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Making and Preserving Jams, Jellies and Other Soft Spreads

Jams, jellies, and other soft spreads are foods with a variety of textures, flavors, and colors. They all consist of fruits, preserved mostly by means of sugar, and they are thickened or jellied to some extent.

Jams are made by cooking crushed or chopped fruits with sugar. They are thick, sweet spreads that tend to hold their shape but are less firm than jelly. The shape of fruit pieces are not retained when making jam. Jam has a uniform consistency and is thick enough to spread.

Jellies are usually made by cooking fruit juice with sugar and prepared in a way that keeps the juice crystal clear and shimmering. It should be firm enough to hold its shape when turned out of the container but should quiver when the container is moved. When cut, it should be tender yet retain the angle of the cut. Jelly should have a flavorful fresh fruity taste that is not too tart and not too sweet.

Preserves are small, whole fruits or uniformly sized pieces in a thick slightly gelled sugar syrup. The fruit should be tender and plump. The color should be characteristic of the fruit and fruit pieces should be translucent to clear.

Conserves are jam-like made with a combination of two or more fruits, nuts and raisins. Conserves are cooked until they round up on a spoon. If nuts are used, they can be added during the last five minutes of cooking.

Marmalades are soft fruit jellies containing small pieces or slices of fruit or fruit peel evenly suspended in the transparent jelly. They usually include citrus.

Fruit butters are soft spreads made by cooking fruit pulp with sugar to a thick spreadable consistency. They are thick enough to mound on a spoon. Spices are often added.

Basic Ingredients

For an acceptable jam or jelly, the proper proportions of fruit, sugar, acid and pectin are needed.

Fruit - The fruit gives each spread its unique flavor and color. It also supplies the liquid to dissolve the rest of the necessary ingredients and furnishes some or all of the pectin and acid. High-quality, flavorful fruits make the best jellied products.

Sugar - Sugar serves as a preserving agent, contributes flavor, and aids in gelling. Cane and beet sugar are the usual sources of sugar for jelly or jam. Corn syrup and honey may be used to 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 and 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.

Acid – Acid adds flavor. 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 usually contain acids which help to ensure gelling.

Pectin - Pectin is a substance found in fruits that forms a gel if it is in the right combination with acid and sugar. All fruits contain some pectin. Those listed in Group I usually contain enough natural pectin to form a gel. Other fruits, such as those in Group III below contain little pectin and must be combined with other fruits high in pectin or with commercial pectin products to obtain gels. The following table lists the relative amount of pectin and acid for most fruits. Because fully ripened fruit has less pectin, one-fourth of the fruit should be under-ripe when making jellies without added pectin.

Table I: Pectin and Acid Content of Common Fruits Used to Make Jam and Jelly

Group I: If not overripe, has enough natural pectin and acid for gel formation with only added sugar. Group II: Low in natural acid or pectin, and may need addition of either acid or pectin. Group III: Always needs added acid, pectin or both.		
Group I	**Group II**	**Group III**
Apples, sour	Apples, ripe	Apricots
Blackberries, sour	Blackberries, ripe	Blueberries
Crabapples	Cherries, sour	Figs
Cranberries	Chokecherries	Grapes (Western Concord)
Currants	Elderberries	Guavas
Gooseberries	Grapefruit	Peaches
Grapes (Eastern Concord)	Grape Juice, bottled	Pears
Lemons	(Eastern Concord)	Plums (Italian)
Loganberries	Grapes (California)	Raspberries
Plums (not Italian)	Loquats	Strawberries
Quinces	Oranges	

Commercial Pectin by Type and Other Thickeners

Commercial pectin is extracted from apple cores or the white layers of citrus fruit and usually contains added acid to ensure jelling. With commercially available pectin, quality jams and jellies may be made with all fruits, including those low in natural pectin. For successful products, use pectin as directed and do not exchange one type of pectin for another. Measure ingredients exactly and prepare one batch at a time. Doubling a recipe may prevent proper jelling. Purchase fresh pectin each year. Old pectin may result in poor gels. Preservatives may be included in commercial pectin to prevent microbial spoilage of the finished products.

Commercially available pectin is categorized by type: regular or modified pectin. Included below are several different brands that are available locally or on the Internet.

Regular pectin is available in both liquid and powdered forms and is used primarily to make full-sugar jams and jellies. Follow the directions that come with the package and do not reduce the sugar or substitute the sugar with other types of sweeteners. Some regular pectin includes special recipes that have been formulated so that no added sugar is needed. However, each package of commercial regular pectin does contain some sugar as noted below. Artificial sweetener is often added in the recipe. The shelf life for regular pectin is one year for best results.

Modified pectin is available in powdered form and may be used to make low- and no-sugar jams and jellies and other fruit spreads with sugar substitutes or no sweeteners that are lower in calories than products made with regular pectin.

Regular Pectin

Certo® Premium Liquid Fruit Pectin is a liquid pectin which contains lactic acid and citric acid to help form a gel. Certo liquid pectin may be used for cooked or no-cook freezer jams and jellies. Do not reduce the amount of sugar or substitute artificial sweeteners. Sodium benzoate is an added preservative. One box (6 fluid ounces/two pouches) typically makes one to two batches of jam or jelly. For more information, check www.kraftfoods.com/surejell/.

Ball® RealFruit Liquid Pectin is a liquid pectin for making homemade jams and jellies which contains citric acid and lactic acid to assist in gel formation, potassium citrate to control acidity, and sodium benzoate is an added preservative. This product is formulated for less foam formation. One box (6 fluid ounces/two pouches) typically makes one to two batches of jam or jelly. For more information, check www.freshpreserving.com.

Sure-Jell® Premium Fruit Pectin (Yellow Box) is a powdered pectin for use in making cooked and no-cook freezer jams and jellies. Fumaric acid is added to assist in gel formation. No preservatives are added. Do not reduce the amount of sugar or use artificial sweeteners. One 1.75 ounce box typically makes one batch of jam or jelly. For more information, check www.kraftfoods.com/surejell/.

Ball® RealFruit Classic Pectin is a powdered pectin that can be used to make cooked jams and jellies and no-cook freezer jams. Citric acid is added to assist in gel formation and dextrose as an added sweetener. Use the amount of sugar specified in the recipes included in the package. One 4.7 ounce jar makes approximately 22 half-pints of jam or jelly. For more information, check Ball's website www.freshpreserving.com.

MCP® Premium Fruit Pectin is a powdered pectin that contains citric acid to aid in forming a gel and dextrose as an added sweetener. No preservatives are added. MCP powdered pectin may be used for cooked and no-cook freezer jams and jellies. Sugar should not be reduced or artificial sweeteners substituted. One 2 ounce box typically makes one batch of jam or jelly. For more information, check www.kraftfoods.com/surejell/.

Mrs. Wages® Fruit Pectin Home Jell is a powdered pectin that can be used for cooked jams and jellies and for uncooked freezer jams. Fumaric acid is added to ensure gel formation. Preservatives are not added. Use the exact amount of sugar required in the recipe provided with the pectin. For more information, check www.mrswages.com.

Modified Pectin

Two types of modified pectins are available for home use to make reduced calorie jams and jellies. One type will form a gel with one-third less sugar. The other type, low-methoxyl pectin, requires a calcium source for gel formation.

Sure-Jell® Premium Fruit Pectin (Pink Box) is a *modified* pectin that can be used for making cooked jams and jellies and no-cook freezer jams and jellies with at least 25% less sugar than traditional recipes, or Splenda can be added to make jam and jelly with no added sugar. Dextrose is an added sweetener and fumaric acid and sodium citrate are added to help with gel formation. For more information, check www.craftfoods.com/surejell/.

Mrs. Wages® Light Home Jell is a *low-methoxyl* powdered fruit pectin. Jams and jellies can be made with or without sugar or with artificial sweeteners using this pectin. Calcium phosphate is added to provide the calcium

necessary to form a gel without added sugar. Fumaric acid is the added acid, and potassium sorbate is included as a preservative. For more information, check www.mrswages.com.

Ball® RealFruit Low or No-Sugar Needed Fruit Pectin is a *low-methoxyl* powdered pectin that can be used to make cooked jams and jellies and no-cook freezer jams and jellies. This pectin includes dextrose as an added sweetener, citric acid to assist in gel formation, and calcium ascorbate to help retain color. Products may be sweetened with any type of sugar, honey, or artificial sweeteners or no sweetener. One 4.7 ounce jar makes approximately 22 half-pints of jam or jelly. For more information, check www.freshpreserving.com.

Pomona's Pectin® is a *low methoxyl* powdered citrus pectin with no dextrose or preservatives. Cooked jams and jellies, including freezer jam, may be sweetened with sugar, honey, agave, xylitol, fruit juice concentrate and stevia. One 1.1 ounce box typically makes two to four batches of jam or jelly. According to the manufacturer, Pomona's Pectin keeps indefinitely. For more information, check www.pomonapectin.com.

Gelatin

Gelatin, a protein substance derived from collagen, may be used in refrigerator fruit spreads. Products made with gelatin should not be processed and must be refrigerated and used within one month.

Knox Unflavored Gelatin® contains gelatin, not pectin. Gelatin is used in some jam and jelly recipes as a thickener. These products need to be refrigerated to remain thickened and to prevent mold growth. Artificial sweeteners can be used with jam and jelly recipes made with gelatin.

Methods of Making Jams and Jellies

There are two basic methods of making jams and jellies: the quick-cook method, which uses added pectin and the traditional long-boil method, which does not require added pectin. The long-boil method works best with fruits naturally high in pectin. The quick-cook method, which requires the use of commercial liquid or powdered pectin, is easier and results in a greater yield. The gelling ability of various pectins differs. To make uniformly gelled products, be sure to add the quantities of commercial pectin to specific fruits as instructed on each package. Overcooking may break down pectin and prevent proper gelling.

When using either method, make one batch at a time according to the recipe. Increasing the quantities often results in soft gels. Stir constantly while cooking to prevent burning. Recipes are developed for specific jar sizes. If jellies are filled into larger jars, excessively soft products may result. To use 4-ounce jars or 12-ounce jars for soft spreads, follow the same processing time as given for 8-ounce jars.

Making Jams and Jellies with Added Pectin (Quick-Cook Method)

Fresh fruit and juices, as well as commercially canned or frozen fruit juice, can be used with commercially prepared powdered or liquid pectin. The order of combining ingredients depends on the type of pectin used. Complete directions for a variety of fruits are provided with packaged pectin.

Jam or jelly made with added pectin requires less cooking and generally gives a larger yield. These products have more natural fruit flavors, too. In addition, using added pectin eliminates the need to test hot jams and jellies for proper jelling. Adding 1/2 teaspoon of butter or margarine with the juice and pectin will reduce foaming. However, this may cause off-flavor in long-term storage of jams and jellies.

Making Jam *Without* Added Pectin (Traditional Long-Boil Method)

Wash and rinse all fruits thoroughly before cooking. Do not soak fruit. For best flavor, use fully ripe fruit. Remove stems, skins, and pits from fruit; cut into pieces and crush. For berries, remove stems and blossoms and crush. Seedy berries may be put through a sieve or food mill. Measure crushed fruit into large saucepan using the ingredient quantities specified in Table II below.

Table II: Ingredient Quantities for Jam without Added Pectin

Fruit	Crushed Fruit (Cups)	Sugar (Cups)	Lemon (Tsp)	Yield (half-pints)
Apricots	4 to 4-1/2	4	2	5 to 6
Berries*	4	4	0	3 to 4
Peaches	5-1/2 to 6	4 to 5	2	6 to 7
*Includes blackberries, boysenberries, dewberries, gooseberries, loganberries, raspberries and strawberries.				

Add sugar and bring to a boil while stirring rapidly and constantly. This may take anywhere from 25 to 45 minutes or more. Continue to boil until mixture thickens. Use either the freezer or temperature test described below to determine when jam has reached the gel stage and is ready to be processed for long-term storage.

NOTE: Fruit spreads may be made which are lower in sugar and calories than regular jams and jellies. Low-calorie jams and jellies cannot be made by leaving the sugar out of regular jam and jelly recipes. However, reduced sugar fruit spreads can be made by boiling fruit pulp for extended periods of time, which will make a product thicken and resemble a jam, preserve, or fruit leather. Artificial sweetener may be added. For best results, add artificial sweetener after heating.

Making Jelly *without* Added Pectin (Traditional Long-Boil Method)

Making the juice is the first step in making any fruit juice jelly. Use only firm fruits naturally high in pectin. One way to quickly test for pectin is the "alcohol test". Add 1 teaspoon of juice to 1 tablespoon of rubbing alcohol. To mix, gently stir or shake the mixture in a closed container so that all the juice comes in contact with the alcohol. DO NOT TASTE – the mixture is poisonous. Fruit high in pectin will form a sold jelly-like mass that can be picked up with a fork. If the juice fails to gel or clumps into several small particles, there is not enough pectin for jelly.

Select a mixture of about 3/4 ripe and 1/4 under-ripe fruit. Do not use commercially canned or frozen fruit juices. Their pectin content is too low. Wash all fruits thoroughly before cooking. Do not soak fruit. Crush soft fruits or berries; cut firmer fruits into small pieces. Using the peels and cores adds pectin to the juice during cooking. Add water to fruits that require it, as listed below. Put fruit and water in large saucepan and bring to a boil. Simmer according to the times shown in Table III below until fruit is soft, while stirring to prevent scorching. One pound of fruit should yield at least 1 cup of clear juice and 4 cups of juice should yield about 4 half-pints.

Table III - Extracting Juices and Making Jelly without Added Pectin

			Ingredients Added to Each 4 Cup of Strained Juice		
	Cups of Water to Pound of Fruit	Minutes to Simmer Fruit before Extracting Juice	Sugar	Lemon Juice	Jelly Yield from 4 Cups of Juice (half-pints)
Apples	1	20 to 25	3 cups	2 tablespoons	4 to 5
Berries*	None or 1/4	5 to 10	3 to 4 cups	None	5 to 6
Crab Apples	1	15 to 20	3 to 4 cups	None	5 to 6
Plums	1/2	15 to 20	3 cups	None	5 to 6
*Includes blackberries, boysenberries, dewberries, loganberries, raspberries and youngberries.					

When fruit is softened, strain through a double layer of wet cheesecloth or a wet jelly bag. Allow juice to drip through, using a stand or colander to hold the bag. Pressing or squeezing the bag or cloth will cause cloudy jelly. The juice may be frozen at this time to be used another day.

Combine fruit juice with sugar and bring to a boil while stirring rapidly and constantly. This may take anywhere from 25 to 45 minutes or more. Continue to boil until mixture thickens. Use the sheet or temperature test, described below, to determine when jelly has reached the gel stage and is ready to be processed.

Tests for Proper Gelling when using the Traditional Long-Boil Method

Sheet or Spoon Test – Dip a cool metal spoon into the boiling jelly mixture. Raise the spoon about 12 inches above the pan (out of steam). Turn the spoon so that liquid runs off the side. The jelly is done when the syrup forms two drops that flow together and sheet or hang off the edge of the spoon.

Freezer Test – Remove the jam mixture from the heat. Pour a small amount of boiling jam on a cold plate or spoon and put it in the freezing compartment of a refrigerator for a few minutes. Remove it from the freezer. If the mixture gels, it should be done.

Temperature Test – Use a jelly or candy thermometer and boil until jam or jelly mixture reaches the following temperatures at altitudes of:

Sea Level	1,000 ft.	2,000 ft.	3,000 ft.	4,000 ft.	5,000 ft.	6,000 ft
220°F	218°F	216°F	214°F	212°F	211°F	209°F

Canning Jams, Jellies and Other Soft Spreads

Jams, jellies and other soft spreads are considered high-acid foods and may be safely canned using either a boiling water canner or atmospheric steam canner. Follow recipe directions for canning your product for long-term storage. As a general guideline, full-sugar jams, jellies and other soft spreads should be placed in sterilized jars and processed in a boiling water or atmospheric steam canner for 5 minutes at altitudes of 0-1,000 feet. Processing time should be increased to 10 minutes if jars have not been sterilized. Add 1 minute to the processing time for each 1,000 feet of additional altitude. The basic processing time for low- or reduced-sugar jams, jellies and other soft spreads should be increased by an additional 5 minutes to a total of 10 minutes and, again, adjusted for altitude differences by adding 1 minute to the processing time for each 1,000 feet of altitude in excess of 1,000 feet.