boiling the sugar and the two remaining cups of water together for 3 to 5 minutes. Add pears and sliced lemon to the sirup and cook until the pears are clear and somewhat translucent. Remove the pears and place in a shallow pan. Cook the sirup until thick, pour over fruit, and allow to stand for several hours. Remove fruit and boil sirup until it reaches 218° to 224° F, and pour over the fruit, fill hot, sterilized jars, partially seal, process in a water bath (212° F) 15 to 20 minutes, completely seal, and store in a cool, dry place.

Damson plum preserves

3 qt plums

1 c sugar

1 c water

Select plums which are slightly underripe. Wash, remove stems and pierce. Make a sirup of the sugar and water, add plums, and cook until the fruit is tender and clear. Pour into shallow pans and let stand for several hours. Reheat the sirup and boil until it reaches 218° to 224° F, and pour over the fruit. Fill hot, sterilized jars, partially seal, process in a water bath (212° F) 15 to 20 minutes, completely seal, and store in a cool, dry place.

Strawberry preserves

1½ qt prepared berries

2½ c sugar

Cover the bottom of a pan with half the sugar. Pour in the berries and cover with the remaining sugar. Let the mixture stand all night. Place the pan over a slow fire and heat slowly until all the sugar is dissolved, stirring carefully to prevent scorching. Boil rapidly 2 minutes, stirring carefully to avoid crushing the berries. Remove from the fire, pour into a shallow pan, cover with a clean piece of glass, and set in a sunny place for 2 or 3 days, or until the berries are plump and the sirup thick. Stir frequently during these 2 or 3 days. Pack into hot, sterilized jars, partially seal, and process 20 to 30 minutes in a water bath (212° F). Completely seal and store in a cool, dry place.

Watermelon rind preserves.—Using only the white part from the rind, cut into 1-inch pieces, and weigh. Soak for 3½ hours in lime water made by adding 1/5 oz lime to 1 qt water. Drain and place the rind in clear water for 1 hour. Drain and boil for 1½ hours in fresh water. Drain. Make sirup of 2 quarts of water, 2 cups of sugar, and ½ lemon thinly sliced for every pound of rind weighed before the lime water treatment. Drop the watermelon rind into the boiling sirup and boil for about 1 hour. As sirup thickens, add lemon and spices, if desired. When thick or at temperature of 220° F remove from fire and let stand over night. Pack pieces of fruit in sterilized jars, reheat sirup to boiling, pour

over fruit, partially seal, and process 15 to 20 minutes, completely seal, and store in a cool place.

JAMS AND FRUIT BUTTERS

Jam is made from whole fruit so prepared as to make a smooth mixture. The fruit is broken by stirring during cooking. The natural color should be preserved as nearly as possible, and seeds should be left in most berries and small fruits. Jam should be jellied and tender. When placed in a dish it should not spread or flatten.

Fruit butter is smoother than jam and usually should be pressed through a sieve or colander. Seeds and skins should be taken out. A good fruit butter is jelly-like, firm enough to slice, but also soft enough to spread evenly.

How to Make Jam and Butter

Cook the fruit until it begins to thicken or the surplus water evaporates. Add slowly to the boiling mixture $\frac{1}{2}$ to $\frac{3}{4}$ pound of sugar to 1 pound of fruit, or $\frac{1}{2}$ to 1 cup sugar per cup of fruit, depending on the amount of pectin in the fruit. Stir until the sugar is entirely dissolved, and cook rapidly, stirring frequently. Test by cooling a little of the mixture. If it keeps its shape, it is done. Remove from the stove, pour into hot, sterilized jars, and seal with sterilized tops, or pour into hot glasses and cover with hot paraffin when cool. Store in a cool, dark, dry place.

Butter and Jam Recipes

Apple butter

7 lb good cooking apples
(20 to 21 medium sized apples)
 $2\frac{1}{2}$ c sugar
4 qt cider

1 t ground allspice
 $1\frac{1}{2}$ T ground cinnamon
1 t ground cloves

Wash and slice the apples leaving skins and seeds. Add the cider and cook until the apples are very tender. Remove the skins and seed by pressing the fruit through a sieve. Add the sugar and spices to the pulp and cook until thick and clear, stirring frequently to prevent burning. Pour into sterilized jars, cool and cover with paraffin. Store in a cool place.

Plum butter.—Wash the plums, put them into a kettle and cover with water. Cook slowly until the plums are soft. Rub the plums through a sieve and measure the pulp. Add $\frac{1}{2}$ to $\frac{2}{3}$ cup of sugar per cup of pulp. Cook slowly until thick and clear. Remove from stove, pour into hot, sterilized jars, and seal.

Grape butter.—Wash the grapes, remove the stems and separate pulp from skins. Place in pan, add only enough water to keep the grapes from scorching, and heat to boiling. Cook until the grapes are soft. Rub through a sieve. Add $\frac{1}{2}$ cup of sugar per cup of pulp. Cook slowly for about 20 minutes, or until desired consistency is reached. Test by removing pan from stove and cooling a sample. Pour into hot, sterilized jars and seal. One cup wild grape juice and pulp added to 1 to $1\frac{1}{2}$ quarts of cultivated grape juice and pulp gives a delightful flavor.

Blackberry jam.—Wash the berries, place in pan and heat slowly until some juice is extracted. Cook until the berries are thoroughly softened. Measure the pulp and liquid together, and for every pint add 1 cup of sugar. Cook rapidly until thick, stirring to prevent burning. Pour into hot, sterilized jars, cool, cover with paraffin and store.

MARMALADES AND CONSERVES

Marmalades are usually made with citrus fruit or in combination with other fruits or vegetables and are similar to preserves. Conserves are a combination of several fruits with nuts and raisins or both added to the mixture. The ingredients are cooked with sugar until the mixture is jelly-like.

Orange-lemon marmalade

6 oranges
2 lemons

Sugar
 $1\frac{1}{2}$ qt water

Wash oranges and lemons and cut in thin slices. Cover with water and let stand over night. Cook slowly until the fruit is tender. Measure, add an equal amount of sugar, and cook. Test the marmalade by giving it the jelly sheet test. Pour into hot, sterilized jars, seal with sterilized tops, and store.

Orange-carrot marmalade

3 carrots
2 oranges
Juice from 3 lemons

4 c sugar
1 c water
 $\frac{1}{2}$ t salt

Wash and scrape the carrots and put through a food chopper, using a medium blade. Steam until tender. Wash and peel the oranges. Cut orange peeling into small pieces and boil in water until tender. Add the steamed carrots, sugar, lemon juice, and salt to the orange mixture and cook until the fruit is clear and the sirup meets the jelly sheet test. Pour into hot, sterilized jars, seal with sterilized tops, and store in a cool, dry place.

Grape conserve

2 lb grapes	$\frac{1}{4}$ c raisins
1 orange	$\frac{1}{4}$ c nuts
2 c sugar	1 c water

Wash the grapes, remove from the stems, and separate the pulp from the skins. Cook the pulp slowly until some of the seeds are loosened. Rub through a colander. Add 1 cup of water to the skins and cook until tender. Squeeze the orange and put the rind through a food chopper. Mix together the orange juice, rind of orange, raisins, cooked pulp, and skins of grape. Boil until quite thick. Add the sugar and cook until mixture nearly meets the sheet test. Add nuts, remove from stove, and pour into hot, sterilized jars. Seal with sterilized tops, and store in cool, dry place.

Rhubarb conserve

2 lb rhubarb	1 orange
5 c sugar	1 lemon (small)
1 c seedless raisins	$\frac{1}{2}$ c nuts

Wash and cut the rhubarb in small pieces. Squeeze the orange and lemon and put the rind through the food chopper. Mix together rhubarb, orange and lemon rind, fruit juice, raisins, and sugar and allow to stand $\frac{1}{2}$ hour. Place on stove and bring to boiling. Let simmer for about 45 minutes or until thick. Pour into hot, sterilized jars, seal with sterilized tops, and store in a cool, dry place.

Orange-apricot conserve

$\frac{1}{2}$ lb dried apricots	1 c nuts
1 orange	$3\frac{3}{4}$ c sugar
1 small can crushed pineapple	

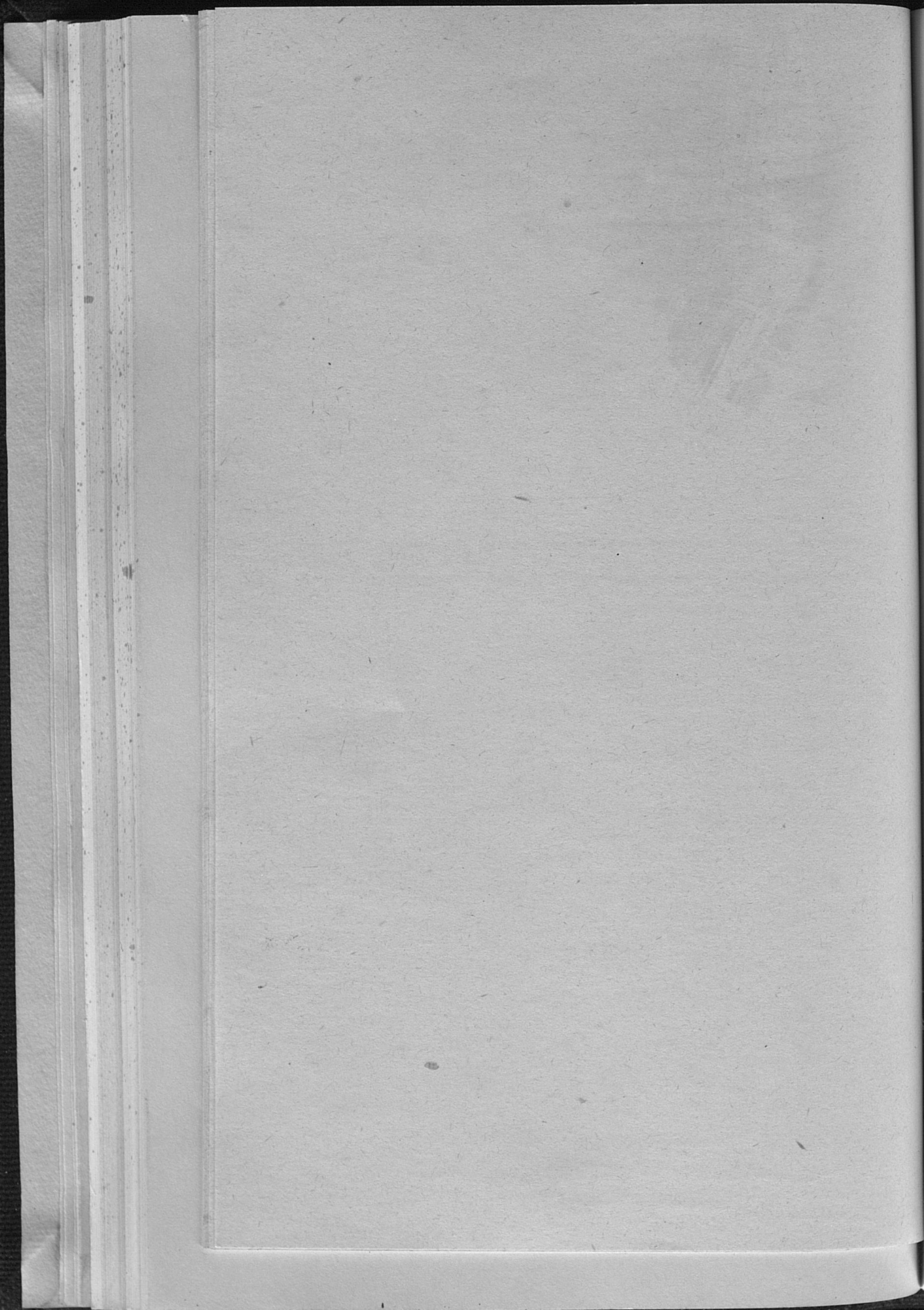
Soak the apricots over night and cook. Squeeze the orange. Put the rind through food chopper. Add orange juice and rind to apricots and cook, stirring constantly, about 15 or 20 minutes, or until the orange rind is tender. Cut nuts into medium-sized pieces. Add nuts, pineapple, and sugar to apricot-orange mixture. Cook until it meets the sheet test. Pour into sterilized jars, seal with sterilized tops, and store in a cool place.

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