PHILIPPINE NATIONAL STANDARD

PNS/BFAD 17:2007
ICS 67.080

Recommended code of practice for the processing and handling of dried tropical fruits

BUREAU OF PRODUCT STANDARDS

Contents **Page**

Foreword

The Philippine National Standards for Dried Mango Products, Dried Tropical Fruits and Recommended Code of Practice for the Processing and Handling of Dried Tropical Fruits are another product standards being developed by the Technical Working Group still under the project entitled "Development of Standards for Selected Ethnic Food Products".

The committee composed of representatives from the food industry, particularly processors of the commodity under standardization, the academe, research and development institutions, concerned government agencies and industry associations worked together in the development of the standard.

Posting of the draft standards was made to solicit comments and suggestions from different stakeholders. Public consultation workshops were conducted not only in Metro Manila but also in Cebu where the products were originated. Attendees composed of representatives from different stakeholders actively participated and gave their comments during the discussion.

The final drafts were forwarded to the Bureau of Agriculture and Fisheries Product Standards, Department of Agriculture (BAFPS-DA) for notification by the World Trade Organization Secretariat.

The final copy was submitted to the Bureau of Product Standards - Department of Trade and Industry (BPS-DTI) for adoption.

These standards were developed not only to serve as guide for the assurance of safety and quality but also to make the products more competitive in the local and world market.

Recommended code of practice for the processing and handling of dried tropical fruits

1 Scope

This Code of Practice applies to dried tropical fruits such as mango, papaya, pineapple and jackfruit products that have been dried by natural or artificial means or a combination of both.

This code is concerned with the receipt of raw materials and ingredients, preparation and processing of other dried tropical fruit products as defined in this Code, in order to conform to the required standards stated in PNS/BFAD No.15:2007 Standards for Dried Mango Products and PNS/BFAD No. 16:2007 Standards for Dried Tropical Fruits.

The mango (*Mangifera* spp.), papaya *(Carica* spp.), pineapple (*Ananas* spp.) and jackfruit (*Artocarpus* spp.), covered by this Code is dried to the extent that the greater part of the moisture has been removed, and in addition the fruit may be subjected to a safe and appropriate treatment in preparation and packing, to permit marketing in normal trade channels.

Dried tropical fruit products covered by this Code include, but are not limited to: dried mango, papaya, pineapple and jackfruit in slices, cubes, dices, chunks, chips, strips, bulbs and other styles according to the list of acceptable varieties established by the Authority of the consuming country.

Excluded in this Code are dried tropical fruit products dried exclusively by spray drying.

2 Definition of terms

For the purpose of this Code, the following definitions apply:

2.1
container
it is any form of packaging material, which completely or partially encloses the food (including wrappers). A container may enclose the food as a single item or several units or types of prepackaged food when such is presented for sale to the consumer

2.2
current good manufacturing practices (cGMP)
a quality assurance system aimed at ensuring that products are consistently manufactured, packed or repacked or held to a quality appropriate for the intended use. It is thus concerned with both manufacturing and quality control procedures

2.3
drying
it is the removal of water by natural means, i.e., by sun-drying

2.4
dehydration
it is the removal of moisture by artificial means and in some cases in combination with sun-drying sufficient to ensure quality and shelf life stability at ambient conditions

2.5
food
it is any substance, whether processed, semi-processed or raw, which is intended for human consumption, and includes drink, chewing gum and any substance which has been used in the manufacture, preparation or treatment of "food" but does not include cosmetics or tobacco or substances used only as drugs

2.6
food additives
any substance the intended use of which results or may reasonably be expected to result, directly or indirectly, in its becoming a component or otherwise affecting the characteristics of any food (including any substance intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding food; and including any source of radiation intended for any such use), if such substance is not generally recognized, among experts qualified by scientific training and experience to evaluate its safety, as having been adequately shown through scientific procedures to be safe under the conditions of the intended use (R.A.3720, Food, Drug and Cosmetic Act)

2.7
food standard
it 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 the container. It may also include specific labeling requirements other than or in addition to the labeling requirements generally applicable to all prepackaged foods

2.8
ingredient
it 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

2.9
label
it includes any tag, brand, mark, pictorial, or other descriptive script, written, printed, marked, embossed or impressed on, or attached to the container

2.10
labeling
it is any written, printed or graphic matter (1) upon any article or any of its container or wrappers and/or (2) accompanying the packaged food

2.11
lot
it is a food produced during a period of time and under more or less the same manufacturing condition indicated by a specific code.

2.12
moisture content
it is the percentage weight of water in relation to the dry weight of the product

2.13
packaging
it is 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 of 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

2.14
sweetening agent
it is one or more of the sugars, honey, high intensity sweeteners and artificial sweeteners

2.15
water activity
it is the ratio of vapor pressure of water in the product to the water vapor pressure of pure water at the same temperature. It is also a measure of water available for the growth of microorganisms

3 Raw materials, ingredients and packaging material requirements

3.1 Raw materials and ingredients

Raw materials for processing shall not contain parasites, microorganisms, toxins, and decomposed or extraneous substances.

3.1.1 Tropical fruit (mango, papaya, pineapple, jackfruit)

Fruit variety to be used for processing shall be prepared from sound, clean, mature fruit and is of a quality fit to be sold fresh for human consumption.

3.1.2 Sweetening agent

Sweetening agent or agents to be used shall conform to food standards required by the Bureau of Food and Drugs (BFAD), the Codex Alimentarius Commission and/or authority for these products.

3.1.3 Food additives

All additives shall conform to the food standards required by the BFAD and/or authority.

3.1.4 Water

Only clean, potable water (Annex A) shall be used for the preparation and for all the pretreatment and processing steps of beverage production. Non-potable water may be used only for operations not in direct contact with the food materials provided that this does not pose a hazard to health as determined and approved by the official agency having the jurisdiction over it.

3.2 Packaging materials

The packaging materials should be appropriate for the product to be packed and for the expected conditions of handling during distribution and storage. These should provide the products adequate protection from contamination and should be sufficiently durable to withstand mechanical, chemical and thermal stresses encountered during processing and normal distribution. All packaging materials must be clean and free from defects that may affect the product or package integrity. These shall be stored in a clean and sanitary manner.

4 Hygiene

It is recommended that the product covered by the provisions of this code of practice 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 4 (2003)) and/or the BFAD A.O. No. 153 s. 2004 - Guidelines, Current Good Manufacturing Practices in Manufacturing, Packing, Repacking or Holding Food, covering the plant facilities and operations requirement including the construction and layout of processing plant, hygienic facilities, equipment, utensils and working surfaces.

5 Preparation and processing

The preparation of dried tropical fruit products is described separately from the receipt of raw materials until the packing operations.

5.1 Preparation of raw materials

5.1.1 Tropical fruit (mango, papaya, pineapple, jackfruit)

5.1.1.1 Receipt of raw materials

Fruit shall only be accepted if it is sound and suitable for processing. Those that show signs of deterioration or damage specified in PNS/BAFPS 13:2004 for mango, PNS/ BAFPS 33:2005 for papaya, PNS/BAFPS 09:2004 for pineapple shall not be used.

5.1.1.2 Inspection and sorting

The tropical fruit shall be inspected and sorted according to quality before processing (PNS/BAFPS 13:2004, PNS/BAFPS 33:2005 and PNS/BAFPS 09:2004). Sorting may be carried out on moving inspection belts or sorting tables.

5.1.1.3 Washing and/or sanitizing

Fruit is washed to remove dust, dirt, insect, mold spores, plant parts and filth that might contaminate or affect the color, aroma or flavor of the fruit. Washing with water must be accompanied with brushing, rubbing and forcing the water against the fruit and into crevices. Sanitizing agents may be used in the wash or rinse water.

5.1.1.4 Peeling and slicing or pureeing

The tropical fruit is peeled and sliced or pureed according to desired product form.

5.1.1.5 Addition of sugar

Sugar and other sweetening agents may be added to prepared tropical fruit. Depending on the method used, the fruit may be drained prior to drying.

5.1.1.6 Addition of other ingredients

Food additives and other components for the preparation of the intended dried products are added to the prepared tropical fruit.

5.1.1.7 Drying

Peeled and sliced or pureed tropical fruit, sweetened or unsweetened, is subjected to drying according to desired product form.

5.1.1.8 Other treatments

Other treatments may be done to the prepared tropical fruit pertaining to drying and adequate processing of the product.

5.1.1.9 Cooling

The dried tropical fruit products are cooled, sorted and graded.

5.2 Packing

Packing can be done either mechanically or manually. It is important to standardize filling for economic reasons. Gas packing or vacuum packing may be done.

5. 3 Closing or sealing of containers

Seams and other closures shall be sealed air-tight to meet the requirements of the processors.

The pouch seal area must be free of food material and wrinkles. Sealing temperature and pressure shall conform to the sealing equipment to be used.

5.4 Coding of sealed containers

Coding of sealed container shall be indelible with details of production date and time, batch code, product code, the product line in which product is packed, the manufacturing plant and other information necessary for product traceability. Where the container does not permit the code to be embossed or inked, the label shall be legibly perforated or otherwise marked, and securely affixed to the product container.

5.5 Post-process container handling

Pouches shall be handled singly rather than in bunches, and care must be exercised so as to prevent damage by roughened contact surfaces.

6 Food additives

6.1 Food additives when used shall be in accordance with the regulations established by the Bureau of Food and Drugs (BFAD) (B.C. No.2006:016:

(Updated List of Food Additives), the Codex Alimentarius Commission and/or authority for these products.

The following food additives listed in, but not limited to, Table 1, may be used for the manufacture of dried tropical fruit products.

Table 1 – Food additives used for processing dried tropical fruit products

Food additive	Maximum level
Acidifying agent Any permissible acidifying agents as specified by BFAD	GMP
Antioxidants Ascorbic acid Sodium erythorbate	GMP
Humectants Any permissible humectants agents as specified by BFAD	GMP
Sulphites	3,000 mg/kg

6.2 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 "Principle Relating to the Carry-Over of Food Additives into Foods" (CAC/Vol. 1 1991).

7 Labeling

7.1 Each container shall be labeled and marked with the following information in accordance with BFAD's Labeling Regulation:

(a) The name of the product shall be "Dried Mango", "Dried Papaya", "Dried Pineapple" or "Dried Jackfruit". It shall have additional descriptor as to forms and styles or grading.
(b) Products using artificial sweetener/s shall have statement/s referring to its low and/or reduced caloric value and the possibility of hypersensitivity to some of its components.
(c) The complete list of ingredients and food additives used in the preparation of the product in descending order of proportion.
(d) The net quantity of content by weight in the metric system. Other systems of measurement required by importing countries shall appear in parenthesis after the metric system unit.
(e) The name and address of the manufacturer, packer and/or distributor of the food.
(f) Open date marking

The words "Best/"Consume Before" indicating end of period at which the product shall retain its optimum quality attributes at defined storage conditions.

(g) Lot or code number identifying product lot.

(h) The words "Product of the Philippines" or the country of origin if imported.
(i) Additional requirements

A pictorial representation of fruit(s) on the label should not mislead the consumer with respect to the fruit so illustrated.

7.2 Nutrition labeling

Nutrition labeling shall conform to established regulations of BFAD.

8 Quality assurance

8.1 Inspection of finished products

All processed products shall be inspected before labelling and casing and defective products shall be withdrawn or rejected. The company must have an approved policy and procedures based on the BFAD A.O. No. 153 s. 2004 – Guidelines, Current Good Manufacturing Practices in Manufacturing, Packing, Repacking or Holding Food.

8.2 Record keeping

Permanent and legible dated records of time, temperature code mark and other pertinent details shall be kept concerning each load. Such records are essential as a check on processing operations.

Written records of all container closure examinations shall specify the code lot, the date and time of container closure inspections, the measurements obtained and all the corrective actions taken.

Records shall be maintained identifying initial distribution of the finished product to facilitate, if necessary, the segregation of specific food lots that may have been contaminated or otherwise unfit for intended use.

All process deviations involving failure to satisfy the minimum requirements of the process shall be recorded detailing those deviations and the actions taken.

8.3 Hazard analysis and critical control points (HACCP)

HACCP plan must be developed for each product. Prior to the development of HACCP plan, establishments shall have developed, documented and implemented prerequisite programs based on BFAD's Current Good Manufacturing Practices (cGMP) and Hygiene Control.

Guidelines for the Application of the Hazard Analysis Critical Control Point (HACCP) System (CAC/GL 18-1993) present the recommended sequence and document formats for the application of the HACCP systems.

9 Storage and transport of finished product

Storage and transport conditions of the finished product shall be such that the integrity of the product container, and the safety and quality of the product are not adversely affected.

Cases and cartons must be thoroughly dry. They must be of proper size so that the containers fit snugly and are not subject to damage from movement within the case. They must be strong enough to withstand normal transport.

Extreme temperature fluctuations during storage and transport of the product must be avoided to prevent product deterioration.

10 Laboratory control procedures

Each food processing establishment shall have access to laboratory control of both the processes used and the finished products. All food ingredients and food products declared unfit for human consumption by the laboratory shall be rejected.

Representative samples for each lot or batch shall be taken to assess the safety and quality of the product.

Microbiological laboratory shall be separated from the processing area. No pathogens shall be handled within the premises of manufacturing plant.

Laboratory procedures for quality control of the processes and the product must follow recognized or standard methods for easy interpretation of results.

11 End product specifications

Appropriate methods shall be used for sampling analysis and determinations to meet the following specifications:

1. To the extent possible in good manufacturing practices, the products shall be free from any objectionable characteristics.
2. The product shall not contain any toxic substances originating from microorganisms and chemicals.
3. The product shall be free from chemical pollutants in amounts which may represent hazard to health.
4. The product shall comply with the requirements set forth by the Bureau of Food and Drugs and the Codex Alimentarius Commission on Pesticide Residues and Food Additives.

Annex A

Standard parameters and values for drinking water (Sec.2 Philippine National Standards for Drinking Water. Department of Health, Manila.)

Table A.1 – Standard values for bacteriological quality

Source and mode of supply	Bacteria	Standard value (no./100mL)
a. All drinking water supplies under all circumstances (Level I, II, III bottled water and emergency water supplies)	*E.coli* or thermotolerant (fecal) coliform bacteria	0
b. Treated water entering the distribution system	*E.coli* or thermotolerant (fecal) coliform bacteria	0
c. Treated water in the distribution system	*E.coli* or thermotolerant (fecal) coliform bacteria	0
	Total coliforms	Must not be detectable in any 100mL sample. In any case of large quantities where sufficient samples are examined, it must not be present in 95% of samples taken throughout any 12-month period.

Table A.2 – Standard values for physical and chemical quality: aesthetic quality

Constituent maximum or characteristics	Level (mgL)
Taste	Unobjectionable
Odor	Unobjectionable
Color	5 TCU
Turbidity	5 NTU
Aluminum	0.2
Chloride	250
Copper	1
Hardness	300 (as $CaCO_3$)
Hydrogen sulfide	0.05
Iron	1
Manganese	0.5
pH	6.5 – 8.5
Sodium	200
Sulfate	250
Total dissolved solids	500
Zinc	5

The following normative documents contain provisions that, through reference in this text, constitute provisions of this standard. For undated references, the latest edition of the referenced document (including amendments) applies.

A.O. No. 153 s. 2004. **Guidelines, Current Good Manufacturing Practice in Manufacturing, Packing, Repacking or Holding Food**. Bureau of Food and Drugs. Department of Health. Alabang, Muntinlupa City, Philippines.

Association of Analytical Chemists. **Official Methods of Analysis Manual**. 16th ed., 1995. AOAC International. 481 North Frederick Ave., Suite 500, Gaithersburg, MD 20877-2417. U.S.A.

B.C. No.016 s. 2006. **Updated List of Food Additives.** Bureau of Food and Drugs. Department of Health. Alabang, Muntinlupa City, Philippines.

FAO/WHO Codex Alimentarius Commission Manual. 1995. Codex Alimentarius Commission. Food and Agriculture Organization. Viale delle Terme di Caracalla, 00100 Rome, Italy.

Food, definition. ALINORM 04/27/41, para. 88 and Appendix VI. 2005. Codex Alimentarius Commission. Food and Agriculture Organization. Viale delle Terme di Caracalla, 00100 Rome, Italy.

Philippine National Standard No. 991:1993. **Agricultural and Other Food Products – Bottled Drinking Water Specifications**. Bureau of Product Standards. Department of Trade and Industry. Makati City, Philippines.

PNS/BAFPS 33:2005. **Fresh Fruits – Papaya-Grading and classification**. Bureau of Agriculture and Fisheries Product Standards. Department of Agriculture. Diliman, Quezon City, Philippines.

PNS/BAFPS 13:2004. **Fresh Fruits – Mango-Specifications**. Bureau of Agriculture and Fisheries Product Standards. Department of Agriculture. Diliman, Quezon City, Philippines.

PNS/BAFPS 09:2004. **Fresh Fruits – Pineapple-Specification**. Bureau of Agriculture and Fisheries Product Standards. Department of Agriculture. Diliman, Quezon City, Philippines.

R.A. 3720. **Food, Drugs and Cosmetic Act.** Bureau of Food and Drugs. Department of Health. Alabang, Muntinlupa City, Philippines.

FORMULATING BODY
Development of Standards for Selected Ethnic Food Products

BFAD Philippine National Standards for Food Products

1. Ms. Ofelia M. Alba	-	Chief, Laboratory Service Division
2. Ms. Virginia Francia C. Laboy	-	OIC, Policy, Planning & Advocacy Division
3. Ms. Liberty V. Importa	-	Nutritionist-Dietitian IV
4. Ms. Almueda C. David	-	Food-Drug Regulation Officer IV
5. Ms. Charina May T. Tandas	-	Food-Drug Regulation Officer III
6. Ms. Maria Theresa C. Cerbolles	-	Food-Drug Regulation Officer III
7. Ms. Carmencita S. Masangkay	-	Food-Drug Regulation Officer II

Funding Agency

Ms. Grace Estillore Ms. Czarina C. Resurrection	-	Philippine Council for Industrial and Energy Development Department of Science and Technology

Technical Working Group

Academe:

Prof. Teresita P. Acevedo	-	Project Leader University of the Philippines College of Home Economics
Ms. Bernarda G. Dreje	-	Project Assistant

Government Agencies:

Ms. Charina May Tandas Ms. Caroline Duller	-	Department of Health Bureau of Food & Drugs
Dr. Gilberto Layese Mr. Mary Grace Mandigma	-	Department of Agriculture Bureau of Agriculture Fisheries Product Standards
Ms. Norma Hernandez Ms. Myra F. Magabilin Ms. Rose Marie Castillo Ms. Myrna Almarines	-	Department of Trade & Industry Bureau of Product Standards Food Products Bureau Export Trade & Promotions

Testing/Research:

Ms. Teresita S. Palomares Ms. Ma. Dolor L. Villasenor	-	Department of Science and Technology Industrial Technology Development Institute

Professional/Industry Association:

Dr. Elias E. Escueta	-	Philippine Chamber of Food Manufacturers Incorporated (PCFMI) Philippine Association of Food Technologists (PAFT)

Foor Industry:

Ms. Marilou Florendo	-	Integrated Food Manufacturers Association of the Philippines (INFORMAPP)
Ms. Clarissa Cavero	-	Philippine Food Processors and Exporters Organization Inc. (PHILFOODEX)