

PHILIPPINE NATIONAL STANDARD

PNS/BFAD 02:2005
ICS 67.080

Ethnic food products – Sweet preserves



BUREAU OF PRODUCT STANDARDS

Foreword

The Bureau of Food and Drugs (BFAD), as mandated by RA 3720, to establish and formulate standards on food products, entered into a Memorandum of Agreement with the Industrial Technology Development Institute (ITDI) in 1994 to develop selected ethnic food product standards.

Thus, the Food Standards Technical Committee (FSTC) was formed by ITDI to establish standards for selected ethnic food products that will assure food safety, harmonize with International Food Control laws, rules and regulations, and ensure better access to domestic and export market. FSTC is composed of representatives from the food industry particularly processors of the commodity under standardization, the academe, research and development institutes, concerned government agencies including BFAD and industry associations.

The BFAD Philippine National Standards (PNS) Committee was created under the Bureau Personnel Order (BPO) No. 9-D s. 2005 dated 13 January 2005 and as amended by BPO No. 63-A s. 2005 dated 09 May 2005, to fast track the finalization of Ethnic Food Products Standards and other priority food product standards endorsed to BFAD.

With the initiatives and efforts by the BFAD PNS Committee, Administrative Order (AO) No. 2005-0018 entitled "Philippine National Standard on Ethnic Food Products" was signed by Secretary Francisco T. Duque, III, MD, MSC of the Department of Health on 30 June 2005 and published last 10 August 2005 in Manila Times and Manila Standard Today. This Administrative Order covers the standards for (1) Dry Base Mixes for Soups and Sauces and (2) Sweet Preserves.

I. SCOPE

These standards shall apply to the following SWEET PRESERVES in syrup and which has been heat processed in hermetically sealed containers to achieve commercial sterility; provided that other sweet preserves not covered by these standards shall be governed by existing standards for food in general.

1. Sugar Palm Fruit (*Arenga pinnata*), or “Kaong”
2. Jackfruit (*Artocarpus heterophyllus* Lan Syn. *A. integrifolia*), or “Langka”
3. Banana (*Musa* sp. *Saba* or *cardaba*)
4. Legumes, specifically, chickpeas (*Cicer arietinum*), red beans (*Phaseolus aureus*) and white kidney beans (*Phaseolus vulgaris*)
5. Coconut (*Cocos nucifera*)
6. Mixed Preserves (*halo-halo*)

The term SWEET PRESERVES shall refer to the above products stated in this Order including Nata de coco in syrup, which is covered by Philippine National Standards (PNS) No. 1219-1994 (see Annex B).

II. DEFINITION OF TERMS

For the purpose of this standard, the following terms shall mean:

Acidified low-acid food is any food that has been treated so as to attain an equilibrium pH of 4.6 or lower after processing.

Ambient temperature refers to the immediate surrounding area for a specified time such as a hot month or cold month.

Brix is the concentration of sugar in syrup corresponding approximately to percentage as measured with a refractometer or hydrometer and expressed in °Brix units.

Commercial sterility of thermally processed food is the condition achieved by application of heat, alone or in combination with other appropriate treatment, sufficient to render the food free from microorganisms capable of growing in food at ambient conditions at which the food is likely to be held during distribution and storage.

Equilibrium pH is the pH of the blended or homogenized heat processed food product.

Food is any substance, whether processed or semi-processed or raw which is intended for human consumption and including beverages, chewing gum and any substance, which has been used as an ingredient on the manufacture, preparation or treatment of “food.”

Food additive is any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacturing, processing, preparation, treatment, packaging, transport or holding of such food results or maybe reasonably expected to result (directly or indirectly) in its or its by-product becoming a component of (or otherwise affecting the characteristic of) such food.

Food standard is a regulatory guideline that defines the identity of a given food product (i.e. its name and the ingredients used for its preparation) and specifies the minimum quality factors and, when necessary, the required fill of container. It may also include specific labeling requirements other than or in addition to the labeling requirements generally applicable to all prepackaged foods.

Good manufacturing practices (GMP) a quality assurance system aimed at ensuring that products are consistently manufactured, packed, repacked or held to a quality appropriate for the intended use. It is thus concerned with both manufacturing and quality control procedures.

Hazard analysis and critical control points (HACCP) is a preventive food quality management system, which identifies, evaluates and controls the hazards significant to food safety specific to a product.

Heat processed food is any food processed by heat to an extent, which results in a product that is safe and will not spoil under normally expected temperature of non-refrigerated storage and transportation.

Hermetically sealed containers are containers, which are sealed to protect the contents against the entry of microorganisms during and after heat processing.

Ingredient is any substance including food additive used as a component in the manufacture or preparation of a food and present in the final product in its original or modified form.

Label includes any tag, brand, mark, pictorial, or other descriptive matter, written printed, marked, embossed or impressed on, or attached to a container of food.

Labeling means any written, printed or graphic matter (1) upon any article or any of its container or wrappers or (2) accompanying the packaged food.

Legumes are all the recognized dried legumes suitable in making preserves, like chickpeas (garbanzos), red beans and white kidney beans.

Lot is food produced during a period of time and under more or less the same manufacturing condition indicated by a specific code.

Low-acid food is any food, other than alcoholic beverages, with pH above 4.6 and a water activity (a_w) greater than 0.85.

Mixed preserves are the combination of five fruits and/or legumes processed into sweet preserves.

Packaging the process of packing that is part of the production cycle applied to a bulk product to obtain the finished product. Any material, including painted material, employed in the packaging of a product including any outer packaging used for transportation or shipment. Packaging materials are referred to as primary or secondary according to whether or not they are intended to be in direct contact with the product.

Pasteurization is the heating of food at 100°C or below at a specified time.

pH is the intensity or degree of acidity of a food material.

Processing the part of production cycle starting from weighing of raw materials to the obtaining of a bulk product.

Refractometer is the instrument used to measure the percent soluble solids, referred to as degree Brix (°Brix), in concentration of sugars expressed in terms of number of grains of sucrose per 100g of liquid.

Room temperature refers to the temperature range of 28° –30°C, Philippine condition (Zone IV).

Scheduled process is the thermal process chosen by the processor for a given product and container size to achieve at least commercial sterility.

Sterilization temperature is the temperature maintained through the thermal process as specified in the scheduled process.

Sterilization time is the time between the moment the sterilization temperature is achieved and the moment the cooling started.

Sweet preserves are food products prepared from fruits, legumes, coconut, or “nata,” singly or in combination thereof, packed in syrup and heat processed in hermetically sealed containers to achieve commercial sterility.

Thermal process is the heat treatment to achieve commercial sterility and is quantified in terms of time and temperature.

Water activity (a_w) is the ratio of water vapor pressure of the substance to the vapor pressure of pure water at the same temperature.

III. STANDARDS FOR SWEET PRESERVES

A. DESCRIPTION

1. Product definition

Each of the following sweet preserves shall be packed in syrup, with or without additives, heat processed in hermetically sealed containers to prevent spoilage and specifically described as:

- 1.1 Sugar Palm in syrup – prepared from whole or cut (halves or quarters), sound, cleaned, washed seeds of sugar palm fruit (*kaong*);
- 1.2 Jackfruit in syrup – prepared from ripe, peeled, trimmed, seedless, cleaned and washed whole or sliced jackfruit bulb (*langka*);
- 1.3 Banana in syrup – prepared from rare ripe (80% yellow and 20% green peel color), sound, clean and peeled fruit of *saba* banana variety;
- 1.4 Legumes in syrup – prepared from all the recognized varieties of chickpeas or *garbanzos*, red beans and white kidney beans;
- 1.5 Coconut in syrup – prepared from meat of *macapuno* or *buko* or a combination of these as defined in B.1.1.2 (a) and B.1.1.2 (b) which has been cut into thin strips, or chopped and formed into balls;
- 1.6 Mixed preserves in syrup – prepared from mixture of pre-cooked basic ingredients, with or without the optional ingredients, as specified in Section B.1.2.

2. Product classification

- 2.1 Low-acid SWEET PRESERVES in syrup – the product with an equilibrium pH > 4.6 and water activity (a_w) > 0.85
- 2.2 Acidified SWEET PRESERVES in syrup – the product with an equilibrium pH = 4.6 and water activity (a_w) > 0.85. This product has a raw or natural pH > 4.6 and acid/s is/are added to bring down the final equilibrium product pH to = 4.6.
- 2.3 Water activity controlled low acid SWEET PRESERVES in syrup – the product with an equilibrium pH of >4.6 and a water activity (a_w) range of >0.85 to = 0.90.
- 2.4 Water activity controlled SWEET PRESERVES in syrup – the product with an equilibrium water activity = 0.85 regardless of pH value.

3. Process description

- 3.1 Sterilization of low acid products at 115°-121°C (240°-250°F) for a specified length of time adequate to prevent the growth of pathogenic microorganisms, i.e., *Clostridium botulinum* and other heat resistant microorganisms capable of growing in food packed in hermetically sealed containers and stored and distributed under normal non-refrigerated conditions.

- 3.2 Pasteurization of acidified and water activity controlled low acid products at 100°C (212°F) or lower for a specified length of time adequate to prevent growth of pathogenic and spoilage microorganisms capable of growing in food packed in hermetically sealed containers and stored and distributed under normal non-refrigerated conditions.

4. Product styles for banana and coconut

4.1. Banana

- 4.1.1 Whole – consists of whole peeled banana, which may not be of uniform size.
- 4.1.2 Sliced – consists of peeled banana cut into halves/ wedges/ cubes and mixture thereof.
- 4.1.3 Combination – consists of mixture of whole and sliced peeled banana.

4.2. Coconut

- 4.2.1 Coconut Strings in syrup are products made of thinly sliced meat of macapuno and/or buko, singly or in combination, of uniform thickness and packed in syrup.
- 4.2.2 Coconut balls in syrup are products made of comminuted meat of macapuno and/or buko, singly or in combination, formed into balls of uniform size and packed in syrup.

B. ESSENTIAL COMPOSITION AND QUALITY FACTORS

1. Composition

1.1 Basic Ingredients

1.1.1 For Sugar Palm, Jackfruit, Banana, and Legumes:

- a. As defined in sections A.1, numbers 1, 2, 3, and 4, respectively.
- b. Sugar shall be one or more of the carbohydrate sweeteners such as sucrose, invert sugar, glucose and fructose.

1.1.2 For Coconut:

- a. Coconut sport (*macapuno*) shall be 10-11 months from pollination (matured coconut), clean and free from surface defects, cracks and mold growth. The “eyes” should be intact, and the meat should be firm, white to creamy white in color, and free from undesirable odor and taste.

- b. Young coconut (*buko*) shall be 7-8 months from pollination, clean and free from surface defects, cracks and mold growth. The “eyes” should be intact, and the meat should be firm, white to creamy white in color, and free from undesirable odor and taste.
- c. Sugar shall be one or more of the carbohydrate sweeteners such as sucrose, invert sugar, glucose and fructose.

1.2 Kinds and Styles of Ingredients for Halo-halo:

The product shall consist of each of the five ingredients listed under Basic Ingredients to which maybe added any one or more of the ingredients listed under Optional Ingredients.

1.2.1 Basic ingredients

- a. *Nata* – Cubed or diced, produced by bacterial fermentation of suitable substrate under sanitary conditions.
- b. Red mung beans – Prepared from seeds of any of the recognized varieties of *Phaseolus aureus*.
- c. White kidney beans – Prepared from seeds of any of the recognized varieties of *Phaseolus vulgaris*.
- d. *Kaong* – Prepared from whole or cut (halves or quarters), sound, cleaned and washed seeds of sugar palm fruit (*Arenga pinnata*).
- e. *Langka* – Prepared from ripe, peeled, trimmed, seedless, cleaned and washed whole or sliced jackfruit (*Artocarpus heterophyllus* Lan. Syn. *A. integrifolia*) bulb.

1.2.2 Optional Ingredients (but not limited to)

- a. Coconut - Prepared from meat of coconut sport (*macapuno*) or young coconut (*buko*) or a combination of these varieties of *Cocos nucifera*, which has been cut into thin strips.
- b. Banana – Prepared from ripe (80% yellow and 20% green peel color), sound, cleaned and peeled fruit of *saba* banana (*Musa* sp. cultivar *saba* or *cardaba*) variety, whole, sliced or combination.
- c. *Ube/ubi* – Prepared from sound, cleaned and peeled tubers of any of the recognized purple yam variety (*Dioscorea* spp.), cooked to appropriate consistency.
- d. *Garbanzos* – Prepared from seeds of any of the recognized varieties of chickpeas (*Cicer arietinum*).

1.2.3 Proportion of Ingredients

The product shall contain *nata*, fruits and legumes in the following proportions, based on the individual drained weights in relation to the total drained weight of all fruits as specified in the following:

<u>Basic Ingredients</u> (minimum)	90%
<i>Nata</i>	20% (minimum)
Red mung beans	20% (minimum)
White kidney beans	10% (minimum)
<i>Kaong</i>	10% (minimum)
<i>Langka</i>	3% (minimum)
<u>Optional Ingredients</u> (Total)	10%

1.3 Strength of Packing Syrup

1.3.1 For Sugar Palm, Jackfruit, Banana, Legume and Halo-Halo:

The packing syrup prepared from one or more of the carbohydrate sweeteners such as sucrose, invert sugar, glucose and fructose, shall be classified on the basis of total soluble solids (°Brix) of the finished product after equilibrium:

- a. Extra light syrup – not less than 10° to below 14°Brix
- b. Light syrup – 14° to below 18°Brix
- c. Heavy – 18° to below 22°Brix
- d. Extra heavy syrup - 22° and above

1.3.2 For Coconut

The packing syrup prepared from one or more of the sugars identified in B.1.1 (b), with or without the addition of fruit stock or juice, shall have total soluble solids (°Brix) of 22 and above.

1.4 Compliance with packing syrup classification

The cut-out strength of packing syrup shall be determined on sample average, but no container shall have a °Brix value lower than the specified syrup strength.

2. Quality Criteria

2.1 General Requirements

- 2.1.1 For Sugar Palm – The end product shall be reasonably firm in texture. The color shall be characteristic of the raw material.

- 2.1.2 For Jackfruit – The end product shall be firm and substantially intact, light to golden yellow in color, and free from undesirable flavor and odor.
- 2.1.3 For Banana – The end product shall be reasonably firm in texture and free from shriveled, soft, flabby or hardened pulp. Flavor and color shall be characteristic of the variety and free from objectionable flavor and odor.
- 2.1.4 For Legumes – The end product shall be reasonably soft in texture and free from hardened pulp. Flavor and color shall be characteristic of the variety and free from objectionable flavor and odor.
- 2.1.5 For Coconut
 - a. Coconut strings, packed in syrup shall be firm and free from excessively hard pieces, of relatively uniform sizes. The color and flavor shall be characteristic of the raw materials used.
 - b. Coconut balls, packed in syrup shall be soft and chewy, of relatively uniform sizes. The color and flavor shall be characteristic of the raw materials used.

2.2 Quality Requirements for Halo–halo

The end product shall be reasonably soft in texture and free from hardened *nata*, fruit and legume pulp. Flavor and color shall be characteristic of the individual ingredients and free from undesirable flavor and odor.

2.3 Types of Defects and Tolerances

- 2.3.1 For Sugar Palm: Certain common defects shall not be present in amounts greater than the following limitations:
 - a. Broken: sugar palm seeds less than a quarter ($\frac{1}{4}$) of the seed
Maximum limit – 8% of the drained weight
 - b. Presence of embryo: embryo adhering to the seed flesh or is found loose in the pack
Maximum limit – 8% of the drained weight
 - c. Blemished: surface discoloration, spots and bruises that contrast the overall color of sugar palm seeds but do not penetrate into the flesh
Maximum limit – 8% of the drained weight
 - d. Tough pieces: sugar palm seeds with excessively firm texture.
Maximum limit – 10% of the drained weight
 - e. Deformed pieces
Maximum limit – 10% of the drained weight
 - f. Total of the foregoing defects a, b, c, d, e
Maximum limit – 10% of the drained weight

2.3.2 For Jackfruit: Certain common defects shall not be present in amounts greater than the following limitations:

- a. Blemished: any surface discoloration and spots
Maximum limit:
500 g pack or less - not more than 3 blemished bulbs
More than 500 g pack - not more than 10% by weight
- b. Extraneous matters: peels of seeds and fiber strands that adhere to the fruit or are found loose in the pack
Maximum limit:
500 g pack or less - not more than 2 pieces
More than 500 g pack - not more than 4 pieces

2.3.3 For Banana: Certain common defects shall not be present in amounts greater than the following limitations:

- a. Mechanical: excessive trimmings including serious cuts on the surface of the units
Maximum limit – not more than 2 cuts per whole fruit
- b. Presence of fiber strands: fiber strand adhering to the flesh
Maximum limit:
500 g pack or less - not more than 2 fiber strands
More than 500 g pack - not more than 4 fiber strands
- c. Presence of seeds: visible seeds adhering to the pulp or are found loose in the pack
Maximum limit:
500 g pack or less - not more than 2 pieces
More than 500 g pack - not more than 4 pieces
- d. Blemished: surface discoloration, spots and bruises that contrast the overall color of banana but do not penetrate into the flesh
Maximum limit:
500 g pack or less - not more than 1 blemished fruit
More than 500 g pack - not more than 2 blemished fruits

2.3.4 For Legumes in syrup, product shall be reasonably free from defects and shall not exceed the limit set herein for the respective defects specified in Table 1.

Table 1. Defects and Tolerances for Legumes in Syrup

Defects	Description	Chickpeas in Syrup	Red <i>mung</i> beans in Syrup	White kidney beans in Syrup
Broken	Consisting of portions of beans or peas; separated or individual cotyledons*; broken cotyledons; and loose skins but not including entire intact beans or peas with skins attached	10% of drained weight	10% of drained weight	10% of drained weight
Blemished	Consisting of beans or peas which are slightly stained, discolored or spotted	5% of drained weight	5% of drained weight	5% of drained weight
Infested	Beans or peas showing signs of insect-infested and/or insect-damaged by storage insects	1% of drained weight	1% of drained weight	1% of drained weight
Loose skin	Visible outer covering of beans or peas that are found loose in the pack	1% of drained weight	0.5% of drained weight	0.5% of drained weight
Extraneous plant material	Consisting of any vine or leaf or pod material from the bean of pea plant, or other harmless plant material not purposely added as an ingredient	0.5% of drained weight	0.5% of drained weight	0.5% of drained weight
Total of any combination of the above defects shall not exceed		12% of drained weight	12% of drained weight	12% Of drained weight

*Not applicable for chickpeas

2.3.5 For Coconut in syrup, product shall be reasonably free from defects and shall not exceed the limit set herein for the respective defects:

<u>Defects</u>	<u>Limit</u>
(a) Parings (consisting of coconut strings of balls with attached parings)	1% by weight
(b) Extraneous coconut fruit parts (consisting of plant material over 5 mm in length and pieces aggregating to an area of 2.5mm ² or larger)	2

2.4 Classification of “Defectives”

A container that fails to meet the applicable requirements specified in sub-sections B.2.3.1 to B.2.3.5, shall be considered as defective.

2.5 Lot acceptance

For Sugar Palm, Jackfruit, Banana, Legumes and Coconut, a lot will be considered as meeting the applicable quality requirements when the number of “defectives”, as defined in sub-section B.2.3, does not exceed the acceptance number (c) of the appropriate sampling plan ($AQL=6.5$) (CAC/RM 42-1969).

C. FOOD ADDITIVES

Food additives when used shall be in accordance with the regulations of the Bureau of Food and Drugs, and may include the following in Table 2:

D. METAL CONTAMINANTS

For Sugar Palm, Jackfruit, Banana, Legumes Coconut and Halo–Halo:

- | | |
|---------|---|
| 1. Lead | 0.1 mg/kg ¹ (max., calculated as Pb) |
| 2. Tin | 250 mg/kg (max., calculated as Sn)
for products packed in cans |

E. HYGIENE

For Sugar Palm, Jackfruit, Banana, Legumes Coconut and Halo–Halo:

1. It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene {CAC/RCP 1-1969, Rev. 2 (1985)}, and processed according to the Recommended Code of Practice for the Processing and Handling of Sweet Preserves.
2. To the extent possible in Good Manufacturing Practice, the product shall be free from objectionable matter.²
3. When tested by appropriate methods of sampling and examination, the product:²
 - 3.1 shall be free from microorganisms in numbers, parasites which may represent a hazard to health;
 - 3.2 shall not contain any substance originating from microorganisms in amounts, which may represent a hazard to health.

¹ Temporarily endorsed

² Codex Alimentarius, Volume 5A-1994

Table 2. Food Additives for Sweet Preserves

FOOD ADDITIVES	MAXIMUM ALLOWABLE LEVEL	KAONG	JACK-FRUIT	BANANA	LEGUMES	COCONUT	HALO-HALO
1. Acidulant a. Citric acid b. Fumaric acid c. Lactic acid d. Malic acid	GMP	/	/	/	/	/	/
2. Anti-microbial agents a. Sodium metabisulfite b. Potassium Metabisulfite	350 ppm Codex	/	/	/	/	/	/
3. Anti-oxidant Ascorbic acid	GMP	/	/	/	/	/	/
4. Flavoring substances Any permissible flavoring agents as specified by BFAD	GMP	/	NA	/	NA	NA	/
5. Food color Any permissible coloring agents as specified by BFAD	GMP	/	NA	NA	NA	NA	/
6. Firming Agents a. Calcium chloride b. Calcium gluconate	GMP	NA	/	/	NA	NA	NA
7. pH Control agents a. Sodium carbonate b. Sodium citrate c. Sodium hydroxide	GMP	NA	NA	NA	/	NA	/
8. Stabilizers and thickeners a. Sodium Carboxymethyl Cellulose b. Modified starch	GMP	NA	NA	NA	NA	/	NA
9. Others	All others not included in the above list shall be allowed as carry over, provided they are approved by the BFAD Regulation and shall be in accordance to Section 5.2 of the "Principles Relating to the Carry-Over of Food Additives into Foods" CCAC/Vol. 1, 1991	NA	NA	NA	NA	NA	/

LEGEND:
 / - Applicable
 NA - Not Applicable

F. WEIGHTS AND MEASURES

Fill of Container shall be described as such:

1. Minimum fill

For Sugar Palm, Jackfruit, Banana, Legumes Coconut and Halo–Halo:

The container shall be filled with ingredients and packing medium, and shall occupy not less than 90% of the water capacity of the container. The water capacity of the container is the volume of distilled water at 20°C, which the sealed container will hold when completely filled. A container that fails to meet the requirement for minimum fill (90% of the container capacity) shall be considered “slack filled.”

2. Lot acceptance

For Sugar Palm, Jackfruit, Banana, Legumes, Coconut and Halo–Halo:

A lot will be considered as meeting the requirement of sub-section F.1 (Minimum Fill) when the number of “slack filled” containers does not exceed the acceptance number (c) of the appropriate sampling plan.

3. Minimum drained weight

3.1 For Sugar Palm, Jackfruit, Banana, Legumes and Halo–Halo:

The drained weight of the product shall not be less than 60% of the declared net weight.

3.2 For Coconut:

The drained weight of the product shall not be less than 75% of the declared net weight.

G. LABELING

1. Each container shall be labeled and marked with the following information:

1.1 The name of the product shall be labeled as such and that the scientific name of the raw material may also be declared. The packing medium shall be declared as: “Extra light syrup” or “Light syrup” or “Heavy syrup” or “Extra heavy syrup” as may be appropriate.

1.1.1 “Sugar Palm in ____Syrup” or “*Kaong* in Syrup,” or other common names in accordance with the country in which the product is distributed.

1.1.2 “Jackfruit in ____Syrup” or “*Langka* in ____Syrup,” or other common names in accordance with the country in which the product is distributed.

- 1.1.3 “Banana in _____Syrup” or “Saba in _____Syrup,” or other common names in accordance with the country in which the product is distributed.
 - 1.1.4 The name of the specific legumes followed by the words “in _____Syrup” or other common names in accordance with the country in which the product is distributed.
 - 1.1.5 “Coconut in _____Syrup” or other common names, such as “*Macapuno* in _____Syrup” or “*Buko* in _____Syrup.”
 - 1.1.6 “Mixed Preserves in _____Syrup” or “*Halo-halo* in _____Syrup” or other common names in accordance with the country in which the product is distributed.
- 1.2 Name and address of the manufacturer and/or distributor of the food.
 - 1.3 List of ingredients and food additives in descending order of proportion. Sulfites when present at 10 mg/kg or more shall be declared. Ascorbic acid, if added to preserve color, shall be declared in the list of ingredients as “ascorbic acid added as an antioxidant or ascorbic added to retain color”.
 - 1.4 The net content by weight in metric system. Other systems of measurement required by importing countries shall appear in parenthesis after the metric system unit.
 - 1.5 Lot or code number.
 - 1.6 The words “Product of the Philippines,” if intended for export
 - 1.7 The country of origin, if imported.
 - 1.8 Open date marking
The words “Best before” followed by the month and year indicating end of period at which the product shall retain its optimum quality attributes at defined storage conditions.
2. Optional Provision

The declaration of energy and nutrients on the label shall contain the following information expressed per serving size of ¼ cup (68 g):

- 2.1 The amount of energy, expressed in kilocalories;
- 2.2 The amounts of total fat, protein, total carbohydrates such as dietary fiber and sugars, expressed in grams;
- 2.3 In addition to any nutritional information required, the total quantity in the final product of each vitamin and mineral added, expressed in %RDA per serving.

H. METHODS OF ANALYSIS AND SAMPLING

1. pH

According to AOAC (2004), pH of Acidified Foods using Commercial Apparatus.

2. Water activity (a_w)

According to AOAC (2004), Water Activity of Canned Vegetables using Commercial a_w Meter.

3. Examination of Canned Foods

According to USFDA Bacteriological Analytical Manual (2001), Examination of Canned Foods.

4. Total Soluble Solids

According to AOAC (2004), Solids in Syrups by Hand-held Refractometer.

5. Sulfurous Acid

According to AOAC (2004), Sulfurous Acid (Total) in Food by Modified Monier-Williams Method.

6. Lead

According to AOAC (2004), Lead in Food by Atomic Absorption Spectrophotometric Method.

7. Tin

According to AOAC (2004), Tin in Canned Foods by Atomic Absorption Spectrophotometric Method.

8. Drained Weight

According to AOAC (2004).

9. Method of Sampling

Sampling shall be in accordance with the FAO/WHO Alimentarius Sampling Plans for Prepackaged Foods (AQL = 6.5) (Ref. CAC/RM 42-1969). (see Annex A)

**I. RECOMMENDED INTERNATIONAL CODE OF PRACTICE –
GENERAL PRINCIPLES OF FOOD HYGIENE**

This Code recommends general hygienic practices for use in the handling (including growing and harvesting, preparation, processing, packaging, storage, transport, distribution and sale) of food for human consumption in order to ensure a safe, sound and wholesome product.

The general hygienic practices shall be in accordance with Codex Alimentarius Volume 1B, 1995, Section 1: Food Hygiene.

J. RECOMMENDED CODE OF PRACTICE FOR THE PROCESSING AND HANDLING OF SWEET PRESERVES

This Code of Practice is concerned with the receipt of raw materials and ingredients, preparation and heat processing of sweet preserves as defined in this Code, in order to maintain their quality up to the time of final sale. The products may be prepared from fruits, legumes, and gel-like mass (nata) produced by bacterial fermentation in suitable substrates.

The practice for the processing and handling of sweet preserves shall be in accordance with:

1. FAO, UN-WHO. 1995. General Requirements (Food Hygiene). Codex Alimentarius Volume IB; and
2. The Food Processors Institute. 1988. Canned Foods: Principles of Thermal Process Control, Acidification and Container Closure Evaluation. Washington, D.C.

ANNEX A

**FAO/WHO ALIMENTARIUS SAMPLING PLANS FOR PREPACKAGED FOODS
(AQL = 6.5)
CAC/RM 42-1969**

Sampling Plan 1
Normal Operations
(Inspection Level 1, AQL = 6.5)

A. Net weight is equal to or less than 1 kg (2.2 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
4,800 or less	6	1
4,801 – 24,000	13	2
24,001 – 48,000	21	3
48,001 – 84,000	29	4
94,001 – 144,000	48	6
144,001 – 240,000	84	9
More than 240,000	126	13

B. Net weight is greater than 1 kg (2.2. lb) but not greater than 4.5 kg (10 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
2,400 or less	6	1
2,401 – 15,000	13	2
15,001 – 24,000	21	3
24,001 – 42,000	29	4
42,001 – 72,000	48	6
72,001 – 120,000	84	9
More than 120,000	126	12

C. Net weight is greater than 4.5 kg (10 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
600 or less	1	1
601 – 2,000	13	2
2,001 – 7,200	21	3
7,201 – 15,000	29	4
15,001 – 24,000	48	6
24,001 – 42,000	84	9
More than 42,000	126	13

Sampling Plan 2
In Case of Disputes
(Inspection Level 2, AQL = 6.5)

A. Net weight is equal to or less than 1 kg (2.2 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
4,800 or less	13	2
4,801 – 24,000	21	3
24,001 – 48,000	29	4
48,001 – 84,000	48	6
94,001 – 144,000	84	9
144,001 – 240,000	126	13
More than 240,000	200	19

B. Net weight is greater than 1 kg (2.2. lb) but not greater than 4.5 kg (10 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
2,400 or less	13	2
2,401 – 15,000	21	3
15,001 – 24,000	29	4
24,001 – 42,000	48	6
42,001 – 72,000	84	9
72,001 – 120,000	126	13
More than 120,000	200	19

C. Net weight is greater than 4.5 kg (10 lb)

Lot Size (N)	Sample size	Acceptance Number (C)
600 or less	13	2
601 – 2,000	21	3
2,001 – 7,200	29	4
7,201 – 15,000	48	6
15,001 – 24,000	84	9
24,001 – 42,000	126	13
More than 42,000	200	19

Source: FAO/WHO Codex Alimentarius Commission Sampling Plans for Pre-Packaged Foods (AQL=6.5) (CAC/RM42 – 1969)

ANNEX B

PHILIPPINE NATIONAL STANDARD
PNS 1219:1994
Nata de Coco in Syrup – Specification

1. Scope

This standard specifies requirements and methods of test for *nata de coco* in syrup packed in hermetically-sealed container.

2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3. Definitions

For the purpose of this standard, the following definitions shall apply:

- 3.1 raw nata de coco – Thick, white, translucent and gel-like mass produced by the bacteria, *Acetobacter pasteurianus* (*Acetobacter aceti* subsp. *Xylinum*), during fermentation of coconut substrate.
- 3.2 equilibrium pH – The pH of the thoroughly comminuted contents of the product container. This represents the pH of the product at equilibrium (taken not less than 7 days from date of production) or after the exchange of acids between the various components of the product has stabilized (see Annex A).
- 3.3 total soluble solids (TSS) – The measure of sugar and other soluble solids expressed in degree Brix (°Bx).
- 3.4 translucent – Partially transparent, having the property to allow light to pass through.
- 3.5 off-odor – Fermented, rancid and other unacceptable odor.
- 3.6 off-color – Any discoloration not characteristic of the product.
- 3.7 texture – Firmness of nata both raw and processed measured by using a penetrometer or its equivalent.
- 3.8 drained weight – The mass of solid food in a container.
- 3.9 filth and extraneous matter – Any objectionable matter contributed by animals such as rodent, insect or bird or any visible matter not inherent to the product.

4. Classification

- 4.1 nata de coco in syrup – The product consisting of uniformly cut pieces of nata de coco packed in syrup with or without food additives, i.e. acidulants, preservatives, food colors or flavors.
- 4.2 acidified nata de coco in syrup – The heat-processed product with an equilibrium pH of < 4.6 and packed in hermetically sealed container.

5. Requirements

5.1 Syrup strength (expressed in TSS)

- 5.1.1 Extra light syrup – not less than 10°Bx: 10° to below 14°Bx
- 5.1.2 Light syrup – not less than 14°Bx: 14° to below 18°Bx
- 5.1.3 Heavy syrup – not less than 18°Bx: 18° to below 22°Bx
- 5.1.4 Extra heavy syrup – not less than 22°Bx: 22°Bx and above

NOTE – Cut- out strength of syrup is to be determined on sample average, but no container shall have a total soluble solids (TSS) value of ? 1°Brix of the specified syrup strength.

5.2 Food additives – Food additives when used shall be in accordance with the regulations of the Bureau of Food and Drugs.

5.2.1 Acidulants Allowable Level (MAL)

Citric Acid	GMP
Ascorbic Acid	GMP
Fumaric Acid	GMP
Lactic Acid	GMP
Malic Acid	GMP

5.2.2 Preservatives (for acidified products only)

	ADI x 40	
Sorbates, mg/kg, max.	25 x 40	1000
Benzoate, mg/kg, max.	5 x 40	200

NOTE – Combined level shall not exceed 1000 mg/kg (Test methods in Annexes B and C).

- 5.2.3 Sulfites, (SO₂), mg/kg, max. 0.7 x 40 28
(Annex D)
- 5.2.4 Food Color as specified in BFAD regulations
- 5.2.5 Flavors GMP

5.3 Physical

5.3.1 Nata de coco shall have a translucent and smooth appearance. It shall have no acetic acid odor and other off-odor and color. Texture shall be firm with a penetrometer reading of ≥ 7.0 mm (see Annex E).

5.3.2 The minimum fill shall not be less than 90% of the water capacity of the container. The minimum weight of the product shall not be less than 6-% of the actual net weight (see Annex F). Each container should have uniform-sized nata de coco pieces.

5.4 Microbiological

Molds, yeast and bacteria if present shall conform to the microbiological requirements as shown in Table 1 when tested in accordance with the specified test methods.

Table 1 – Microbiological Limits

Test	Limit	Test Method
<u>For acidified nata de coco</u>		
Aerobic Plate Count, cfu/g, max	100	According to the USFDA Bacteriological Analytical Manual (1995, 8 th Edition) using the Pour Plate Method
Molds and Yeast, cfu/g, max	10	
<u>For low acid nata de coco</u>		
Commercial sterility test	pass	According to USFDA Bacteriological Analytical Manual (1995, 8 th Edition), Examination of Canned Foods.

5.5 Hygiene

5.5.1 *Nata de coco* in syrup shall be prepared under hygienic conditions in accordance with PNS 96.

5.5.2 Process Requirement – *Nata de coco* in syrup shall be heat-processed for adequate length of time after packing into bottles, cans or retortable pouches, to prevent spoilage when held at ambient temperature. Low acid nata de coco shall be processed at the appropriate process schedule to attain commercial sterility.

5.5.3 To the extent possible in GMP, the product shall be free from objectionable matter. The presence of unavoidable filth and extraneous matter shall be as specified in Table 2.

Table 2 – Tolerance for Visible Filth and Extraneous Matters

Type of Visible Filth and Extraneous Matters		Cooked Nata de Coco Limit in Sample
	<1 kg	1 kg to 4 kg
Hair, whole insects, recognizable insect parts, feather fragments	Absent	Absent
Extraneous materials > 1.00mm	Absent	Absent
Extraneous materials > 1.00mm (e.g. coconut husk fibers, wood particles)	Not more than 2 pieces	Not more than 5 pieces
Other extraneous materials or other dirt particles >0.5mm	Not more than 10% w/w of the drained nata de coco pieces <u>and/or</u> Not more than 10 particles per 500 mL of medium	Not more than 10% w/w of the drained nata de coco pieces <u>and/or</u> Not more than 10 particles per 500 mL of medium
Textile fibers	Not more than 5 pieces	Not more than 10 pieces

6. Sampling

6.1 Lot – A lot shall consist of products manufactured in one production shift, under similar processing condition.

6.2 Samples shall be taken in accordance with PNS 466/ISO 2859.

7. Packaging

Nata de coco shall be packed in hermetically-sealed containers suitable for food contact use.

8. Marking and Labelling

Each container shall be labelled and marked with the following information:

8.1 The name “Nata de coco in Syrup”

8.2 Name and address of manufacturer

8.3 List of ingredients and food additives in descending order of proportion. Sulfites when present at 10 ppm or more shall be declared.

- 8.4 Net mass in metric units
- 8.5 Lot or code number
- 8.6 Date of manufacture/Best before date
- 8.7 The words “Product of the Philippines”

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