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## Jams and Jellies: Safe Steps to Sweet Success



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So, let's turn our attention to a product that is not only easy to make, but is often a favorite of summer.

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### Definitions

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- **Jam** – made from cooking crushed or chopped fruit(s) and sugar to be spreadable, firm, but not hold shape.
- **Jelly** – made from strained fruit juices and sugar, prepared to be crystal clear, shimmering, holds shape.

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### Definitions

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- **Marmalade** – soft jelly with pieces of fruit, citrus peel, suspended in it, having the texture of jam.
- **Conserves** – jam like product with fruit, nuts and or raisins added. Cooked until rounds up on spoon.
- **Fruit Butters** – slow cooked fruit pulp and sugar. Spices may be added. Cooked until rounds up on spoon.
- **Preserves** – fruit pieces in syrup or soft gel. Does not hold shape.

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**Nutrition**

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**Traditional**

- High sugar content
- High calorie
- 1 tablespoon 50 - 55 calories
- Use sparingly

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**Nutrition**

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**Low or No Sugar Options**

- Reduce Calories – Four Methods

1. Special Modified Pectin
2. Regular Pectin Special Recipes
3. Unflavored Gelatin Special Recipes
4. Long Boil Methods

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See page one of Preserving Jelly Products without added sugar.


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**Jams and Jellies**

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As easy as  
1,2,3,4...

- Fruit
- Pectin
- Acid
- Sugar



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Start with 4 basic ingredients:

**Fruit** gives each product its characteristic color and flavor. Use at least some flavorful, just-ripe fruit in each recipe. You may also be able to use canned, frozen or dried fruit. Use canned or frozen fruits preserved without sugar. Thaw frozen fruit in the refrigerator before using. Cook dried fruit in water until tender and use to make jams and preserves.

**Pectin** is the natural plant substance that causes fruit to gel, and there are many options available now for pectin (more on that later).


**Acid** is essential in jellied fruit products for both gel formation and flavor. The acid content varies among fruits, and is higher in under-ripe fruits. For best

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**Fruit**

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- ❑ The Base - provides color and flavor
- ❑ Natural Pectin – provides some or all
- ❑ Selection - ripe and good quality
- ❑ Canned or frozen fruit or juice without sugar



quality, add bottled lemon juice to fully ripened, low-acid fruits according to tested recipes.

**Sugar** is another essential ingredient in jellied fruit products. Added sugar preserves fruit, helps the gel form, and contributes to flavor. Use the amount of sugar a recipe calls for, or the product will not form a gel. To make a low-sugar or no-sugar product, choose a pectin or research-tested recipe designed for this. Sugar substitutes — also called artificial sweeteners — cannot replace sugar in regular recipes because the sugar is needed to form a gel.

Fruits of irregular size and shape can be used as long as they are good quality, since they will be cut-up, mashed or made into juice. Canned or frozen fruits or juices can be used and it is best if canned “in own juice” or frozen without sugar. Because commercially canned and frozen fruits are made from fully ripened fruits (which are lower in pectin) commercial pectin must be added. If you freeze your own product and want to add sugar, record the proportion of fruit to sugar.

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**Pectin**

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- ❑ Provides the structure or gel
- ❑ Low pectin
  1. over-ripe fruits
  2. strawberries, cherries, blueberries, peaches, apricots, raspberries, blackberries, pineapple
- ❑ High pectin
  1. under-ripe and ripe fruit
  2. apples, crabapples, gooseberries, plums, grapes, cranberries, quinces, red currants

Low pectin - fruits listed can be combined with a fruit high in pectin or with a commercial pectin.

High Pectin - Fruits such as apples, crabapples, gooseberries, some plms, grapes, high bush cranberries, quinces, red currants- contain enough natural pectin to form a gel; others require added pectin. Other high pectin fruits include ;

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**Testing Ingredients**

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**Pectin**  
1 tablespoon rubbing alcohol  
+ 1 teaspoon juice  
Mix for 2 minutes

Good Solid Mass – enough natural pectin present  
Small Weak Mass – not enough natural pectin present need commercial pectin

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**Commerical Pectins**

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- Fully ripe fruit can be used
- Cooking shorter or no-cook
- Yield greater
- Follow package directions
- "Use by" date on package
- Store in cool dry place

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Preferred by many consumers because of 1 – 3 points. You can add pectin to any fruit to ensure a good gel, and there are several advantages for doing so: You can use fully ripe, flavorful fruit. Cooking time is shorter so you retain more of the natural color and flavor of the fruit. You will have more jars on the shelf from the same amount of fruit.


Recipes in package are tested for that specific pectin. Pectin should not be held over year to year...So Easy to Preserver – Fourth Edition.

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**Pectin Types**

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- Liquid & powdered pectins – not interchangeable
- Low-methoxyl pectins for low- or no sugar products
- Powdered gelatin for refrigerator products



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Regular pectins work with sugar, fruit and acid to form a gel. Regular pectin comes in two types, liquid (such as Certo) and powdered (such as Sure-Jell). Liquid pectin is added to a hot pre-cooked mixture of sugar and fruit and cooked for 1 more minute; powdered pectin is cooked with fruit, then sugar is added and the mixture is cooked for 1 more minute. The two types of pectin are not interchangeable.

Low-methoxyl pectins are chemically different from regular pectins and can gel with little or no added sugar. The

resulting gel will be softer, but this can be acceptable for those on a low-sugar or no-sugar diet. The product also tends to be less sweet, and to have a fruitier taste. Even commercial manufacturers are taking advantage of this type of gelling agent to product high quality products.

No sugar refrigerator products may call for powdered gelatin as the gelling agent. Powdered gelatin is a protein, unlike pectin which is a carbohydrate. Gelatin must be treated carefully or the gel structure will break. So, do not freeze these jellies and do not can these products. Store them in the refrigerator.

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**Acid**

- ❑ Needed for gel formation and flavor
- ❑ ph value of below 3.5 needed for jelly
- ❑ Highest in under-ripe fruits
- ❑ Low acid fruits add bottled lemon juice or citric acid.

Acid is added for gel success and flavor. If fruit is not acidic enough, a gel will not form. If too acidic, the jelly will lose liquid and weep. Acid is essential in jellied fruit products. Sometimes the acid comes from under-ripe fruit, and sometime it is added in the form of bottled lemon juice. Freshly squeezed lemon juice won't necessarily work as well.

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**Testing Ingredients**


- ❑ **Acid**  
Mix 1 teaspoon lemon juice  
+ 3 tablespoons water  
and ½ teaspoon sugar

Compare tartness of above mixture to the fruit juice to be used. If fruit juice is not as tart, acid needs to be added (1 tablespoon bottled lemon juice to each cup juice).

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**Sugar**

- ❑ Needed for gel, flavor, preservative
- ❑ 55% percent by weight
- ❑ Measure carefully
- ❑ Use honey or corn syrup sparingly
- ❑ Sugar substitutes  
special recipes



Added sugar preserves jellied fruit by inhibiting the growth of microbes, helps form the gel, and adds flavor too! Measure sugar carefully and do not reduce the amount in the recipe. Beet and cane sugar will work equally well. Using brown sugar is not recommended because of the dark color it imparts to the finished product. Honey or light corn syrup can be used, but remember that liquid ingredients must be adjusted accordingly. These sweeteners will also impart a stronger flavor and color to jellied fruit products.

There are a wide variety of sugar substitutes available on the market. These can NOT substitute for sugar if using regular pectin, but can be used to add sweetness when making jams and jellies with low-methoxyl pectin. Sugar substitutes such as sucralose (Splenda) and saccharin (Sweet-n-Low) tend to hold up well during heating. Follow the manufacturer's directions for using these products. Do not use aspartame (Equal or Nutrasweet) as the resulting product will be unsatisfactory.

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**Tips for Success**

- ❑ Use research based information, tested recipes, processing methods.
- ❑ Organize equipment & ingredients.
- ❑ Measure carefully.
- ❑ Follow manufacturer's directions for pectin and two piece lids.
- ❑ Ask questions.
- ❑ Start simple.

Important to get organized before you start the process. Old canning recipes, families, friends, old methods and steps missing – discard. Measure using right equipment – liquid measuring cup for liquids – juices. Straight edge to level off sugar in a dry measuring cup. Ask questions of research based organizations or canning companies. Start simple – basic equipment and no-cook products.

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### FOR PREPARING

Large Bowl for holding juice

Colander to wash fruit

Jelly Bag, unbleached muslin or cotton flannel with nap side turned in, four layers of cheese cloth. Jelly bags and cloths should be damp when extracting juice.

Knife for paring and peeling.

Potato masher for crushing fruit.

Rubber or plastic gloves for working with hot peppers or fruits that really stain hands.

Saucepan with large cover for preparing fruit or juice.

Measuring cups, spoons, scales.

### FOR COOKING

Saucepan with flat bottom, heavy metal works best to prevent scorching. Four times as large as quantity of product.

Spoon with long handle for stirring mixtures.

Thermometer candy or deep fat – for determining doneness of product with no pectin added.

Timer or watch to time the boil

Wire Whisk for stirring in powdered pectins into fruit mixture to avoid lumps.

### FOR CANNING AND FREEZING

Canning jars with two piece lids – standard half pint with vacuum seal lids and metal screw bands are the safety.

Funnel wide or regular mouth for filling containers.

Ladle – for loading into jars or containers

Plastic containers – 1 – 2 cup size with tight fitting lids for freezer or refrigerator

Pot Holders

Small dish with metal spoon or jelly skimmer for skimming off foam.

### FOR PROCESSING

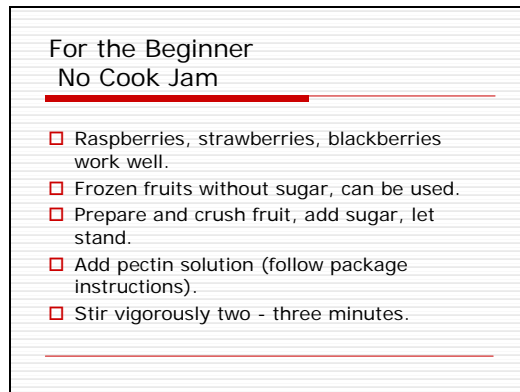
Boiling water bath canner with rack

Labeling Supplies

Lid and Jar Lifters for handling hot jars

Wire rack or folded towels for cooling process.

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For the Beginner  
**No Cook Jam**

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- Pour in clean freezer containers, ½ inch headspace.
- Sets in 24 hours.
- Keeps in refrigerator for 3 weeks or 1 year in freezer.
- Thaw in refrigerator 24 hours.

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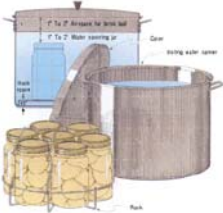
Don't freeze too soon – gel will not form if before 24 hours.

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**Water Bath Processing**

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**A MUST for jams and jelly**



The diagram shows a water bath canner with a lid and a rack. Inside the canner, there are several jars. Labels include '1 To 2 Pints for 10-12 jars', '2 To 2 1/2 Quarts for 12-15 jars', 'Rack', 'Lid', and 'String with laces'.

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Many consumers wonder why they need to water bath can jams and jellies, especially when the pectin packages that they buy in the store suggest that inverting the hot-filled jars is sufficient. Well, there are several good reasons for water bath canning:

helps form of a good seal on a product destroys yeast and mold which might be present on the rim or lid and thus increases shelf life (it's really a pasteurization process) is required for any item entered in competition or if being sold

Because of their high sugar content, jams and jellies will not readily support the growth of microorganisms; and certainly not when they are sealed with a vacuum seal. But once the jars are opened, then microbial growth can begin. By putting jars through a water bath process, the jars are more likely to seal and to resist mold and yeast growth once opened.

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### Water Bath Processing

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- Wash ½ pint canning jars - hot water and detergent or in dishwasher.
  - Presterilize – submerge (1-2 inches above) in boiling water. Boil 10 minutes. Jars can remain in hot water until ready to fill.
  - Prepare two piece lids - package directions.
  - Drain and fill jars one at a time. Wipe rim.
  - Adjust two piece canning lids.
  - Work **carefully** but quickly.
- 

Cleaning and sanitizing very important for a safe end product. This process takes some physical coordination and you must be very careful since you are working with hot water and hot jelly or jam. This is not a time to have small children underfoot, or distractions of phone or tv...stay focused!

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### Water Bath Processing

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- Load filled jars in canner one at a time.
  - Rack on bottom.
  - Jar lifter – careful not to tilt jar.
  - Boiling water 1 – 2 inches above jars.
  - Process 5 – 6 minutes after water boils – heat on high and cover on.
  - Process 10 minutes unsterilized jars.
  - U of M research 15 minutes processing safe.
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### Water Bath Processing

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- Remove jars – upright on towel or rack.
  - Cool 12 – 24 hours undisturbed.
  - Remove ring bands from sealed jars.
  - Unsealed jars in refrigerator or freezer.
  - Remove any residue from jar. Label.
  - Store in cool, dry place, out of light.
  - Keeps one year.
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Keeps one year if you can keep it on the shelf that long...usually eaten first and goes quickly.

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**Unsafe Processing Method**

**Inversion** – fill jar with hot product and turn jar upside down on its lid.

- a. weak seal likely to fail in storage
- b. headspace retains oxygen to allow mold growth
- c. undesirable color - flavor changes
- d. leaking of product - burning + waste

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**Unsafe Processing Method**

**Wax** – paraffin wax melted and poured on top of product to seal.

- a. pinholes, shrinkage or cracks allow airborne molds to contaminate and grow...or
- b. product can seep out and mold can grow on surface and within

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**When Things Don't Work**

- Use as syrup or topping
- Remake – affects color and flavor
- Small Batches
- Carefully measure
- Directions
  1. Powdered Pectin
  2. Liquid Pectin
  3. Without Pectin

Sometimes, regardless of how careful you are, jams and jellies refuse to set. Most any jellied fruit product makes great syrup, but sometimes jam or jelly is all that is acceptable. Consumers can try to re-make jams and jellies, although the resulting product will be darker in color and may have more of a cooked flavor.

In general, re-cooking of jams and jellies that don't set will be most successful if:  
You work in small batches  
You carefully measure all ingredients  
You add pectin to the product as you are re-cooking


See pages 14-15 of the Jams and Jellies publication for hints on successfully

remaking Jams and Jellies.

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When Things Don't Work  
Refrigerator or Freezer Jams

- Use as syrup or topping
- Too firm – soften by stirring
- Separates – stir until blended
- Too thin – boil in saucepan for 1 minute



Remember to keep product in refrigerator for 24 hours before freezing for proper gel.


A great product on pound or angel food cake, drizzled over fresh fruit cup, elegant garnish on plate before adding dessert.

If the jam is too firm you can easily soften by stirring. If it tends to separate, stirring will blend it again. If freezer jam is too soft, bring it to a boil for 1 minute in a saucepan on top of the range and it will thicken as it cools.

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When Things Don't Work  
Trouble Shooting

- Crystals in jelly
- Bubbles
- Cloudiness
- Soft or runny
- Sticky, gummy or tough
- Loss or change of color
- Mold and Fermentation




Everyone who has answered questions about jams and jellies has been confronted with questions such as: Cloudy Jelly -

Why does the fruit float at the top of my jam? Fruit will have less of a tendency to float if it 'soaks' in sugar and if sufficient air is released; both not usually an option in the rapid cooking process when making jams with added pectin. So.. Consider stirring the cooked fruit/pectin/sugar mixture for 5 minutes off the stove before ladeling into jars. This will help fruit to settle throughout the product.

Is moldy jam safe to eat? If kept too long in the refrigerator, or on the counter, jam, jelly and other fruit products will eventually mold. Current

USDA recommends are to discard all moldy product. Be sure to start with pre-sterilized jars and pre-treated lids. Be sure to include a water bath processing step as part of your process. And be sure that the water bath covers the top of the jars by at least 1 inch during processing. Why is using paraffin not recommended? Paraffin does not form as tight a seal as water bath processing and is no longer recommended.

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**Resources** 

- U of M Extension Service Info U  
1.800.525.8636  
[www.extension.umn.edu/info-u](http://www.extension.umn.edu/info-u)
- U of M Extension Service Food Safety website  
[www.extension.umn.edu/foodsafety](http://www.extension.umn.edu/foodsafety)
- National Center for Home Food Preservation  
[www.uga.edu/nchfp](http://www.uga.edu/nchfp)
- E-Answers (website Extension nationally)  
<http://128.227.242.197/>
- U of M Extension Service and Iowa Extension AnswerLine 1.800.854.1678

Freezing Fruits and Vegetables B3278  
Making Jams, Jellies and Fruit Preserves B2909

And the National Center for Home Food Preservation:

How do I...  
Freeze?  
Make Jam and Jelly?  
<http://www.uga.edu/nchfp/index.html>

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**Resources** 

- Alltrista Corporation (Ball and Kerr products)  
1.800.240.3340  
<http://www.homecanning.com>
- Kraft Foods  
1.800.323.0786  
<http://www.surejel.com>
- Kitchens Krafts (bulk pectin – regular and lite)  
1.800.776.0575  
[www.kitchenkrafts.com](http://www.kitchenkrafts.com)

Freezing Fruits and Vegetables B3278  
Making Jams, Jellies and Fruit Preserves B2909

And the National Center for Home Food Preservation:

How do I...  
Freeze?  
Make Jam and Jelly?  
<http://www.uga.edu/nchfp/index.html>

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Ahhh...Sweet Success!

- "The jars all sealed!"
- "The jars look beautiful!"
- "It's so nice to have a treat in the freezer."
- "It tastes so good...!"

*Wishing you Safe Steps to Sweet Success!*

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Jams and Jellies:  
Steps to Sweet Success

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