

# Making Jams, Jellies and Syrups

## including with wild Montana berries and fruit

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**Instructions for making jams, jellies and syrups with and without added pectin and for reduced-sugar fruit jams.**

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### Safety is the Top Priority

Safely canning foods at home requires using processing methods that not only preserve the food but also destroy bacteria and molds that cause foodborne illness, such as botulism. Botulism, caused by a toxin of the bacteria *Clostridium Botulinum*, can be fatal. This bacteria can grow and reproduce in improperly processed home-canned foods. Protect yourself and others when sharing home-canned foods by learning safe preservation techniques. The safest recipes and resources are those that have been researched and rigorously tested by the United States Department of Agriculture (USDA) and Extension Services associated with land-grant universities. Many home-preserved recipes are not tested for safety, so it is critical to use the resources below.

### Recommended Research-based Food Preservation Resources

National Center for Home Food Preservation (NCHFP), USDA sponsored website is the most current source for publications, video clips, tutorials for the beginning home food preserver, frequently asked questions, and seasonal tips: <http://nchfp.uga.edu/>

*USDA Complete Guide to Home Canning, 2015.* Earlier editions not recommended. Available on NCHFP website, click on 'publications.'

*So Easy to Preserve, 6th edition, 2014 only.* Earlier editions not recommended. <http://www.soeasytopreserve.com>

Free Canning Timer & Checklist app  
<https://catalog.extension.oregonstate.edu/pnw689>

The following publications are available at local stores or order online: *The All New Ball Blue Book of Canning and Preserving*, 1st ed., 2016; *The Best Ball Home Canning and Preserving Recipes: Fresh Flavors All Year Long*, 1st ed. 2016; *Ball Blue Book Guide to Preserving, 37th ed.*, 2014. Earlier editions not recommended.

### Four Essential Ingredients for Jams, Jellies

All types of jams, jellies and syrups contain four essential ingredients.

#### 1. Fruit

- Provides unique flavor and characteristic color as well as some pectin and acid.
- Overripe fruit should be used with caution in products without added pectin as they have less natural pectin. For more information on pectin that occurs naturally in fruits, see the pectin information below.
- Use fruit free from spoilage and mold. Some irregularly shaped and imperfect fruit can be used. In addition, canned or frozen fruit can be used for making jelly.
- When using wild berries and fruits, follow the same recommendations as for similar cultivated fruits found in this MontGuide and listing of resources found to left.

#### 2. Pectin

- Pectin is found naturally in fruits and is the ingredient, when combined with sugar or other sweeteners (excluding artificial sweeteners), that causes the fruit to gel.
- Slightly underripe fruit contains the most pectin; as fruit ripens, the pectin changes to a non-gelling form. Usually using  $\frac{1}{4}$  underripe fruit to  $\frac{3}{4}$  ripened fruit makes the best product. Cooking brings out the pectin, but cooking too long destroys it, so follow cooking directions closely.
- Pectin is concentrated in the skins and cores of fruits. This is why recipes often call for using skins and cores for juicing or pulping.
- Commercial pectin comes in liquid and powdered form, but is not interchangeable in recipes. Be sure to follow the manufacturer's recipes and instructions.
- Reduced-sugar jams and jellies and no-added sugar jams and jellies use different commercial pectin. Follow directions carefully.

#### 3. Acid

- Acid is necessary for gel formation and flavor.
- Fruits naturally contain acid, but the amount of acid varies with the fruit and degree of ripeness.

- It is important to follow recipe directions carefully to determine if additional acid is needed for the specific fruit being preserved.

#### 4. Sweeteners

- Sugar is essential to help gel to form and contributes to flavor and taste. The type of sugar used in recipes is granulated white sugar.
- Use the specific amount of sugar called for in the recipe. The amount of sugar must be in proper proportion with pectin and acid to make a good gel. Reducing the amount of sugar in the recipe contributes to poor gelling or the lack of gelling.
- Other types of sweeteners, such as honey or reduced-calorie sweeteners, can be used. It is important to use recipes that have been tested using these sweeteners. To make jam or jelly with no added sugar, use a specially modified commercial pectin.

Light corn syrup or light mild honey can be used to replace part, but not all, of the granulated sugar. Without added pectin, honey can replace up to ½ of the sugar. With added pectin, 2 cups honey can replace 2 cups sugar in most recipes. The flavor will be slightly different. However, it is best to use recipes calling for honey or corn syrup rather than substituting these sweeteners for sugar.

Brown sugar, sorghum and molasses are not recommended since their flavor overpowers the fruit flavor.

#### Equipment

**Large saucepan:** An 8 to 10 quart pot with a broad flat bottom works the best. A heavy metal container is best because it allows even heat distribution.

**Jelly bag/cloth:** Used for extracting juice for jelly or syrup, the bag can be made of several thicknesses of closely woven cheesecloth or firm unbleached muslin.

**Thermometer:** Jelly or candy thermometer may be used for determining doneness.

**Wide-mouthed funnel:** Used to fill jars.

**Ladle or measuring cup:** Used to fill jars.

**Boiling water canner:** Necessary for processing jams, jellies and syrups, boiling water canners are used for high acid foods and are equipped with lid and bottom rack. Pot must be deep enough to hold the size of jar being processed with one inch of water covering the top of lid and an additional 2 inches of air space to prevent boil over.

**Jars:** Recommended jars are Mason-type, threaded, home-canning jars. Use only half-pint or one-pint jars. Be sure all jars are free from cracks or chips. Do not use commercial jelly or mayonnaise-type jars.

**Lids:** Follow manufacturers directions to prepare lids.

#### Altitude Adjustments

Processing times are based on altitude. Altitudes are found in Table 3 (insert) of this guide.

#### Making Jellies, Syrups and Jams

##### *Recommended Recipes for Making Jellies, Syrups and Jams*

This guide contains recipes for many fruits, including wild Montana berries and fruit. See Tables 4 and 5 (insert). Recipes and/or more detailed directions for fruits can also be found in one of the resources found on page 1 or on the commercial pectin packages: apple, apricot, blackberry, blueberry, boysenberry, cherry, crabapple, currant, dewberry, elderberry, fig, gooseberry, grape, loganberry, may haw, mint, orange marmalade, peach, pear, plum, rhubarb, strawberry, spiced tomato, black or red raspberry, and youngberry.

##### *Preparing Jellies, Syrups and Jams With and Without Pectin*

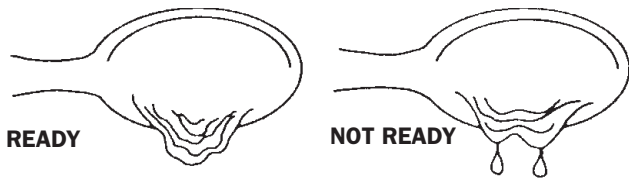
Making jellies and jams with commercial pectin simplifies the process. Jellies and jams without added commercial pectin may contain less sugar; however, it is generally more challenging to ensure a quality product. Syrups may or may not require commercial pectin.

**TABLE 1. Recommended processing time for jellies, jams and syrups with and without added pectin in a boiling water canner.**

Style of pack	Jar size	Processing time at altitudes of:		
		0-1000 feet	1,001-6,000 ft	Above 6,000 ft
Hot	Half-pints or pints	10 minutes	15 minutes	20 minutes

**TABLE 2. Temperature test altitudes for boiling point**

Sea Level	1,000 feet	2,000 feet	3,000 feet	4,000 feet	5,000 feet	6,000 feet	7,000 feet	8,000 feet
220°F	218°F	216°F	214°F	212°F	211°F	209°F	207°F	205°F



**FIGURE 1 (Sheeting Test).** If jelly mixture on a spoon forms drops that flow together and sheet or hang off the edge of the spoon, the jelly is done.

### *Preparing the Fruit for Syrups and Jellies*

1. If not using pectin, use  $\frac{1}{4}$  slightly underripe fruit and  $\frac{3}{4}$  ripened fruit. If pectin will be added, all ripe fruit can be used.
2. Wash fruit and discard caps, stems and damaged portions, but do not remove the skin or cores, since natural pectin found in fruit is concentrated in these parts.
3. Extracting the juice
  - One pound of fruit should yield at least one cup of clear juice.
  - Refer to Table 5 (insert), to determine if water needs to be added to fruit in a large saucepan.
  - Bring contents to a boil and simmer according to the times listed in Table 5 until fruit is soft. Stir to prevent scorching.
  - Strain saucepan contents through a damp jelly bag/cloth, allowing the juice to drip. The clearest juice comes from juice that drips through a jelly bag without pressing, but there is more juice when the bag is twisted tightly and squeezed. If the jelly bag is pressed, juice should be re-strained through a clean jelly bag/cloth for clarity.

### *Making Jelly Without Added Pectin*

**General:** Test juice to determine if there is enough natural pectin to form a gel. Measure  $\frac{1}{3}$  cup juice and  $\frac{1}{4}$  cup sugar into a small saucepan. Heat slowly, stirring constantly until all the sugar is dissolved. Bring the mixture to a boil and boil rapidly until it is done according to the sheeting test (Figure 1). Pour the jelly into a clean, hot jelly glass or a small bowl and let cool. If the cooled mixture is jelly-like, your fruit juice will gel.

1. To make jelly without using commercial pectin, measure the required amount of extracted juice into a large saucepan. Use no more than 6 to 8 cups of extracted fruit juice at a time. Measure fruit juice, sugar and lemon juice according to Table 5 and heat to boiling.
2. Stir until the sugar dissolves and boil over high heat to the gelling point as determined using one of the methods in Step 3.
3. The biggest challenge is knowing when it's done without added pectin. Two methods of testing for doneness are:

*Temperature test:* Use a jelly or candy thermometer and boil until mixture reaches the temperatures at the altitudes in Table 2 (page 2). This test is the most dependable. Altitudes are found in Table 3 (insert).

*Sheet or spoon test:* Dip a cool, metal spoon into jelly mixture and raise the spoon about 12 inches above the pan, making sure to hold it out of the steam. Turn the spoon so the liquid 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).

4. Remove from heat and quickly skim off foam.
5. Fill clean, hot jars with jelly by ladling jelly through a wide-mouth funnel, leaving  $\frac{1}{4}$  inch headspace. Wipe any spilled jelly from the rim of jars to ensure sealing.
6. Using self-sealing, two-piece lids. Adjust lids fingertip tight.
7. Process according to time and altitude (Tables 1 and 3).
8. Turn off heat. Remove boiling water canner lid after the required processing time. Wait 5 minutes before removing jars.

### *Making Syrup Without Added Pectin*

1. According to recipe, add sugar, fruit mixture and other ingredients and stir frequently over low heat until sugar dissolves. For a thinner product, shorten the cooking time; for a thicker product, lengthen it. See Table 5 (insert) for suggested recipes.
2. Follow Steps 4-8 in Making Jelly Without Added Pectin.

### *Making Jam Without Added Pectin*

1. According to recipe, add sugar, fruit mixture and other ingredients and stir frequently over low heat until sugar dissolves. For a softer product, shorten the cooking time; for a firmer product, lengthen it. See Table 5 (insert) for suggested recipes.
2. Test jam using the temperature test found in Step 3 under Making Jelly Without Added Pectin.
3. After testing, follow Steps 4-8 in Making Jelly Without Added Pectin.

### *Making Jellies, Syrups and Jams With Added Pectin*

Fresh fruits 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.

Jelly, syrup or jam made with added pectin requires less cooking and generally gives a larger yield. In addition, using added pectin eliminates the need to test hot jellies and jams for proper gelling. Adding  $\frac{1}{4}$  teaspoon of butter or margarine with the juice and pectin will reduce foaming.

Purchase fresh pectin each year; check the date on the box or bottle, as old pectin may result in poor gels. Follow all directions carefully or a poor quality product may result. Common mistakes include reducing ingredients or doubling a recipe.

## Reduced-sugar Fruit Jams

Reduced-sugar fruit jams are tasty, yet lower in calories and sugars than regular jams.

Sweetness can be provided by using sweet fruits, juices, spices, or a liquid reduced-calorie sweetener. When making a reduced-sugar fruit jam, follow the directions available with the product developed for that purpose, such as a reduced-sugar commercial pectin product.

Follow the directions on the modified pectin box or in a no-sugar recipe exactly. Alterations in the recipe could result in product failures. Because these products do not have sugar as their preservative, be sure to process and/or store them as directed.

## Storage

Freshly made jellies and jams should not be moved for at least 12 hours following processing because moving them could break the gel. After 12 hours, check the seals and remove the screw band. Some jelly and jam may take up to 2 weeks to fully set. Jelly, syrup or jam should be stored in a cool, dry, dark place. These products should keep for at least a year, however their flavor and quality may begin to decrease within a few months.

## Remaking Runny Jelly and Jam

It is critically important to carefully follow directions from the pectin manufacturer for remaking jams and jellies. However, even carefully following directions from manufactures and the recommendations below, remaking jellies and jams is not fail-safe and does not always work. Measure jelly to be recooked. Work with no more than 4 to 6 cups at a time.

### *To remake with powdered pectin:*

For each quart of jelly, mix  $\frac{1}{4}$  cup sugar,  $\frac{1}{2}$  cup water, 2 tablespoons bottled lemon juice, and 4 teaspoons powdered pectin. Bring to a boil while stirring. Add jelly and bring to a rolling boil over high heat, stirring constantly. Boil hard  $\frac{1}{2}$  minute. Remove from heat, quickly skim foam off jelly, and fill jars, leaving  $\frac{1}{4}$ -inch headspace. Adjust new lids and process as recommended in Table 1.

### *To remake with liquid pectin:*

For each quart of jelly, measure  $\frac{3}{4}$  cup sugar, 2 tablespoons bottled lemon juice, and 2 tablespoons liquid pectin. Bring jelly only to boil over high heat, while stirring. Remove from heat and quickly add the sugar, lemon juice, and pectin. Bring to a full rolling boil, stirring constantly. Boil hard for 1 minute. Quickly skim off foam and fill jars, leaving  $\frac{1}{4}$ -inch headspace. Adjust new lids and process as recommended in Table 1.

### *To remake without added pectin:*

For each quart of jelly, add 2 tablespoons bottled lemon juice. Heat to boiling and boil for 3 to 4 minutes. Use one of the tests described on page 5 for Temperature Test or Sheet or Spoon Test to determine jelly doneness. Remove from heat, quickly skim off foam, and fill jars, leaving  $\frac{1}{4}$ -inch headspace. Adjust new lids and process as recommended in Table 1.

## Acknowledgements

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**EXTENSION**

**File under: Nutrition and Health (Food Preservation)**  
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**TABLE 3. Altitudes\* of County Seats in Montana**

County Seat	Elevation	County Seat	Elevation	County Seat	Elevation
Anaconda	5239	Fort Benton	2698	Plentywood	2068
Baker	2968	Glasgow	2088	Polson	2930
Big Timber	4199	Glendive	2053	Red Lodge	5562
Billings	3153	Great Falls	3398	Roundup	3198
Boulder	4938	Hamilton	3625	Ryegate	3775
Bozeman	4806	Hardin	2903	Scobey	2461
Broadus	3091	Harlowton	4185	Shelby	3300
Butte	5539	Havre	2493	Sidney	1967
Chester	3162	Helena	4068	Stanford	4288
Chinook	2411	Hysham	2618	Superior	2813
Choteau	3799	Jordan	2640	Terry	2228
Circle	2500	Kalispell	2984	Thompson Falls	2519
Columbus	3599	Lewistown	3936	Townsend	3869
Conrad	3523	Libby	2198	Virginia City	5804
Cut Bank	3793	Livingston	4557	W. Sulphur Spr.	5091
Deer Lodge	4609	Malta	2275	Wibaux	2650
Dillon	5118	Miles City	2362	Winnett	2975
Ekalaka	3494	Missoula	3232	Wolf Point	2043
Forsyth	2510	Phillipsburg	5357		

\*accessed March, 2017, [http://geoinfo.msl.mt.gov/geography/geography\\_fact](http://geoinfo.msl.mt.gov/geography/geography_fact):

**TABLE 4. Making Specialty Jams**

Fruit	Cups crushed fruit	Cups sugar	Tbsp lemon juice	Pectin	Directions
Apricots	8	6	4	—	Add ingredients and stir until sugar dissolves. Follow directions 4-8 on page 5.
Berries*	9	6	—	—	Add ingredients and stir until sugar dissolves. Follow directions 4-8 on page 5.
Figs	8	6	4	—	Pour boiling water over figs. Drain, stem and chop. Add sugar and $\frac{3}{4}$ cup water to figs. Slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick. Stir frequently to prevent sticking. Add lemon juice and cook 1 minute longer.
Gooseberries	6	4	—	—	Add $1\frac{1}{2}$ cups of water and berries. Reduce heat and simmer until berries are soft, approximately 15 minutes. Remove from heat and measure pulp, about 4 cups. Add sugar and boil 7 to 9 minutes.
Peaches	5½-6	4-5	2	—	Add ingredients and stir until sugar dissolves. Follow directions 4-8 on page 5.
Strawberries	8	6	—	—	Add ingredients and stir until sugar dissolves. Follow directions 4-8 on page 5.
Wild plums	3	6	—	1 box powdered	Combine fruit and sugar. Let stand about 20 minutes, stirring occasionally. Boil powdered pectin and water rapidly for 1 minute, stirring constantly. Remove from heat. Add the fruit and stir about 2 minutes.

\* Berries include blueberry, huckleberry, boysenberry and raspberry.

TABLE 5: Extracting Juice, Making Jelly and Making Syrup with Select Fruit. See pages 2 and 5 for detailed instructions.

Fruit	Extracting Juice			Making Jelly						Making Syrup (mix ingredients and boil)				
	Water per pound of fruit (cups)	Cooking time (minutes)	Juice (cups)	Sugar (cups)	Pectin	Lemon juice	Directions	Juice (cups)	Sugar (cups)	Corn syrup	Lemon juice	Pectin*	Boiling Time (minutes)	
Apples	1	20 to 25	4	3	---	2 Tbsp	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	4	---	¼ cup	½ pkg	2	
Blackberries	¼	5 to 10	4	3	---	---	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	4	---	¼ cup	---	Simmer only	
Chokecherries and Juneberries (Serviceberries)	Water to cover	15	3	6½	1 bottle liquid	---	Add sugar and stir to mix. Place on high heat. Bring to a boil, stirring occasionally. Stir in pectin. Bring to a full, rolling boil and boil hard for 1 minute, stirring constantly. Remove from heat, and skim off foam. Add ¼ teaspoon almond extract.	4	4	---	½ cup	½ pkg	2	
Crabapples	Water to cover	20 to 25	4	4	---	---	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	4	---	¼ cup	½ pkg	2	
Gooseberries	¼	5 to 10					Add sugar to juice. Boil until mixture reaches 200-220°F, or until jelly sheets from spoon (Figure 1, page 5). Remove from heat, skim off foam.	4	4	---	¼ cup	½ pkg	2	
Grapes	None or ¼	5 to 10	4	3	---	---	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	3	---	¼ cup	½ pkg	2	
Highbush cranberries	3	3 to 5	2	1½	---	---	Measure juice, add sugar and stir well. Boil over high heat until jelly sheets (Figure 1, page 5) from spoon or 200-220°F. Remove from heat, skim off foam.	4	4	---	¼ cup	½ pkg	2	
Rose hips	Water to cover	15	4	7½	1 bottle	---	Measure juice and stir in sugar. Place on high heat, stirring constantly. Bring to a full, rolling boil. Add pectin and heat to full boil. Boil hard for 1 minute. Remove from heat, skim off foam.	2	2	---	---	---	5	
Sandcherries	¼	10 to 15	3½	3½	1 pkg powder	---	Mix pectin into juice. Place over high heat and stir until mixture comes to a hard boil. Immediately add sugar and stir. Bring to a full, rolling boil and boil hard for 1 minute, stirring constantly. Remove from heat, skim off foam	4	4	---	¼ cup	½ pkg	2	
Wild grapes	1	5 to 10	6	7½	1 pkg powder	2 Tbsp	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	4	---	¼ cup	½ pkg	2	
Wild plums	½	15 to 20	4	3	---	---	Mix. Boil until jelly sheets from spoon (Figure 1, page 5).	4	4	---	¼ cup	½ pkg	2	
Other berries	None or ¼	5 to 10					All other berries not listed in this chart require additional pectin. See pectin package for directions.	1¼	1½	¼ cup	1 Tbsp	---	1	