

# Making Jellies

Fact Sheet No. 9.303

Food and Nutrition Series | **Preservation**

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Proper amounts of four ingredients, fruit, pectin, acid and sugar, are essential when making a jellied fruit product.

Fruit gives each product its characteristic flavor and furnishes at least part of the pectin and acid for successful gels. Irregular and imperfect fruit can be used as long as it is not spoiled, moldy or overripe.

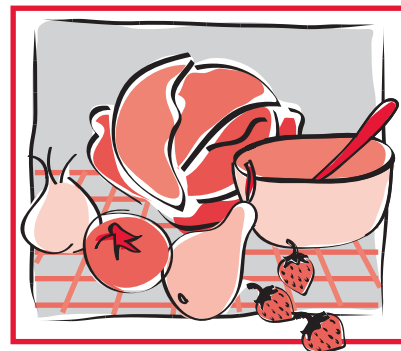
Pectin, a substance necessary for gel formation, occurs naturally in most fruits. It is concentrated in the skins and cores of various fruits. This is why many recipes include the skins and cores in preparing fruit for juice or pulp. The amount of pectin varies with the kind of fruit and degree of ripeness. Underripe fruit has a higher pectin content. As fruit ripens, the pectin is changed to a nongel-forming substance. Use one-fourth underripe and three-fourths fully ripe fruit to ensure sufficient pectin in jellied fruit products made without added pectin.

Tart apples, sour blackberries, crabapples, cranberries, currants, gooseberries, Eastern concord and wild grapes, lemons, loganberries, plums (except Italian) and quinces are examples of fruits that contain enough natural pectin and acid (if not overripe) to gel with only added sugar. Apricots, blueberries, cherries, figs, peaches, pears, pineapple, Italian prunes, raspberries, rhubarb and strawberries are low in pectin. Commercially canned or frozen fruit juices also are low in pectin. Combine low-pectin fruits with one of the high-pectin fruits or a commercial pectin.

Commercial pectins, made from apple or citrus fruits, are marketed in liquid and powder form. They cannot be used interchangeably in recipes. Follow the manufacturer's recipes and instructions. Many people prefer to use commercial pectin because it can be used with any fruit, the cooking time is shorter and more standardized, and the yield is higher for a given amount of fruit. Manufacturers of commercial pectins supply instructions with their products for making jams and jellies. The instructions in this fact sheet are for jellies made without added pectin.

The proper level of acidity is critical to gel formation. If there is too little acid, the gel will never set. If there is too much acid, the gel will lose liquid (weep). For fruits low in acid, add lemon juice or other acid ingredients as directed. Commercial pectin products contain acids that help ensure gelling.

Sugar serves as a preserving agent, contributes flavor and aids in gelling. Cane and beet sugar are the usual sources. Corn syrup and honey may replace part of the sugar in recipes, but too much will mask the fruit flavor and alter the gel structure. Use tested recipes for replacing sugar with honey or corn syrup. Do not try to reduce the amount of sugar in traditional recipes. Too little sugar prevents gelling and may allow yeasts and molds to grow.



## Quick Facts

- Jams and jellies can be made from imperfect fruit (not suited for freezing or canning) as long as the fruit is not overripe, spoiled or moldy.
- Use three-fourths firm-ripe and one-fourth underripe fruit to make jams and jellies without added pectin. Use fully ripe fruit to make jellied products with added pectin.
- Follow instructions exactly for best results. Making double batches or reducing the amount of sugar in the recipe may interfere with gel formation.
- Store jellied products in a clean, cool, dry, dark area, and use within one year.

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## Equipment and Containers

A large, flat-bottomed, 8- or 10-quart kettle is essential to allow the jelly mixture to come to a full, rolling boil without boiling over.

A jelly bag or a fruit press is useful for extracting fruit juice for jellies. The bag may be made of several thicknesses of closely woven cheesecloth, firm unbleached muslin, or cotton flannel with the napped side in. A special stand or colander holds the bag.

A jelly, candy or deep-fat thermometer helps determine doneness in jellied fruit products made without added pectin.

A boiling-water-bath canner is recommended for processing. A deep cooking pot with a rack may be used for a canner if it is deep enough for 1 to 2 inches of boiling water above the tops of the jars, plus a little extra space for boiling. Be sure the kettle has a close-fitting cover and a wire or wood rack with partitions to keep the jars from touching each other or the bottom or sides of the container.

Half-pint to pint standard canning jars with new lids are recommended for all jellied products. Be sure all jars and closures are perfect. Discard any with cracks, chips or defects that could prevent an airtight seal.

## Basic Steps for Making Jellies Without Added Pectin

For jellies made with added pectin, follow instructions and recipes provided by pectin manufacturers.

### Prepare Containers and Lids

Have the canning jars ready before starting to prepare the jellied fruit product. Wash the jars in warm, soapy water and rinse with hot water. Sterilize jelly containers by placing empty jars right side up on the rack in a boiling-water-bath canner. Fill the canner and jars with hot water to 1 inch above jar tops. Boil 10 minutes plus 1 minute per 1,000 feet elevation. Keep all containers in hot water until the jars are ready to drain and fill with hot jelly.

Wash and rinse all lids and bands. Treat the lids according to the manufacturer's directions. Use only new, unused lids. Bands can be reused.

### Prepare Fruit

Sort fruit carefully. Discard damaged or overripe parts. Remove caps, stems and blossom ends, but do not peel or core. The stems and pits of cherries and berries do not need to be removed because the jelly bag will collect them when the pulp is strained. Wash all fruits in cold running water or in several changes of cold water, lifting the fruit out of the water each time. Do not let fruit stand in water. Prepare fruit for juice extraction as directed in **Table 1**. The method will differ with the kind of fruit used.

### Extract the Juice

Put the prepared fruit in a damp jelly bag, fruit press or a double layer of damp cheesecloth. The clearest jelly comes from juice that has dripped through a jelly bag without pressing. Hang the jelly bag high enough over a

big mixing bowl so the tip of the bag cannot touch the strained juice. It may take several hours for all the juice to drip out. A greater yield of juice can be obtained by twisting the bag of fruit tightly and squeezing or pressing, or by using a fruit press. Squeezed or pressed juice should be re-strained through a double thickness of damp cheesecloth or a damp jelly bag.

### Test for Pectin in Fruit Juice

For jellies made without added pectin, it's important to know whether there is enough natural pectin to form a gel. Two methods to estimate the amount of pectin in fruit juice are the alcohol test and the jelmeter test. If either test indicates the juice is low in pectin, use a commercial pectin. Follow directions on the package or mix the juice with the juice of another fruit that is high in pectin.

**Alcohol test.** Add 1 tablespoon cooked, cooled fruit juice to 1 tablespoon denatured alcohol (rubbing alcohol, everyday 70 percent kind). Stir slightly to mix. Juices rich in pectin will form a solid jelly-like mass. Juices low in pectin will form small particles of jelly-like material. (Note: Denatured alcohol is poisonous. Do not taste the tested juice. Thoroughly wash all utensils used in this test.)

**Jelmeter test.** A jelmeter is a graduated glass tube with an opening at each end. The flow rate of fruit juice through the tube gives a rough estimate of the pectin in the juice and how much sugar to use.

### Test for Acid in Fruit Juice

If the prepared juice is not as tart as a mixture of 1 teaspoon lemon juice, 3 tablespoons water and 1/2 teaspoon of sugar, additional acid is needed for a successful gel. Add 1 tablespoon lemon juice or 1/8 teaspoon citric acid for each cup of fruit juice used.

**Table 1: Quick guide to making jellies without added pectin.**

Kind of Jelly	Amount of Fruit and Water	Preparation of Fruit for Juice Extraction	Jelly Ingredients	Yield
Apple	3 lbs tart red apples, 1/4 underripe, 3/4 ripe 3 cups water	Sort, wash and remove stems and blossom ends. Do not pare or core. Cut apples into small pieces. Add water, cover and bring to boil on high heat. Reduce heat and simmer 20-25 minutes, or until apples are soft.	4 cups juice 3 cups sugar 2 Tbsp strained lemon juice (optional)	4 to 5 half-pint jars
Blackberry	5 pts blackberries, 1/4 underripe, 3/4 ripe 3/4 cup water	Sort, wash and remove stems or caps. Crush berries. Add water, cover and bring to boil on high heat. Reduce heat and simmer 5 minutes.	4 cups juice 3 cups sugar	4 to 5 half-pint jars
Crabapple	3 lbs sound fruit, 1/4 underripe, 3/4 ripe 3 cups water	Sort, wash and remove stems and blossom ends. Do not pare or core. Cut crabapples into small pieces. Add water, cover and bring to boil on high heat. Reduce heat and simmer 20-25 minutes, or until crabapples are soft.	4 cups juice 4 cups sugar	4 to 5 half-pint jars
Grape (Concord or wild)	3 1/2 lbs grapes, 1/4 underripe, 3/4 ripe 1/2 cup water	Sort, wash and stem grapes. Put in kettle and crush. Add water, cover and bring to boil on high heat. Reduce heat and simmer 5-10 minutes. Note: To prevent formation of tartrate crystals in jelly, let juice stand overnight in cool place, strain through 2 thicknesses of damp cheesecloth.	4 cups juice 3 cups sugar	3 to 4 half-pint jars
Mint	1 cup firmly packed mint 1 cup boiling water	Pour boiling water over firmly packed mint leaves and let stand for 1 hour. Press juice from leaves to extract mint juice. Prepare apple juice as directed above.	4 cups apple juice 1/2 cup mint extract 3 cups sugar 2 drops green food coloring (add just before pouring into jars)	5 to 6 half-pint jars
Plum	3 lbs plums, 1/4 underripe, 3/4 ripe 1 1/2 cups water	Sort, wash and cut into pieces. Do not peel or pit. Crush fruit. Add water, cover and bring to boil on high heat. Reduce heat. Simmer 15-20 minutes or until fruit is soft.	4 cups juice 3 cups sugar	4 to 5 half-pint jars
Quince	3 1/2 lbs fruit, 1/4 underripe, 3/4 ripe 7 cups water	Sort, wash and remove stems and blossom ends. Do not pare or core. Slice quince thin or cut into small pieces. Add water, cover and bring to boil on high heat. Reduce heat and simmer 25 minutes.	3 3/4 cups juice 3 cups sugar 1/4 cup lemon juice	4 half-pint jars
Red currant	2 1/2 qts currants 2 1/2 cups water	Sort, wash and drain currants. Add water, cover and cook over moderate heat approximately 10 minutes until currants are soft and translucent, stirring frequently.	4 cups juice 3 1/2 cups sugar	4 to 5 half-pint jars

**Note: See text for directions on how to prepare, process and store these recipes.**

### Cook Jelly

Measure fruit juice into a kettle. Add lemon juice, if used, and sugar. When no recipe is available, use 3/4 cup sugar for each cup of juice. Stir until sugar dissolves. Place on high heat and bring rapidly to jelling point, stirring occasionally.

### Test for Doneness

Three methods may be used for testing jelly made without added pectin for doneness. Of these, the temperature test is the most dependable.

**Temperature test.** Shortly before cooking the jelly, take the temperature

of boiling water with a jelly, candy or deep-fat thermometer. Cook the jelly mixture to a temperature 8 degrees F higher than the boiling point of water. The "done" temperature will be lower at high altitudes than at sea level because water boils at a lower temperature as altitude increases (1.9 degrees F less



Figure 1: Spoon or sheet test.

per 1,000 feet above sea level). For an accurate thermometer reading, place the thermometer in a vertical position and read at eye level. The bulb of the thermometer must be completely covered with the jelly mixture but not touch the bottom of the kettle.

**Spoon or sheet test.** Dip a cool metal spoon in the boiling jelly mixture. Then raise it at least 1 foot above the kettle, out of the steam, and turn the spoon so the syrup runs off the side. If the syrup forms two drops that flow together and fall off the spoon as one sheet, the jelly should be done. (See Figure 1.)

**Refrigerator and freezer test.** Pour a small amount of boiling jelly onto a cold plate. Put it in the freezer compartment of the refrigerator for a few minutes. If the mixture gels, it should be done. Remove the jelly mixture from the heat during this test so it doesn't overcook.

### Fill and Seal Containers

After the jelly is done, remove it from the heat and quickly skim off any foam. Pour or ladle the hot jelly immediately into hot sterilized canning jars to 1/4 inch of jar tops. Wipe each jar rim clean and place a hot, pretreated metal lid on the jar with the sealing compound next to the glass. Screw the metal band down fingertip tight.

### Process Jelly in Boiling Water Bath

Process all jellied fruit products in a boiling water bath to prevent mold growth. Mold develops on jellied fruit products when the seal is not vacuum tight. Molds on jams and jellies were once thought to be harmless and needed only to be scraped off before using the rest of the product. However, microscopic mold filaments and toxins may extend beyond the mold itself. These have produced cancer in test animals and, therefore, should be avoided.

Place the filled, hot, closed jars on a rack in a canner or deep kettle half-filled with very hot water (170 to 180 F). Add additional hot water to bring the water 1 or 2 inches over the tops of the jars. Cover the container and bring the water to a rolling boil. Process for your altitude according to the box below.

### Recommended Boiling Water Bath Processing Times for Jelly.

**Style of Pack:** Hot

**Jar Size:** Half pints or pints

**Process time at altitudes of:**

0-1,000 ft. = 5 min.

1,001-6,000 ft. = 10 min.

Above 6,000 ft. = 15 min.

At the end of the processing time, remove jars from the canner onto a rack or towel. Let cool away from drafts for 12 hours or overnight.

### Storage

Before storing, remove screw bands and check seals. Label jars with the name, canning method and date. Store in a cool, dry, dark, clean area. The shorter the storage time, the better the eating quality of the product. Flavor and quality may begin to decrease within a few months, although most jellied products should keep for at least one year.

### References

- Ball Blue Book of Preserving. Alltrista Consumer Products.* Muncie, Ind.: 2004.
- USDA Complete Guide to Home Canning.* AIG 539, U.S. Dept. of Agriculture, 2009.
- Reynolds, S. and P. Williams. *So Easy To Preserve.* Cooperative Extension Service, University of Georgia, Athens, 5th ed, 2006.