



BAHAMAS NATIONAL STANDARD

PREPARATION OF FROZEN FRUIT PULPS AND PURÉES

FDBNS CRCP 6: 2010

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BBSQ Foreword

This draft national standard is identical to CARICOM Regional Organisation for Standards and Quality, CROSQ CRCP 6:2010. The national committee responsible for reviewing this standard is Technical Committee 15 Food and Food Products. The standard contains the requirements relevant for The Bahamas.

BBSQ Committee Representation

This Bahamas National Standard was adopted as a national standard under the supervision of the National Technical Committee for Food and Food Products (NTC 15) hosted by The Bahamas Bureau of Standards and Quality which at the time comprised of the following members:

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CARICOM REGIONAL CODE OF PRACTICE FOR PREPARATION OF FROZEN FRUIT PULPS AND PURÉES

CRCP 6: 2010

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ATTACHMENT PAGE FOR CRS AMENDMENT SHEETS

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Foreword

This CARICOM Regional Code of Practice was developed in an effort to provide acceptable guidelines for the preparation of frozen fruit pulps and purées manufactured and traded within the Caribbean Community. Fruit pulp is not usually intended for direct consumption.

This standard was approved by the Twenty-ninth Council for Trade and Economic Development (COTED) on 8-9 February 2010.

In the development of this Code of Practice, assistance was derived from the following:

- a) CODEX Alimentarius Commission, CAC/RCP 53: 2003, Code of Hygiene Practice for Fresh Fruits and Vegetables;
- b) CODEX Stan 79-1981, CODEX Standard for Jams (Fruit Preserves) and Jellies;
- c) CODEX Stan 1-1985 (Rev. 2-1999), CODEX General Standard for the Labelling of Pre-packaged Foods;
- d) CODEX Stan 192-1995, CODEX General Standard for Food Additives;
- e) SIC 2037 Frozen Fruits, Fruit Juices, Vegetables NAICS Code(S) 311411 (Frozen Fruit, Juice, and Vegetable Processing);
- f) ALINORM 70/25 September 1969, Report of the fifth session of the Joint ECE/CODEX Alimentarius Group of Experts on the Standardization of Quick Frozen Foods;
- g) ALINORM 07/30/12, May 2007, Report of the 30th Session of the CODEX Alimentarius Commission, GSFA Provisions for Food Category 04.1.2.8; GSFA Table 3 Provisions;
- h) Technopak Advisors Pvt. Ltd. January 2007 APEDA (Agriculture and Processed Food Products Exports Development Authority) "Taking Indian Food Products across the Globe - Frozen Fruits and Vegetables Report";
- i) Judy A. Harrison and Elizabeth Address; adapted for use in Florida by Amy Simonne, University of Florida, IFAS Extension, FCS 8767; August 2004, Preserving Food: Freezing Fruits;
- j) U.S. Department of Agriculture (USDA), A-A-20252A June 5, 2000 Superseding A-A-20252 April 7, 1997, Commercial Item Description Fruit Purees;
- k) Draft CARICOM Regional Standard, FDCS/CRS 27, Specification for Fruit and Vegetable Juices and Drinks, and Fruit Nectars;
- l) Draft CARICOM Regional Code of Practice, FDCS/CRCP 5, General Principles of Food Hygiene;
- m) Draft CARICOM Regional Standard, FDCS/CRS 5, Specification for Labelling of Pre-packaged Foods.

NOTE During the development of this standard, the CARICOM Regional Standard for Labelling of Pre-packaged Foods was still under development.

1 Scope

This Code of Practice gives guidelines for the preparation, processing and packaging of frozen fruit pulps and purées for use in the manufacture of fruit juices and nectars within the CARICOM region.

This Code of Practice is applicable to pulps and purées obtained from edible fruits. It describes the requirements for pulps and purées and the methods of analysis to be used.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CARICOM Regional Code of Practice for Food Hygiene

CARICOM Regional Code of Practice for Food Hygiene

CARICOM Regional Standard for the Labelling of Prepackaged Foods

CODEX Alimentarius Commission, CODEX Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997)

CODEX Alimentarius Commission, Code of Hygienic Practice for Quick Frozen Fruit and Vegetable Products

CODEX Alimentarius Commission, CODEX General Principles of Food Hygiene

FAO/WHO Expert Committee on Food Additives, Compendium of Food Additive Specifications

Official Methods of Analysis of the AOAC International Method 945.68

World Health Organization, Guidelines for Drinking Water Quality (Volumes 1 and 2)

3 Terms and definitions

For the purposes of this Code of Practice, the following terms and definitions shall apply.

3.1

Brix

percent of soluble solids content of a liquid as determined by a refractometer calibrated at 20 °C and read as 'degrees Brix' on the International Sucrose Scale

NOTE The reading is not corrected for acidity and corrected for temperature to the equivalent at 20 °C.

3.2

concentrated fruit purée

physical removal of water from fruit purée in an amount sufficient to increase the Brix level to a value at least 50 % greater than the Brix value established for reconstituted juice from the same fruit

3.3

critical control point

CCP

step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level

3.4

food additive

any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, that is added to food during preparation or storage and either becomes a part of the food or affects its characteristics for the purpose of achieving a particular technological purpose

NOTE The term does not include “contaminants” or substances added to food for maintaining or improving nutritional qualities.

3.5

fruit

edible usually sweet and fleshy mature ovary of a plant, which may or may not contain seeds and is deemed as suitable for processing

3.6

fruit pulp

unfermented pulpy product of the edible portion and flesh of sound, ripe fruit, mashed or cut into pieces but not reduced to a purée

3.7

fruit purée

unfermented but fermentable product obtained or extruded by sieving, grinding, screening or milling the edible part of the whole or peeled fruit without removing any juice

3.8

Hazard Analysis and Critical Control Point

HACCP

systematic approach to the identification, evaluation, and control of food safety hazards

3.9

ingredient

any substance, including a food additive, used in the manufacture or preparation of a food and present in the final product although possibly in a modified form

3.10

potable water

water fit for human consumption as established in the latest edition of the “Guidelines for Drinking Water Quality” of the World Health Organization (Volumes 1 and 2) or established by national legislation which shall take precedence

3.11

quick freezing process

point at which maximum ice crystallisation is achieved and product temperature has reached -18 °C or lower at the thermal centre

3.12

soluble solids

percentage by weight as determined by the refractometric method corrected to 20 °C using the international Sucrose Scale but making no correction for insoluble solids or acids

3.13

sound

produce not affected by rotting or deterioration which makes it unfit for consumption

4 General requirements

4.1 Fruit

4.1.1 The fruit used shall be sound, wholesome, ripe or appropriately mature, clean and safe.

4.1.2 Physical hazards such as animal or plant debris and other foreign material shall be removed by manual sorting and cleaning.

NOTE 1 Metal detectors may be used to assist in the removal of metal.

NOTE 2 Inspection of fruit may be considered a critical control point (CCP).

4.1.3 Fruit shall have a firm texture and its characteristic flavour.

4.1.4 Fruit shall be sorted to separate green and over-ripe ones. Fruits which have been damaged shall be washed, drained and stemmed with extra care. Such damaged fruits shall be cut, peeled and pits removed, if necessary.

EXAMPLE Damage includes bird-pecks and bruises

NOTE This process may be considered a CCP.

4.1.5 Fruit shall not be allowed to soak in wash water.

NOTE This is to prevent possible loss of nutrients and flavour, and entrance of microbes.

4.1.6 Unsound, unripe, inferior or damaged fruits and vegetables shall be removed and kept separate from those selected for processing. They shall be placed in an identified, appropriate waste disposal container.

4.2 Equipment

4.2.1 A colander, food press or strainer shall be used to make purées. Blenders and food processors may also be used to liquefy the fruit.

NOTE Maintenance or sanitation of the processing equipment may be a CCP.

4.2.2 Galvanized equipment shall not be used in direct contact with fruit.

NOTE Acid in the fruit may dissolve zinc from galvanized equipment which causes the product to become harmful.

4.2.3 Utensils used shall be made of stainless steel.

4.2.4 Iron utensils, copper or chipped enamelware shall not be used.

NOTE Metallic off-flavours can occur as a result of their use.

4.3 Packing

4.3.1 There shall be head space between the packed pulp or purée and the closure to allow for expansion during freezing.

4.3.2 The sealing edges of freezing containers shall be free of moisture and food particles before sealing or closing the freezer containers. The packaging shall be labelled as stated in 12.

NOTE See Annex A - Directions for preparing and freezing frozen fruit pulp and purées for some tropical fruit.

5 Quality criteria

5.1 Flavour and odour

5.1.1 Finished fruit pulp or purée product shall have a flavour and odour typical of the type of fruit from which it was derived.

5.1.2 Finished fruit pulp or purée shall have no foreign odours or flavours, such as stale, yeasty, burnt, musty, rancid or mouldy.

5.2 Colour

Finished fruit pulp or purée shall have a bright colour, free from oxidation that is typical of the fruit from which it was derived.

5.3 Consistency

5.3.1 Finished fruit pulp may consist of lumps and fibres.

5.3.2 Finished fruit purée shall be a homogeneous product that is pliable and any lumps present should be easily broken under gentle pressure. Lumps in the finished fruit purées shall not exceed 6.35 mm in diameter.

5.3.3 Finished fruit purées shall be easily spreadable. The single strength purée shall be fairly thick and reasonably smooth with a slight amount of free liquid at the edge of the mass.

5.4 Age requirement

Pulps or fruit purées shall be manufactured from the freshest fruit of the current crop.

5.5 Additives or preservatives

The use of additives in fruit purées shall be as specified in 7. Water may be added if required to standardize Brix levels to meet the specification level.

5.6 Shelf life

The minimum shelf life for the finished fruit pulps and purées shall be between 9 and 12 months.

5.7 Defects

5.7.1 Each type of fruit purée shall be free from pit fragments and shall be practically free from, but not limited to, stems and black, brown, green or other discoloured tissue that are uncharacteristic, and that are readily visible in a 454 g sample.

5.7.2 Each type of fruit purée shall not include more than one piece of stem or black, brown, green or other discoloured tissue that is over 4.75 mm in any dimension.

5.8 Foreign material

Fruit purées shall be clean, sound, wholesome, and free from evidence of foreign material such as dirt, silt, sand, thorns, insect parts, hair, wood, glass, and metal.

6 Additives

6.1 Use of additives

Additives may be added to the fruit to prevent darkening of the fruit and flavour loss.

NOTE The addition of sugar, sugar substitutes and or additives may be CCPs.

6.2 Approved food additives

Approved food additives shall conform to the specifications for identity and purity provided in the most recent revision of the compendium of Food Additive Specifications issued by the FAO/WHO Expert Committee on Food Additives.

6.3 Approved food grade additives

Only additives of food grade quality shall be used, including:

- a) ascorbic acid (Vitamin C) in either the powdered or tablet forms;

NOTE One-half teaspoon of powdered ascorbic acid is equivalent to 1500 mg.

- b) ascorbic acid mixtures, usually made of ascorbic acid mixed with sugar, or with sugar and citric acid;

- c) citric acid in the form of crystals; or

NOTE Three times more citric acid than ascorbic acid is needed to prevent discolouration.

- d) lemon juice.

NOTE 1 Six times more lemon juice than ascorbic acid is needed to prevent discolouration.

NOTE 2 Neither citric acid or lemon juice is as effective as ascorbic acid. When used in large quantities, they impart a tart flavour, often masking the natural fruit flavour.

NOTE 3 The maximum level of use individually or in combination for ascorbic acid or citric acid is 400 mg/kg.

6.4 Other permitted ingredients

6.4.1 Sugars with less than 2 % moisture as defined in the CODEX Standard for Sugars, CODEX STAN 212-1999, Amendment 1-2001 may be added to all products.

EXAMPLE Sucrose (white sugar or mill sugar), dextrose anhydrous, glucose, fructose

6.4.2 Non-nutritive sweeteners approved for use as stipulated in national regulations or the CODEX STAN 192-1995, CODEX General Standard for Food Additives (GSFA) where no national regulation exists, may be used.

NOTE Both saccharin and aspartame work well in frozen products. However, they do not give the added effect of colour protection as sugar does. If used, these must be declared on the labels.

7 Contaminants

7.1 Pesticide residues

Frozen fruit pulps and purées covered by the provisions of this Code of Practice shall comply with maximum residue limits (MRLs) for pesticides as established by the CODEX Alimentarius Commission for these products, where no National Regulations exist.

7.2 Other contaminants

Frozen fruit pulps and purées covered by the provisions of this Code of Practice shall comply with the maximum residue limits (MRLs) for contaminants as established by the CODEX Alimentarius Commission for these products, where no national regulations exist.

8 Freezing

8.1 General

The pulp or purée shall be frozen immediately after production and kept frozen at or below -18 °C.

NOTE Freezing temperature may be a CCP.

8.2 Quick freezing

8.2.1 Quick freezing shall be such that the temperature range of maximum crystallization is passed quickly.

8.2.2 The quick freezing process shall be complete when the product temperature has reached -18 °C at the thermal centre after thermal stabilization.

8.2.3 Fruit pulp and puree shall be maintained at a low temperature so that quality is maintained during transportation, storage, distribution and up to the time of use.

NOTE Maximum crystallization range occurs between -1 °C to -5 °C at the thermal centre of the product.

8.2.4 Freezing shall be done at -20 °C to -30 °C.

8.2.5 There shall be adequate space for air circulation between unfrozen food packages.

9 Storage

9.1 Frozen purée shall be kept for no more than 12 months for safety and best quality.

9.2 Cold storage should be designed and operated so as to maintain a product temperature of -18 °C or lower with a minimum of fluctuation.

NOTE The temperature of the cold storage may be a CCP.

9.3 Stock should be rotated to ensure that the products leave the cold storage on a First-In-First-Out (FIFO) basis.

10 Hygiene

10.1 A cleaning and sanitizing programme shall be in place. This programme shall be monitored to ensure that cleaning is appropriate and effective.

10.2 Cleaning procedures and methods shall include application of a detergent solution, rinsing with water and where appropriate, use of a sanitizing agent.

10.3 Products covered in this Code shall be prepared and handled in accordance with the appropriate sections of the most recent versions of the CARICOM Regional Code of Practice for Food Hygiene or the Recommended International Code of Practice – General Principles of Food Hygiene.

10.4 Products shall comply with microbiological criteria specified in the CODEX Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

NOTE Determination of microbiological criteria may be considered as critical control points (CCPs).

10.5 The CODEX Alimentarius Code of Hygienic Practice for Quick Frozen Fruit and Vegetable Products shall also apply.

11 Packaging

11.1 Packaging shall:

- a) protect the sensory (organoleptic) and other quality characteristics of the fruit;
- b) protect the product against moisture loss, dehydration and leakage;
- c) protect the food against microbial and other contamination, including contamination from the packaging material itself; and
- d) not add to the food any substance which may influence the quality of the food.

11.2 Containers shall be moisture-vapour resistant, durable, easy to seal and should not become brittle at low temperatures.

NOTE Containers suitable for freezing fruits include plastic freezer containers, flexible freezer bags or glass canning and freezing jars.

11.3 Retail containers shall be made of non-toxic materials that will not contaminate the product or affect its colour, aroma, flavour or consistency, and shall be designed to withstand stresses that may occur during packing, handling, transport and storage.

11.4 Only packaging materials that have been shown to resist deterioration or corrosion over a period of time exceeding the length of the shelf-life of the products, shall be used.

11.5 All retail containers shall be protected during transport by suitable shipping cartons or containers.

11.6 Where metal cans are used as retail containers, their internal surface shall be compatible with the product, and, if lacquered or coated, shall not release components of the lacquer or coating into the product during processing, packing, storage or transport.

NOTE Alternatively steel drums with ring closures, lined with two polyethylene bag, each individually closed with a security seal may be used.

11.6.1 Each drum shall have a label indicating the:

- a) name of the product;
- b) lot number;
- c) date of production;

d) expire date; and

e) net weight.

11.6.2 The exterior surface of the can shall be free from dents, rust, perforation and seam distortion.

11.6.3 The can shall bear no evidence of leaking, panelling or swelling.

12 Labelling

12.1 Labelling of containers of fruit pulps and purées shall comply with the most recent version of the CARICOM Regional Standard for the Labelling of Prepackaged Foods.

12.2 In addition the following specifications shall apply:

a) the name of the food as follows:

1) the name of the type of fruit used;

EXAMPLE Guava, banana, cherry

2) the style "Pulp" or "Purée";

3) the words "Frozen" or "Quick frozen" as applicable;

4) the words "sugar added" plainly and conspicuously accompanying the name of the product, if sugar has been added; and

NOTE Alternatively, the term "sweetened" may be used.

5) the name of the sweetener plainly and conspicuously seen as "contains x", where "x" represents the name of the artificial sweetener, if artificial sweeteners have been added;

b) complete list of ingredients in descending order of proportion and including additives, if any;

c) net contents declared by weight in either the metric system (Système Internationale (SI) units) or both metric and avoirdupois system of measurement as required by the country in which the food is sold;

d) name and address of the manufacturer, packer, distributor importer or exporter of the food;

e) country of origin of the product;

f) storage instructions, such as "Keep Frozen"; and

g) freezing temperature.

12.3 Retail packs and bulk packs shall also meet the following requirements:

a) there shall be an indication in the code of the best before or use by date, that is the date the product is fully marketable ; and

b) there shall be instructions for the storage and use of the product;

NOTE Information for utilization may also be included.

12.4 Fruit pulps and fruit purées shall be labelled “concentrated”, if the product is prepared by physically removing water from the fruit juice in an amount sufficient to increase the Brix level to a value at least 50 % greater than the Brix value established for reconstituted juice from the same fruit.

12.5 Where concentrated fruit purée is to be reconstituted before consumption as fruit juice, fruit purée, fruit nectar or mixed fruit juices or nectars or purées, the label shall bear appropriate directions for reconstitution on a v/v basis with water to the applicable Brix value in Annex C for reconstituted juice.

12.6 If the pulp is cooked, this shall be stated on the label.

12.7 Information for non-retail containers, not intended for sale to final consumers, shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, net contents and the name and address of the manufacturer, packer, distributor or importer, as well as storage instructions shall appear on the container.

NOTE For tankers, the information may appear exclusively in the accompanying documents.

13 Sampling and analysis

13.1 Sampling

13.1.1 Sampling procedures

When drawing and handling samples intended for testing, the sample, product, container for the sample and any sampling equipment shall be protected against contamination.

13.1.2 Composite sample

A portion of sample units shall be used to make a 454 g composite sample.

13.1.3 Preparation of sample

The product shall be prepared in accordance with the most recent edition of Official Methods of Analysis of the AOAC International Method 945.68.

13.1.4 Analytical requirements

13.1.4.1 Analytical testing

The analyses shall be made in accordance with the following methods from the Official Methods of Analysis of the AOAC International as specified in Table 1.

Table 1 — Analytical test methods for frozen fruit pulps and purees

Test	Method
Brix	932.12
Moisture	934.06
pH	981.12
Standard Plate Count	990.12 or 966.23
Yeast and Mold	997.02 ^a
<i>Coliform</i>	966.24
<i>E. coli</i>	966.24
^a Compendium of Methods for the Microbiological Examination of Foods, Third Edition, 1992, Section C-16, Paragraphs 16.4, 16.51, and 16.71	

NOTE Additional tests and test methods are outlined in Annex B.

13.1.4.2 Microbiological limits

Microbiological limits for all fruit purées shall comply with Table 2.

Table 2 — Microbiological limits

Microbiological parameter	Limit
Aerobic (Standard) plate count	< 50,000 per g in any sample
Yeast	< 5,000 Colony Forming Units (CFU) per g
Mold	< 5,000 CFU per g
<i>Coliform</i>	< 100 per g using the MPN (Most Probable Number) technique
<i>E. coli</i>	< 3 per g using the MPN technique

13.1.4.3 Moisture

Fruit purées shall have moisture content between 18 % $\pm$ 2 % and 30 % $\pm$ 2 %, except fig purée. Fig purée shall have a moisture content of 28 % $\pm$ 2 %.

13.1.4.4 pH and Brix

Minimum pH and Brix values for the purées of some of these fruit are shown in Table 3. In addition, Annex C also shows minimum Brix levels for reconstituted purées.

Table 3 — Minimum Brix and pH Levels

	Single Strength Purée Brix	Concentrate Brix	pH
Acerola (W.I. Cherry)	6.5 – 9.5	-	3.3 – 3.7
Banana	21.0 – 24.0	32.0 – 45.0	4.2 – 4.5
Guava	8 – 11	24.5 -25.5	3.0 – 4.2
Mango	14 - 16	28 – 29	3.7 – 4.4
Papaya	7 – 9.5	24 - 28	3.8 – 4.6
Passion Fruit	13.5 – 15.5	49.5 – 50.5	2.3 – 3.1
Soursop	12.5 – 15	-	3.3 – 3.8

13.1.5 Test results

13.1.5.1 Test results shall be reported as follows:

- Brix shall be reported to the nearest 0.1 °;
- moisture shall be reported to the nearest 0.1 %;
- pH shall be reported the nearest 0.1 value;
- standard plate count shall be reported to the nearest 100 per g;

- e) yeast and mold shall be reported to the nearest 50 per g; and
- f) *Coliform* and *E. coli* shall be reported to the nearest MPN.

13.1.5.2 Any result not conforming to the finished product requirements shall be cause for rejection of the lot.

14 Documentation and records

Records of processing, production and distribution shall be kept in the event of a recall. This period should be at least 6 months beyond the expiry date for the frozen product.

EXAMPLE Name and address of the fresh fruit supplier along with the date of receipt of produce; water quality; daily sanitization records; product processing records; daily freezer temperature and time records; distribution records; records of analysis

15 Recall procedures

Documented procedures shall be in place to enable rapid recall of any lot or batch of frozen food from a retail establishment. The recommendations of the relevant sections for the recall procedures of the CARICOM Regional Code of Practice for Food Hygiene and the CODEX General Principles of Food Hygiene (GPFH) shall apply.

16 Disposal of waste

16.1 Containers for waste shall be specifically identifiable and made of impervious material and stored away from the production area.

16.2 Storage areas for waste shall be kept clean.

16.3 Waste shall not be allowed to accumulate and must be disposed of through refuse collection on a regular basis.

17 Pest control

A Pest Control program shall be in place to ensure that the processing facility and its environs are kept clear of all harbourage sites for pests, including rodents, bugs, birds and other animals that could pose a potential threat to the food product manufactured and stored in the facility.

Annex A (informative)

Directions for preparing and freezing frozen fruit pulp and purées for some tropical fruit

A.1 Table A.1 provides directions for the preparation and freezing of some tropical fruits in the production of fruit pulps and purées.

Table A.1 — Directions for preparing and freezing fruit pulps and purées for some tropical fruits

Fruit	Preparation
Bananas	Select firm ripe bananas. Peel; mash thoroughly. Add ½ teaspoon (1500 mg) ascorbic acid per cup of mashed banana pulp. Package in moisture-vapour resistant container. Leave head space. Seal and freeze.
Gooseberries	Choose ripe berries. Sort; remove stems and blossom ends and wash. Press fruit through a sieve to make a purée. Package in moisture-vapour resistant container. Leave head space. Seal and freeze.
Guavas	Select ripe, tender fruit. Wash, peel and cut in half. Press through a sieve to purée and separate the seeds. Package in moisture-vapour resistant container. Leave head space. Seal and freeze.
Mangoes	Select firm, ripe mangoes that yield to gentle pressure. Wash, peel and slice. Press mango slices through a sieve, blender chop or chop in a food processor. Pack into containers with or without sugar. Leave head space. Seal and freeze.
Persimmons	Select orange-coloured, soft-ripe persimmons. Sort, wash, peel and cut into sections. Press fruit through a sieve to make a purée. For a better product, to each quart of purée add 1/8 teaspoon (375 mg) ascorbic acid. Purée made from native varieties needs no sugar. Purée made from cultivated varieties may be packed with or without sugar. Pack purée into containers. Alternatively, mix 1 cup sugar with each quart (1 kg) of purée and pack into containers. Leave head space. Seal and freeze.
Pomegranates	Select fully ripe pomegranates. Wash and cut in half. Place cut side down and rap the shell with a blunt instrument such as a hammer handle. This will break section walls and open juice sacs to form a pulp. Press fruit through a sieve to make a purée. Pack into containers with or without sugar. Leave head space. Seal and freeze.

Annex B **(normative)**

Processing

B.1 Fruit

B.1.1 Fruit pulps and purées shall be prepared in accordance with good manufacturing practices.

B.1.2 Fruit should be cut and peeled, cored, sliced or cut into sections and seeds removed if necessary.

NOTE This process may be considered a CCP.

B.2 Pulp

B.2.1 The sliced or cut fruit is extruded through a perforated plate or drum to result in the small particle sized pulp.

B.2.2 This pulp is immediately heated to a temperature above that of the inactivating temperature of the discolouring enzymes of the fruit.

NOTE Firmer fruit shall be cooked slowly; stirring frequently, until fruit is soft, resulting in a pulp.

B.3 Purée

B.3.1 The sliced or cut fruit is macerated by forcing through a perforated plate at ambient temperature to form a cold break.

B.3.2 The cold break shall be heated to a temperature which cooks the same into a purée. The purée is then finished to the desired texture and consistency.

B.3.3 The seeds, flesh and other fibrous matter of some fruits with many seeds, such as passion fruit and guavas, shall be passed through a fine screen to remove the stone cells and to obtain the purée.

B.3.4 The resultant semi-liquid may be concentrated to make a concentrated purée.

B.3.5 Concentrated fruit purée is obtained by the physical removal of water from the fruit purée in an amount sufficient to increase the Brix level to a value at least 50 % greater than the Brix value established for reconstituted juice from the same fruit.

Annex C (informative)

Methods of analysis endorsed

C.1 Methods of analytical testing endorsed are listed in Table C.1.

Table C.1 — Methods of analytical testing

Provision	Method	Principle	Type	Status
Ascorbic acid-L (additives)	IFU Method No 17a (1995)	HPLC	II	E
Ascorbic acid-L (additives)	ISO 6557-1: 1986	Fluorescence spectrometry	IV	E
Ascorbic acid-L (additives)	AOAC 967.21 IFU Method No 17 ISO 6557-2: 1984	Indophenol method	III	E
Citric acid (additives)	AOAC 986.13	HPLC	II	E
Citric acid (additives)	EN 1137: 1994 IFU Method No 22 (1985)	Enzymatic determination	III	E
Glucose, fructose, sorbitol	EN 12630 IFU Method No 67 (1996) NMKL 148 (1993)	HPLC		TE
pH-value	EN 1132 (1994) IFU Method No 11 (1968/1989) ISO 1842:1991	Potentiometry		TE
Saccharin	NMKL 122 (1997)	Liquid chromatography	II	E
Soluble solids	AOAC 983.17 EN 12143 (1996) IFU Method No 8 (1991) ISO 2173: 2003	Indirect by refractometry	I	E
Sucrose (permitted ingredients)	EN 12146 (1996) IFU Method No 56 (1985/1998)	Enzymatic determination	III	E
Sucrose (permitted ingredients)	EN 12630 IFU Method No 67 (1996) NMKL 148 (1993)	HPLC	II	E
Total solids	AOAC 985.26	Microwave oven drying		TE

Annex D (informative)

Minimum Brix level for reconstituted juice and reconstituted purée and minimum juice and or purée content for fruit nectars (% v/v) at 20 °C

D.1 Table D.1 provides the Brix level for reconstituted fruit juices and purees, as well as the minimum juice and or puree content (% v/v) for fruit nectars.

NOTE For the purposes of the Standard the Brix is defined as the soluble solids content of the juice as determined by the method found in the Section on Methods of Analysis and Sampling.

Table D.1 — Minimum Brix level for reconstituted fruit juices and purees and minimum juice and or puree content (% v/v) for fruit nectars

Botanical name	Fruit's common name (other local names may be added)	Minimum Brix level for reconstituted fruit juices and reconstituted purée	Minimum juice and or purée content (% v/v) for fruit nectars
<i>Actinidia deliciosa</i> (A. Chev.) C. F. Liang & A. R. Ferguson	Kiwi	(*) ^a	(*) ^a
<i>Anacardium occidentale</i> L.	Cashewapple	11.5	25.0
<i>Ananas comosus</i> (L.) Merrill <i>Ananas sativus</i> L. Schult. f.	Pineapple	12.8 ^{e,f}	40.0
<i>Annona muricata</i> L.	Soursop	14.5	25.0
<i>Annona squamosa</i> L.	Sugar Apple	14.5	25.0
<i>Averrhoa carambola</i> L.	Starfruit	7.5	25.0
<i>Carica papaya</i> L.	Papaya	(*) ^a	25.0
<i>Chrysophyllum cainito</i>	Star Apple	(*) ^a	(*) ^a
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai var. <i>Lanatus</i>	Water Melon	8.0	40.0
<i>Citrus aurantifolia</i> (Christm.) (swingle)	Lime	8.0 ^e	50.0
<i>Citrus aurantium</i> L.	Sour Orange	(*) ^a	50.0
<i>Citrus limon</i> (L.) Burm. f. <i>Citrus limonum</i> Rissa	Lemon	8.0 ^e	50.0
<i>Citrus paradisi</i> Macfad	Grapefruit	10.0 ^b	50.0
<i>Citrus paradisi</i> , <i>Citrus grandis</i>	Sweetie grapefruit	10.0	50.0
<i>Citrus reticulata</i> Blanca	Mandarine/Tangerine	11.8 ^e	50.0
<i>Citrus sinensis</i> (L.)	Orange	11.8 – 11.2 ^e consistent with the application of national legislation of the importing country but not lower than 11.2 ^d	50.0
<i>Cocos nucifera</i> L. ^c	Coconut	5.0	25.0
<i>Cucumis melo</i> L.	Melon	8.0	35.0
<i>Cucumis melo</i> L. subsp. <i>melo</i> var. <i>inodorus</i> H. Jacq	Honeydew Melon	10.0	25.0

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Botanical name	Fruit's common name (other local names may be added)	Minimum Brix level for reconstituted fruit juices and reconstituted purée	Minimum juice and or purée content (% v/v) for fruit nectars
<i>Cucumis melo</i> L. subsp. <i>melon</i> var. <i>inodorus</i> H. Jacq.	Casaba Melon	7.5	25.0
<i>Cydonia oblonga</i> Mill.	Quince	11.2	25.0
<i>Diospyros khaki</i> Thunb.	Persimmon	(*) ^a	40.0
<i>Empetrum nigrum</i> L.	Crowberry	6.0	25.0
<i>Eriobotrya japonica</i>	Loquat	(*) ^a	(*) ^a
<i>Eugenia syriaca</i>	Guavaberry Birchberry	(*) ^a	(*) ^a
<i>Eugenia uniflora</i> Rich.	Suriname Cherry	6.0	25.0
<i>Ficus carica</i> L.	Fig	18.0	25.0
<i>Fortunella</i> Swingle sp.	Kumquat	(*) ^a	(*) ^a
<i>Fragaria x. ananassa</i> Duchesne(<i>Fragaria chiloensis</i> Duchesne x <i>Fragaria virginiana</i> Duchesne)	Strawberry	7.5	40.0
<i>Genipa americana</i>	Genipap	17.0	25.0
<i>Hippophae elaeagnaceae</i>	Sea Buckthorn	(*) ^a	25.0
<i>Hippophae rhamnoides</i> L.	Buckthornberry or Sallow-thornberry	6.0	25.0
<i>Litchi chinensis</i> Sonn.	Lychee	11.2	20.0
<i>Lycopersicon esculentum</i> L.	Tomato	5.0	50.0
<i>Malpighia</i> sp. (Moc. & Sesse)	Acerola (West Indian Cherry)	6.5	25.0
<i>Malus domestica</i> Borkh.	Apple	11.5 ^f	50.0
<i>Malus prunifolia</i> (Willd.) Borkh. <i>Malus sylvestris</i> Mill.	Crab Apple	15.4	25.0
<i>Mammea americana</i>	Mammee Apple	(*) ^a	(*) ^a
<i>Mangifera indica</i> L.	Mango	13.5	25.0
<i>Morus</i> sp.	Mulberry	(*) ^a	30.0
<i>Musa</i> species including <i>M. acuminata</i> and <i>M. paradisiaca</i> but excluding other plantains	Banana	(*) ^a	25.0
<i>Passiflora edulis</i>	Yellow Passion Fruit	(*) ^a	(*) ^a
<i>Passiflora edulis</i> Sims. f. <i>edulis</i> <i>Passiflora edulis</i> Sims. f. <i>Flavicarpa</i> O. Def.	Passionfruit	12 ^e	25.0
<i>Passiflora quadrangularis</i>	Passion Fruit	(*) ^a	(*) ^a
<i>Phoenix dactylifera</i> L.	Date	18.5	25.0
<i>Pouteria sapota</i>	Sapote	(*) ^a	(*) ^a
<i>Prunus armeniaca</i> L.	Apricot	11.5	40.0
<i>Prunus avium</i> L.	Sweet Cherry	20.0	25.0

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Botanical name	Fruit's common name (other local names may be added)	Minimum Brix level for reconstituted fruit juices and reconstituted purée	Minimum juice and or purée content (% v/v) for fruit nectars
<i>Prunus domestica</i> L. subsp. <i>domestica</i>	Plum	12.0	50.0
<i>Prunus domestica</i> L. subsp. <i>domestica</i>	Quetsche	12.0	25.0
<i>Prunus persica</i> (L.) Batsch var. <i>nucipersica</i> (Suckow) c. K. Schneid.	Nectarine	10.5	40.0
<i>Prunus persica</i> (L.) Batsch var. <i>persica</i>	Peach	10.5	40.0
<i>Prunus spinosa</i> .	Sloe	6.0	25.0
<i>Psidium guajava</i> L.	Guava	8.5	25.0
<i>Punica granatum</i> L.	Pomegranate	12.0	25.0
<i>Pyrus arbustifolia</i> (L.) Pers.	Aronia/Chokeberry	(*) ^a	(*) ^a
<i>Pyrus communis</i> L.	Pear	12.0	40.0
<i>Ribes nigrum</i> L.	Black Currant	11.0	30.0
<i>Ribes rubrum</i> L.	Red Currant	10.0	30.0
<i>Ribes rubrum</i> L.	White Currant	10.0	30.0
<i>Ribes uva-crispa</i>	Red Gooseberry	(*) ^a	30.0
<i>Ribes uva-crispa</i> L.	Gooseberry	7.5	30.0
<i>Ribes uva-crispa</i> L.	White Goosberry	(*) ^a	30.0
<i>Rosa canina</i> L.	Cynorrhodon	(*) ^a	40.0
<i>Rosa</i> sp. L.	Rosehip	9.0	40.0
<i>Rubus chamaemorus</i> L.	Cloudberry	9.0	30.0
<i>Rubus chamaemorus</i> L. <i>Morus hybrid</i>	Mulberry	(*) ^a	40.0
<i>Rubus fruticosus</i> L.	Blackberry	9.0	30.0
<i>Rubus hispidus</i> (of North America) <i>R. caesius</i> (of Europe)	Dewberry	10.0	25.0
<i>Rubus idaeus</i> L. <i>Rubus strigosus</i> Michx.	Red Raspberry	8.0	40.0
<i>Rubus loganobaccus</i> L. H. Bailey	Loganberry	10.5	25.0
<i>Rubus occidentalis</i> L.	Black Raspberry	11.1	25.0
<i>Rubus ursinus</i> Cham. & Schldl.	Boysenberry	10.0	25.0
<i>Rubus vitifolius</i> x <i>Rubus idaeus</i> <i>Rubus baileyanus</i>	Youngberry	10.0	25.0
	Other: High acidity		Adequate content to reach a minimum acidity of 0.5
	Other: High pulp content, or Strong flavour		25.0
	Other: Low acidity, Low pulp content, or Low/medium flavour		50.0
<i>Sambucus nigra</i> L. <i>Sambucus canadensis</i> .	Elderberry	10.5	50.0
<i>Solanum quitoense</i> Lam.	Lulo	(*) ^a	(*) ^a
<i>Sorbus aucuparia</i> L.	Rowanberry	11.0	30.0
<i>Sorbus domestica</i>	Sorb	(*) ^a	30.0

Botanical name	Fruit's common name (other local names may be added)	Minimum Brix level for reconstituted fruit juices and reconstituted purée	Minimum juice and or purée content (% v/v) for fruit nectars
<i>Spondia lutea</i> L.	Cajá	10.0	25.0
<i>Spondias tuberosa</i> Arruda ex Kost.	Umbu	9.0	25.0
<i>Syzygiun jambosa</i>	Pome Apple	(*) ^a	(*) ^a
<i>Tamarindus indica</i>	Tamarind (Indian date)	13.0	Adequate content to reach a minimum acidity of 0.5
<i>Theobroma cacao</i> L.	Cocoa pulp	14.0	50.0
<i>Theobroma grandiflorum</i> L.	Cupuaçu	9.0	35.0
<i>Vaccinium macrocarpon</i> Aiton <i>Vaccinium oxycoccos</i> L.	Cranberry	7.5	30.0
<i>Vaccinium myrtillus</i> L. <i>Vaccinium corymbosum</i> L. <i>Vaccinium angustifolium</i>	Bilberry/Blueberry	10.0	40.0
<i>Vaccinium vitis-idaea</i> L.	Lingonberry	10.0	25.0
<i>Vitis Vinifera</i> L. or hybrids thereof <i>Vitis Labrusca</i> or hybrids thereof	Grape	16.0	50.0

^a No data currently available. The minimum Brix level of the reconstituted juice shall be the Brix level as expressed from the fruit used to make the concentrate.

^b Acid corrected as determined by the method for total titratable acids in the Section on Methods of Analysis

^c This product is 'coconut water' which is directly extracted from the coconut without expressing the coconut meat.

^d It is recognized that in different geographical areas, the Brix level may naturally differ from this range of values. In cases where the Brix level is consistently lower than this range of values, reconstituted juice of lower Brix from this origin introduced into international trade will be acceptable, provided it meets the authenticity methodology listed in the General Standard for Fruit Juices and Nectars and the level will not be below 10 ° Brix.

^e It is recognized that in different geographical areas, the Brix level may naturally differ from this value. In cases where the Brix level is consistently lower than this value, reconstituted juice of lower Brix from this origin introduced into international trade will be acceptable, provided it meets the authenticity methodology listed in the General Standard for Fruit Juices and Nectars and the level will not be below 10 °Brix for pineapple juice and apple juice.

NOTE 1 For the purposes of the standard the Brix is defined as the soluble solids content of the juice as determined by the method found in the Section on Methods of Analysis and Sampling.

NOTE 2 If a juice is manufactured from a fruit not mentioned in the above list, it must, nevertheless, comply with all the provisions of the standard, except that the minimum Brix level of the reconstituted juice shall be the Brix level as expressed from the fruit used to make the concentrate.

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