

“Standards of Identity for Jams, Jellies, Preserves & Fruit Butters”

CODE OF FEDERAL REGULATIONS TITLE 21
PART 150



Jeanne-Marie Weathers, REHS
Retail Food Program Specialist
California Department of Public Health
Food and Drug Branch

COTTAGE FOODS AND 21 CFR 150

California Homemade Food Act

(AB1616 -Gatto) became effective January 1, 2013.

Established an Approved Cottage Food List:

Jams, jellies, preserves, and fruit butters are an allowed food category only if product complies with Part 150 of Title 21 of the Code of Federal Regulations.



21 CFR 150: DEFINITIONS AND STANDARDS OF IDENTITY

- Prescribes safe and suitable ingredients to prevent the formation of pathogens and toxins such as *Clostridium botulinum*.
- Prescribes definitions and standards of identity for fruit butters, jellies, artificially sweetened jellies, jams or preserves, and artificially sweetened jams or preserves.



Wellcome Images

KEY POINTS

WHY Is This Important?

- Finished product is high in sugar, high in solids, and low pH to be a safe food product
- Safe and suitable ingredients are used
- Product is what it is supposed to be and the consumer is getting what they expect.
 - *A fraudulent example would be ingredients substituted with cheaper ingredients (i.e. pectins and sugars with additional food color in lieu of the more expensive fruit ingredients)*
- Labeling is truthful



- Products that are made with other ingredients that are not defined in 21 CFR 150 cannot be produced by cottage food operations.
- Addition of other ingredients or alteration of ingredient profiles changes the chemistry of the food, which can allow the growth of various bacteria and toxins under the right conditions.
- Refer to CDPH for information on obtaining a Processed Food Registration and possibly a Cannery License (916-650-6500).

Email : FDBInfo@cdph.ca.gov

For example:

Addition of peppers (i.e. jalapeno pepper) to make pepper jelly is not supported by 21 CFR 150 and the addition of this low acid ingredient could cause the formation of botulism toxin in the product if the proper controls are not used.



DEFINITIONS

- Fruit: edible ovary of the plant and listed in 21 CFR150
- Concentrated fruit: concentrate made from the properly prepared edible portion of mature fresh or frozen fruits by the removal of moisture with/without the use of heat or vacuum but not to the point of drying. Canned or frozen without sugar or other sweetening ingredients so as to properly calculate the weight (soluble solids-Brix).
- Fruit juice: liquid that is naturally contained in fruit
- Diluted fruit juice: when water is added to fruit juice to make the flavor less potent. Sometimes juice is taken from concentrate, so the process of dilution is commonly used with many fruit juices we can buy in the stores.
- Concentrated fruit juice: the removal or reduction of water resulting in fruit concentrate

SWEETENERS

Nutritive carbohydrate sweeteners:

Nutritive sweeteners are those that provide calories or energy in the form of carbohydrates.

- Examples of Nutritive sweeteners: include sucrose, high fructose corn syrup, corn syrup, honey, fructose, molasses, and sugar alcohols such as sorbitol and xylitol.
- Saccharine means sugar.



SWEETENERS

Non-nutritive sweeteners: Substances having less than 2 percent of the caloric value of sucrose per equivalent unit of sweetening capacity, do not provide calories and are sometimes referred to as artificial sweeteners.

- Saccharin is a non-nutritive artificial sweetener.
- There are other non-nutritive sweeteners but are not listed as an approved optional ingredient in 21 CFR 150.



SPICES

The term *spice* means any aromatic vegetable substance in the whole, broken, or ground form, except for those substances which have been traditionally regarded as foods, such as onions, garlic and celery; whose significant function in food is seasoning rather than nutritional; that is true to name; and from which no portion of any volatile oil or other flavoring principle has been removed.



SPICES

No standard of identity for spices. Spices include the spices listed in 21 CFR 182.10 and part 184, and CPG Sec. 525.750 (Spices) such as the following:



Allspice, Anise, Basil, Bay leaves, Caraway seed, Cardamom, Celery seed, Chervil, Cinnamon, Cloves, Coriander, Cumin seed, Dill seed, Fennel seed, Fenugreek, Ginger, Horseradish, Mace, Marjoram, Mustard flour, Nutmeg, Oregano, Paprika, Parsley, Pepper, black; Pepper, white; Pepper, red; Rosemary, Saffron, Sage, Savory, Star aniseed, Tarragon, Thyme, Turmeric.

FLAVOR

Flavor - the sensory impression of a food or other substance, and is determined mainly by the chemical senses of taste and smell.



FLAVOR

Natural flavor: means the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional. Natural flavors include the natural essence or extractives obtained from plants listed in 21 CFR 182.10, 182.20, 182.40, and 182.50 and part 184 of this chapter, and the substances listed in 172.510.

Artificial flavor: the function of which is to impart flavor, which is not derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, fish, poultry, eggs, dairy products, or fermentation products thereof. Artificial flavor includes the substances listed in 21 CFR 172.515(b) and 182.60 except where these are derived from natural sources.

OTHER OPTIONAL INGREDIENTS

Pectin: any of various water-soluble substances that bind adjacent cell walls in plant tissues and yield a gel which is the basis of fruit jellies, or a commercial product rich in pectin and used chiefly in making jelly and other foods.

Preservatives: any chemical that, when added to food, tends to prevent or retard deterioration but does not include common salt, sugars, vinegars, spices, or oils extracted from spices

Examples of preservatives: benzoic acid, ascorbic acid, calcium propionate, potassium sorbate, sodium benzoate

Salt: Any salt (sodium chloride) used as an ingredient in food shall be declared by its common or usual name "salt."

Acidifying agents: cuts the sweetness of the sugar and achieves the necessary pH

- Commonly used acidifying agents: citric acid (natural fruit acid – lemon), malic, fumaric, tartaric (used in wine), and lactic

Antifoaming agents: Substances used to modify surface properties of liquid food components for the effect of reducing foaming

pH control agents : Substances added to change or maintain active acidity or basicity, including buffers, acids, alkalis, and neutralizing agents (i.e., citric acid).

Buffering agents: Substances that prevent a change in pH, salts of weak acids or bases (i.e., sodium citrate added to food with citric acid to maintain a constant acidity/exist in equilibrium).

STANDARDIZING EQUIPMENT

pH meter: measures the pH

Refractometer: measure degrees BRIX (also referred to as fruit sugar. % sugar, or soluble solids in the regulation)

Examples of Refractometers



✧ Purchase on internet from approximately \$30.00 upwards.

CALCULATION OF THE WEIGHT OF THE FRUIT COMPONENT (EXAMPLE):



Fruits, fruit juice concentrates, purees, etc. it is difficult to tell what the soluble solids (degrees Brix or % sugar) is so a standard has been set to help calculate it for each different type of optional fruit ingredient:

- Measure brix of fruit ingredient (juice or fruit)
- Multiply by weight of ingredients
- Divide by a hundred
- Multiply by designated factor listed in 21 CFR 150
- Times by ratio (i.e., 45:55 weight of juice to weight of sugar) to get total necessary sugar
(Avoirdupois: measured in ounces or pounds.)

CALCULATION EXAMPLE:



Measure Brix of 100 lbs of apple concentrate = 40 degrees Brix

Weight of ingredients= 100 lbs of apple concentrate

$$(100 \times 40)/100 = 4000/100 = 40 \text{ solids}$$

Multiply by factor for apple juice

$$40 \times 7.5 = 300 \text{ lbs single strength juice}$$

Standard prescribed for fruit solids to sugar in jelly is

45 weight juice:55 weight sugar (45:55) or 1.22

$$300 \times 1.22 = 366 \text{ lbs of sugar may be added}$$

300lbs fruit solids:366 lbs sugar

Measure final Brix and it should be 65% or cook off excess water until reaching required final Brix is achieved.

FRUIT BUTTERS

The smooth, semisolid foods each of which is made from a mixture of one or a permitted combination of the optional fruit ingredients and weight of each not less than 1/5 of the weight combination:

- Five parts by weight fruit ingredient to each two parts by weight of nutritive carbohydrate sweeteners
- The finished soluble solids content not less than 43%

-apple
-peach
-prune

-apricot
-pear
-quince

-grape
-plum



FRUIT BUTTER OPTIONAL FRUIT INGREDIENTS AND FACTORS:

Apple	7.5
Apricot	7.0
Grape	7.0
Peach	8.5
Pear	6.5
Plum (other than prune)	7.0
Prune	7.0
Quince	7.5

FRUIT BUTTER INGREDIENTS



Safe and suitable optional ingredients:

- Nutritive carbohydrate sweeteners
- Spice
- Flavoring (other than artificial flavoring)
- Salt
- Acidifying agents
- Fruit juice or diluted fruit juice or concentrated fruit juice, in a quantity not less than $\frac{1}{2}$ the weight of the optional fruit ingredient
- Preservatives
- Antifoaming agents (except those made from animal fats)
- Pectin (in quantity which reasonably compensates for deficiency of natural fruit pectin of the fruit ingredient).

LABELING OF FRUIT BUTTERS

Each ingredient used shall be declared on the label as required by 21CFR101 and 21CFR130

Single Fruit Butter Label

“Name” of Fruit and then “Butter”

Examples:

- *Apple Butter*
- *Olallieberry Butter*
- *Passion Fruit Butter*

Combination of 2,3,4,5.Fruit Butter Label

“Mixed Fruit” and then “Butter”
In order of predominance if each fruit is listed before “butter”

Examples:

- *Mixed Fruit Butter*
- *Cranberry Apple Butter*

- Form of fruit does not have to be listed (i.e. canned, fresh, or frozen etc.) unless it is “dried” or “evaporated”
- If dried or evaporated fruit is used then the label shall bear the words “prepared from” or “prepared in part from” and appear in the order of predominance of fruit ingredients (i.e. “prepared from dried plums”)

FRUIT JELLY



- Jelled foods made from a mixture of one or a permitted combination of the fruit juice ingredients specified in 21 CFR 150.
- Can be concentrated with or without heat
- Flavoring or essence may be captured by concentration, separately concentrated, and added back to mixture together with any concentrated essence accompanying any optional fruit ingredient
- May be filtered or strained liquid extracted with or without the application of heat and with or without the addition of water
- (45:55) Forty-five parts by weight of the fruit ingredient to each fifty-five parts by weight of the sweetener solids
- The finished soluble solids content is not less than 65%
- The combinations of the permitted fruit juice ingredients in which the weight of each is not less than $\frac{1}{5}$ of the weight of the combination

FRUIT JELLY INGREDIENTS

Safe and suitable optional ingredients:

- Nutritive carbohydrate sweeteners
- Spice
- Acidifying agents
- Pectin (in quantity which reasonably compensates for deficiency of natural fruit pectin of the fruit ingredient).
- Buffering agents
- Preservatives
- Antifoaming agents (except those made from animal fats)
- Mint flavoring and artificial green coloring
- Cinnamon flavoring, other than artificial flavoring, and artificial red coloring

LABELING OF FRUIT JELLIES

Each ingredient used shall be declared on the label as required by 21CFR101 and 21CFR130

Single Fruit Jelly Label

“Name” of Fruit and then “Jelly”

Examples:

- *Elderberry Jelly*
- *Passion Fruit Jelly*

Combination of 2,3,4,5.Fruit Jelly Label

“Mixed Fruit” and then “Jelly”

In order of predominance if each fruit is listed before “Jelly”

Examples:

- *Mixed Fruit Jelly*
- *Cranberry Apple Jelly*

- Optional fruit ingredients shall be declared on the label
- Form of fruit does not have to be listed (i.e. canned, fresh, or frozen etc.)
- When acidifying agents, pectin, and buffering agents are declared on the label, the declaration may be followed with “used as needed” on all jellies to which they are customarily, but not always, added to compensate for natural variations in the fruit juice ingredients used.

ARTIFICIALLY SWEETENED FRUIT JELLY

- Jellied foods made from a mixture of one or a permitted combination of the fruit juice ingredients (same fruit juices for jellies) and specified artificial sweetening ingredient: saccharin, sodium saccharin, calcium saccharin, or any combination of the two or more of these.
- No nutritive sweeteners ingredients either indirectly or directly
- The amount of fruit juice ingredient is not less than 55% by weight of the finished food.
- Sealed in containers and so processed by heat either before or after sealing to prevent spoilage.



ARTIFICIALLY SWEETENED FRUIT JELLY INGREDIENTS

Safe and suitable optional ingredients:

- Spice, spice oil, spice extract
- Vinegar, lemon juice, lime juice, citric acid, lactic acid, malic acid, tartaric acid, fumaric acid, or any combination of two or more of these that reasonably compensates for deficiency, if any, of the natural acidity of the fruit juice ingredient
- Sodium citrate, sodium acetate, sodium tartrate, monosodium phosphate, disodium and trisodium phosphate, sodium potassium tartrate, potassium citrate, potassium acid tartrate, or any combination thereof in the amount not exceeding 2-ounces avoirdupois per 100-pounds of the finished food
- Sodium hexametaphosphate not exceeding 8-ounces avoirdupois per 110-pounds of the finished food
- Purified calcium chloride, calcium citrate, calcium gluconate, calcium lactate, calcium sulfate, monocalcium phosphate, potassium chloride, or any combination of two or more of these salts, reasonable quantity to enable jelling ingredients to produce a jellied finished product
- Ascorbic acid, sorbic acid, sodium sorbate, potassium sorbate, sodium propionate, calcium propionate, sodium benzoate, benzoic acid, methylparaben, propylparaben, or any combination of two or more, in a reasonable quantity as a preservative not to exceed 0.1% by weight of finished food

ARTIFICIALLY SWEETENED FRUIT JELLY INGREDIENTS

- Jelling ingredients: pectin, agar-agar, carob bean gum, guar gum, gum karaya, gum tragacanth, align (sodium alginate), sodium carboxymethylcellulose (cellulose gum), methylcellulose, carrageenan or salts of carrageenan.
 - Pectin may be standardized with a nutritive sweetening ingredient but shall not amount to more than 44% by weight of the standardized pectin and the quantity of the standardized pectin shall not exceed 3% of the weight of the finished product.
 - Carrageenan or salts of carrageenan not exceed 25% by weight of the standardized carrageenan and not exceed 2% by weight of the finished food product.

LABELING OF ARTIFICIALLY SWEETENED JELLIES:

Each ingredient used shall be declared on the label as required by 21CFR101 and 21CFR130

“Artificially Sweetened” must be prominently and conspicuously displayed and immediately followed by the name of the jelly for which a standard of identity is prescribed.

Jelling ingredient named on the label by a statement:

“_____ added” or “with added _____” (Example: “pectin and methylcellulose added”)

Spice ingredients:

“____added” or “with added_____” (Example: “spice”, “spice oil”, or “spice extract”)

Preservative ingredients:

“____added” or “with added_____” (Example: “sodium hexametaphosphate added” or “with added sodium hexametaphosphate”)

Preservatives and all others listed in suitable optional ingredients shall bear the statement:

“____added as a preservative”. (Example: “ascorbic acid added as a preservative”)

FRUIT PRESERVES AND JAMS

- The viscous or semi-solid foods, which is made from a mixture composed of one or a combination of the permitted combination of the fruit ingredients specified
- Mature, properly prepared fruits which are fresh, concentrated, frozen, and/or canned.
- The combinations of the permitted fruit ingredients in which the weight of each is not less than $\frac{1}{5}$ of the weight of the combination (except for pineapple not less than $\frac{1}{10}$, apple not more than $\frac{1}{2}$ of the combination)

FRUIT PRESERVES AND JAMS

Divided into two groups: berries and pomes

Berry group: 47:55 Forty-seven (47) parts by weight of fruit component to 55 parts of the sugar



Pomes group: 45:55 Forty-five (45) parts by weight of fruit component to 55 parts of the sugar

Both groups: finished product not less than 65% soluble solids

FRUIT PRESERVES AND JAMS

Group I - Berries

Blackberry (other than dewberry), Black raspberry, Blueberry, Boysenberry, Cherry, Crabapple, Dewberry (other than boysenberry, loganberry, and youngberry) Elderberry, Grape, Grapefruit, Huckleberry, Loganberry, Orange, Pineapple, Raspberry, Red Raspberry, Rhubarb, Strawberry, Tangerine, Tomato, Yellow Tomato, Youngberry



FRUIT PRESERVES AND JAMS

Group II - Pomes

Apricot, Cranberry, Damson, Damson Plum, Fig, Gooseberry, Greengage, Greengage Plum, Guava, Nectarine, Peach, Pear, Plum (other than greengage plum and damson plum), Quince, Red Currant, Currant (other than black currant)



JAMS AND FRUIT PRESERVES INGREDIENTS

Safe and suitable optional ingredients:

- Nutritive carbohydrate sweeteners
- Spice
- Acidifying agents
- Pectin (in quantity which reasonably compensates for deficiency of natural fruit pectin of the fruit ingredient).
- Buffering agents
- Preservatives
- Antifoaming agents (except those made from animal fats)
- Fruit ingredients in the proportions specified:

Group I: 47:55

Group II: 45:55

WEIGHT OF THE FRUIT INGREDIENT

- Exclusive of sugar, water, or other substance added for processing
- Exclusive of pits, seeds, skins, cores, or other parts
- Concentrated fruit – weight used is the weight of the fresh fruit used to make the concentrated fruit





LABELING REQUIREMENTS

- Form of fruit does not have to be listed (i.e. canned, fresh, or frozen etc.)
- Single fruit: “Preserve” or “Jam”
- Combination of 2,3,4,5 fruits: “mixed fruit” and then “preserve” or “jam” (or in order of predominance if each fruit listed before “preserve” or “jam”)
- When optional ingredients listed are used they must be declared on the label: followed by the statement “used as needed” to compensate for natural variations in the fruit ingredients used.
- Marmalade: fruit preserve usually made from citrus fruit and must contain a citrus peel ingredient

LABELING OF JAMS AND PRESERVES

Each ingredient used shall be declared on the label as required by 21CFR101 and 21CFR130

Single Fruit Jam or Preserve Label

“Name” of Fruit and then “Jam or Preserve”

Examples:

- *Blackberry Jam*
- *Strawberry Preserves*

Combination of 2,3,4,5 Jam/Preserves

“Mixed Fruit” and then “Jam or Preserve”

In order of predominance if each fruit is listed before “butter”

Examples:

- *Mixed Fruit Preserves*
- *Three Berry Jam*

- Form of fruit does not have to be listed (i.e. canned, fresh, or frozen etc.)
- When optional ingredients listed are used they must be declared on the label: followed by the statement “used as needed” to compensate for natural variations in the fruit ingredients used.
- Marmalade: fruit preserve usually made from citrus fruit and make contain a citrus peel ingredient

ARTIFICIALLY SWEETENED FRUIT PRESERVES AND JAMS

- Artificially sweetened (saccharin) fruit preserves or artificially sweetened fruit jams, the viscous or semisolid foods made from a fruit ingredient specified preserves and jams
- The amount of fruit ingredient is not less than 55% by weight of the finished food.
- Sealed in containers and so processed by heat before or after sealing to prevent spoilage
- With or without water and a jelling ingredient



ARTIFICIALLY SWEETENED JAMS AND FRUIT PRESERVE INGREDIENTS

Safe and suitable optional ingredients:

- Spice, spice oil, spice extract
- Vinegar, lemon juice, lime juice, citric acid, lactic acid, malic acid, tartaric acid, fumaric acid, or any combination of two or more of these that reasonably compensates for deficiency, if any, of the natural acidity of the fruit juice ingredient
- Sodium citrate, sodium acetate, sodium tartrate, monosodium phosphate, disodium and trisodium phosphate, sodium potassium tartrate, potassium citrate, potassium acid tartrate, or any combination thereof in the amount not exceeding 2-ounces avoirdupois per 100-pounds of the finished food
- Sodium hexametaphosphate not exceeding 8-ounces of the finished food
- Purified calcium chloride, calcium citrate, calcium gluconate, calcium lactate, calcium sulfate, monocalcium phosphate, potassium chloride, or any combination of two or more of these salts, reasonable quantity to enable jelling ingredients to produce a jellied finished product
- Ascorbic acid, sorbic acid, sodium sorbate, potassium sorbate, sodium propionate, calcium propionate, sodium benzoate, benzoic acid, methylparaben, propylparaben, or any combination of two or more, in a reasonable quantity as a preservative not to exceed 0.1% by weight of finished food

JAMS AND FRUIT PRESERVE INGREDIENTS

- Jelling ingredients: pectin, agar-agar, carob bean gum, guar gum, gum karaya, gum tragacanth, align (sodium alginate), sodium carboxymethylcellulose (cellulose gum), methylcellulose, carrageenan or salts of carrageenan.
 - Pectin may be standardized with a nutritive sweetening ingredient but shall not amount to more than 44% by weight of the standardized pectin and the quantity of the standardized pectin shall not exceed 3% of the weight of the finished product.
 - Carrageenan or salts of carrageenan not exceed 25% by weight of the standardized carrageenan and not exceed 2% by weight of the finished food product.

JAMS AND FRUIT PRESERVE INGREDIENTS

Each ingredient used shall be declared on the label as required by 21CFR101 and 21CFR130

“artificially sweetened” must be prominently and conspicuously displayed and immediately followed by the name of the jelly for which a standard of identity is prescribed.

Jelling ingredient named on the label by a statement:

“____ added” or “with added ____” (Example: “pectin and methylcellulose added”)

Spice ingredients:

“____added” or “with added____” (Example: “spice”, “spice oil” or “spice extract”)

Preservative ingredients:

“____added” or “with added____”(Example: “sodium hexametaphosphate added” or “with added sodium hexametaphosphate”)

Preservatives - all others listed in suitable optional ingredients shall bear the statement:

“____added as a preservative” (Example: “ascorbic acid added as a preservative”)

KEY POINTS TO TAKE AWAY

- To ensure that the resulting food product is safe and not able to support the growth of pathogens and/or their toxins, fruit ingredients and optional ingredients used by a CFO to make these products must be listed in 21 CFR 150
- The product is what it is supposed to be and is labeled accordingly, therefore not false and misleading the consumer.



THINGS YOU MAY WANT TO ASK:

- What resources are you using to determine your recipe and ingredients? Are you utilizing the 21 CFR 150?
- Are you making your product with allowable fruit and ingredients per the regulation?
- How are you measuring the components to ensure proper ratios of sugar to fruit to meet the standards?
- What kind of equipment do you have?

REFERENCES AND LINKS:

- “Manufacturing Jelly & Preserve Products”, J.E. Rushing, NC State University Cooperative Extension
- “Solids by Means of Refractometer—Official Final Action”, Official Methods of analysis of the Association of Official Analytical Chemists, 13th Ed. (1980), section 31.011
- Science & Technology of Making Preserves, Cornell University
- Fruit Jellies, Durward Smith, University of Nebraska
- 21 CFR 150
- 21 CFR 582.1 (GRAS)
- 21 CFR 101
- CPG Sec. 525.750 (Spices)
- 21 CFR 182.10 (Spices, seasonings, flavorings GRAS)
- American Spice Trade Association www.astaspice.org (spice list)



Jeanne-Marie Weathers, *REHS*
Retail Food Program Specialist
California Department of Public Health
Food and Drug Branch

Jeanne-Marie.Weathers@cdph.ca.gov

818-548-3075