All About Pectin

University of California Agriculture and Natural Resources

UCCE Master Food Preserver Program
Sacramento County
Disclaimer

- Use of trade or brand names is for clarity and information only; it does not imply approval of product to exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant standard of the product.
What is pectin?

- Substance that causes fruit to gel
- Some kinds of fruits have enough natural pectin to make high-quality products
- Others require added pectin, especially when they are used for making jellies, which should be firm enough to hold their shape
- Just-ripe fruit have the highest quality pectin; under- or over-ripe fruit will not form a gel
Where is pectin found?

- Apples (sour)
- Blackberries
- Cranberries
- Lemons
- Plums
Home preservation of jams and jellies dates back to 18th century. Common fruits from that era that were preserved include apple, currant, and quince (all have high level of naturally occurring pectin). People began to mix these high-pectin fruits with other fruits that didn’t set well. Today, commercial pectin is used in jams, jellies, frozen foods, candies, and low-calorie foods as a fat or sugar substitute (pectin produced for home use is a small section of commercial pectin industry).
Safety

- Fruit spreads prepared by traditional pectin-gelled process are low risk for growth of spoilage organisms and pathogens
  - Low water activity (as a result of high sugar content)
  - High acidity (thus low pH—3.0 to 3.3)
- When spoilage does occur, it’s usually from
  - Mold growth (processing eliminates air and kills mold spores, thus preventing mold growth)
  - Yeast growth (can be inhibited by processing in a boiling water canner)
- Fruit spread made from vegetable base, like pepper jelly?
  - Traditional pectin-added recipes have sufficient acid added to bring final product to pH range of 3.0-3.3 (usually added in form of vinegar)
Commercial Pectin

- Made from apples or citrus fruit
- Available in the following forms:
  - Powdered
  - Liquid
  - High-sugar
  - Low- and no-sugar
- Safety
  - Follow the manufacturer’s directions or tested recipes when using
  - Powdered and liquid forms are not interchangeable in recipes
- May be used with any fruit
- Some consumers prefer added pectin:
  - Fully ripe fruit can be used
  - Cooking time is shorter and is set so there is no question when the product is done
  - Yield from a given amount of fruit is greater (Note: Because more sugar is used, the natural fruit flavor may be masked)
- Should be stored in a cool, dry place so it will keep its gel strength
Types of pectin

- Regular or high-methoxyl (HM) pectin
- Modified or low-methoxyl (LM) pectin
- Amidated pectin (form of LM pectin)
Regular, traditional, or high-methoxyl (HM) pectin

- Requires sugar and acid to form gel matrix (also known as “acid-gelled” pectin)
- Begins as long carbohydrate strands, which form a gel matrix, bonding with themselves at several junctions, trapping water
- Ingredients must be added in right amount at the right time, in the right order; heating concentrates the sugar, enhancing bond formation
- Needs acid and sugar to create gel
- Disadvantages
  - High sugar
  - Cannot be reheated
  - Very limited shelf life
  - Cannot tweak recipe (doubling/halving)
- Common brands
  - Sure-Jel
  - Ball
  - Mrs. Wages
  - Certo
Modified or Low-Methoxyl (LM) Pectin

- Requires calcium to create gel, not sugar
- Can double/halve batches
- Acidity levels are more variable (range 3.0-7.0)

Disadvantages
- Less sugar may result in softer jam set
- Color and texture are not preserved as well as when using HM
- Refrigerator life after opening is short; may mold
- Reduced- and no-sugar spreads can spoil more easily due to lower water activity

Common brands
- Sure-Jell (pink box)
- Mrs. Wages Lite Home Jell
Amidated Pectin (form of LM pectin)

- Needs less calcium to work (more tolerant of excess calcium)
- Thermo-reversible (may reheat product and when cooled, will solidify again)
- Common brands
  - Ball Low or No-Sugar Needed (calcium added)
  - Pomona’s Pectin (calcium powder included in package with directions for use)
Benefits of Using Commercial Pectin

- High yield per measure of fruit or juice
- Shorter cooking time
- Preserves “fresh” taste of fruit
- Uniform results (no guesswork)
- Pectin gel is considered the gold standard by which all other gelled products are compared for quality, taste, and texture
Homemade Pectin

- Tart, under-ripe apples
- Crab apples
- Thick, strained liquid is pectin
- Use in place of commercial liquid pectin

Advantages
- Good use of extra apples or apple by-products
- May be organic or pesticide free
- Lower cost

Disadvantages
- Time-consuming to make
- Results may differ (inconsistent)
Other Options

Clear Jel, a cornstarch derivative

**Advantages**
- Clear, excellent stability
- No sugar required to thicken
- May be reheated

**Disadvantages**
- Majority of recipes written for pectin
- Using as a substitute for pectin is not an exact science
- Noticeably different consistency than jam made with pectin
Other options

- Vegetable gums: pop for thickening fruit-based products, found as ingredient in numerous commercial food products, including xanthan gum and locust bean gum.

- Agar flakes: polysaccharide derived from seaweed used as jelling agent; flakes are most convenient for jellies or jams. Avail in most health food stores.

- Starch-based thickeners: subbed for pectin when thickening fruit spreads; some contain maltodextrin, a starch type thickener to aid in gelling. Clear-Jel and Instant Clear-Jel are popular brands.

- Gelatin: protein substance derived from collagen, sometimes used to make unsweetened jams/jellies. Not heat processed, must be stored in fridge. (recipes for spreads made w gelatin can be found in Complete Guide to Home Canning (USDA 2009))
Commercial Jelling Agents

- Certo
- Sure Jell
- Sure Jell Light
- Can-Jel
- Slim Set
- Ball 100% Natural Reduced Calorie Fruit Pectin
- Mrs. Wage’s Light Home Jell
- Kerr Pure Fruit Pectin (lite)
How to stay safe

- Pectin manufacturers have developed recipes with attention to final pH of product
- Follow preparation and processing instructions include inside pectin packages
- Select recipes from reputable sources, such as USDA, major canning company, or pectin manufacturer
What to make?

- Refrigerator/freezer spreads
- Regular pectin w special recipes
- Fruit spreads
- Jellied products
- Jellies, jam, preserves, conserves, marmalade
- Reduced- and no-sugar fruit spreads
Resources

- WA State University, Skagit County Extension
- So Easy to Preserve, Cooperative Extension, The University of Georgia © 2014, sixth edition
- Fundamentals of Consumer Food Safety and Perseveration, UC Master Food Preserver Program, Wash State University, UCANR