



**University of California**  
Agriculture and Natural Resources

UCCE Master Food Preserver Program  
Sacramento County

# All About Pectin

University of California Agriculture and Natural Resources



# 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.
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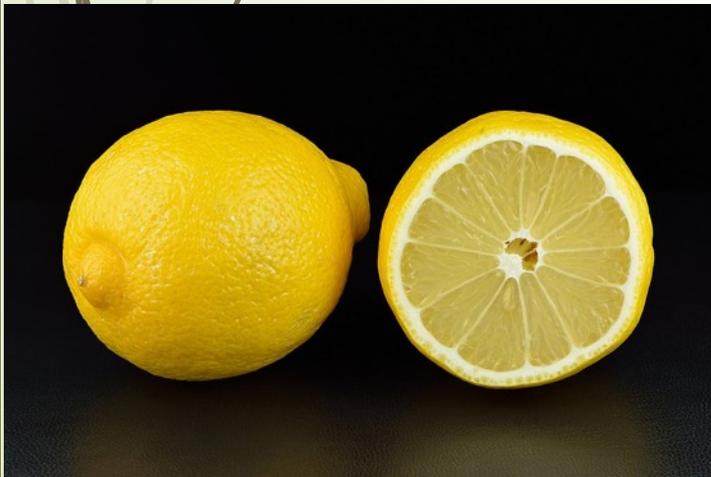


# What is pectin?

- ▶ 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
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# Where is pectin found?

- Apples (sour)
- Blackberries
- Cranberries
- Lemons
- Plums



# History

- Home preservation of jams and jellies dates back to 18<sup>th</sup> 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)
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# 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
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# 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





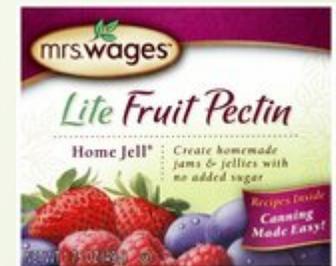
# Other options



- ▶ 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
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# 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
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# 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