

# PHILIPPINE NATIONAL STANDARD

PNS/FDA 29:2010  
ICS 67.080.10

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**Recommended code of practice for the  
processing and handling of processed  
pili nut products**



**BUREAU OF PRODUCT STANDARDS**

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## Foreword

The Philippine National Standard for Processed pili nut products was drafted simultaneously with the Recommended code of practice for the processing and handling of processed pili nut products by the Technical Working Group (TWG) under the project entitled "Development of Standards for Ethnic Food Products". This was then reviewed, finalized and endorsed for adoption by the Food and Drug Administration as the Philippine National Standard and Recommended Code of Practice.

The development undergone different phases: the establishment of Technical Working Group composed of representatives from different stakeholders, initial drafting, survey on existing practices of the processors, analysis of the products, public consultation, finalization of the draft and adoption.

Public consultation workshop was held in the Center for Health Development Region V – Legazpi City where products are commonly produced. Different stakeholders contributed their expertise in the draft.

The Philippine National Standard and Recommended Code of Practice were developed to set the high standard of the product, have guide for the assurance of its quality and safety, harmonize export requirements, and make the products more competitive in the world market.

**Recommended code of practice for the processing and handling  
of processed pili nut products**

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**1 Scope**

This Code of Practice is concerned with the receipt of raw materials and ingredients, preparation and processing of processed pili nut products as defined in this Code, in order to conform with the required standards stated in **PNS/FDA 28:2010 Philippine National Standard for Processed pili nut products**. The product shall be prepared from fully ripened kernels of cultivars grown from *Canarium ovatum* Engl. This Code is intended to provide guidelines to achieve compliance with the standards for processed pili nut products packed in any suitable container.

**2 References**

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

**3 Definition of terms**

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

**3.1****afatoxins**

secondary metabolites known to be toxic to humans and are produced by fungi belonging to the genus *Aspergillus* including *A. flavus*, *A. parasiticus*, *A. vesicolor* and *A. indulans* on suitable hosts/substrates such as peanut, corn, copra, cassava and other oilseeds

**3.2****container**

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

**3.3****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

**3.4****food**

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

**3.5****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, Drugs and Cosmetic Act)

**3.6****food standard**

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

**3.7****glazing**

coating of food with substances such as syrups and glazing agents (food additives), giving the food a glossy appearance or protective outer layer

**3.8****free fatty acid**

amount of fatty acids in the product, liberated from fats and oils through hydrolysis and used as a quality indicator of hydrolytic rancidity

**3.9****ingredient**

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

**3.10****kernel**

the inner portion of the seed with the seed coat intact

**3.11****label**

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

**3.12****labeling**

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

**3.13**

**lot**

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

**3.14**

**mycotoxin**

toxic secondary products produced from the metabolism of molds

**3.15**

**moisture content**

the percentage weight of water in relation to the dry weight of the product

**3.16**

**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 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

**3.17**

**peroxide value**

is a measure of the primary oxidation products such as peroxides and hydroperoxides that develops in oils or fats and used as an indicator of oxidative rancidity

**3.18**

**pili nut**

the kernel of an indigenous crop pili, *Canarium ovatum* Engl., which is native to the Philippines belonging to the family Burseraceae

**3.19**

**rancidity**

formation of off-flavors in food due to lipid oxidation (oxidative rancidity) and/or release of free fatty acids by lipolysis (hydrolytic rancidity)

**3.20**

**roasting**

a cooking method which subjects the food to dry heat, whether from an open flame, oven, or other heat source; causing physico-chemical changes such as browning, caramelization, flavor development, and moisture reduction

**3.21**

**seedcoat or testa**

light brown to brownish papery covering of a kernel

**3.22****shell**

the endocarp of hard stony covering of a kernel after removing the violet to black pulp (exocarp) and the fibrous flesh (mesocarp)

**3.23****sweetening agent**

includes one or more of the sugars, honey, high intensity sweeteners and artificial sweeteners

**3.24****water activity**

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

**4 Raw materials, ingredients and packaging material requirements**

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

**4.1.1 Basic ingredient**

**4.1.1.1 Pili nut** – Kernels to be used shall be fresh, sound, clean and mature. It must conform to the requirements prescribed by PNS/BAFPS 34: 2005 (Philippine National Standard: Pili Nuts).

**4.1.2 Optional ingredients**

**4.1.2.1 Salt** – Salt to be used should be coarse or fine sodium chloride of food grade quality and must meet the purity requirements as specified in Section 4.1 of the Implementing Rules and Regulations of the ASIN Law, Republic Act (RA) 8172, An Act Promoting Salt Iodization Nationwide.

**4.1.2.2 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.

**4.1.2.3 Other ingredients** – All other ingredients to be used shall be of food grade quality and conform to all applicable food standards (e.g. chocolate, cinnamon, sesame seeds, garlic, and spices).

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

**4.1.2.5 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.

**4.2 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.

## **5 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)), the Recommended International Code of Hygienic Practice for Tree Nuts (CAC/RCP 6-1972), 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.

## **6 Preparation and processing**

The preparation of processed pili nut products is described from the receipt of raw materials until the packing operations. The production process should be supervised by personnel with adequate technical training and experience.

### **6.1 Preparation of raw materials and ingredients**

#### **6.1.1 Pili nuts**

##### **6.1.1.1 Receipt**

Pili Nuts of any variety shall only be accepted if it is sound and suitable for processing, according to the requirements stipulated in sub-subsection 4.1.1. Those found of contamination which could not be removed to acceptable levels by normal plant sorting or preparation procedures should be rejected. Special precautions must be taken to reject nuts showing signs of mold growth because of the probable presence of mycotoxins.

##### **6.1.1.2 Inspection and sorting**

Pili nuts shall be inspected and sorted according to quality and weight before processing (PNS/BAFPS 34:2005. Philippine National Standard: Pili nuts). Sorting may be carried out on moving inspection belts or sorting tables.

If prepackaged pili nuts are to be used as raw material, choose only those contained in clean, non-toxic, and properly labeled packaging materials.

#### **6.1.1.3 Storage/holding**

Pili nuts held for processing should be stored in any suitable type of closed container to protect from domestic animals, parasites, chemical or microbiological contaminants, debris, and dust. Clean sacks may be used for pili nut storage, provided that they are stacked in pallets, stored in a lighted, well-aerated room, and are not in contact with the walls of the storage facility to prevent contact with moisture.

Regular inspection of the storage facility should be done to avoid infestation. Humidity levels conducive to mold growth and mycotoxin production should be avoided.

#### **6.1.1.4 Washing and/or sanitizing**

Pili nuts are washed to remove dirt, dust, soil, insect, mold spores, plant parts and filth that might contaminate or affect the color, aroma or flavor of the kernels. Water used for washing and rinsing should be of potable quality. Sanitizing agents may be used in the wash or rinse water.

### **6.1.2 Optional ingredients**

#### **6.1.2.1 Receipt**

Optional ingredients to be used in the preparation of processed pili nut products shall conform to the requirements stipulated in sub-subsection 4.1.2. Whenever applicable, certificates of analyses (COA) from ingredient suppliers shall be secured to confirm their suitability for processing. Ingredients shall be rejected if they do not conform to the requirements and are found to have signs of deterioration, decomposition, or contamination to an extent which renders them unfit for human consumption.

#### **6.1.2.2 Storage/holding**

Optional ingredients shall be in closed containers as protection against infestation by domestic animals, parasites, filth, and chemical and microbiological contaminants. Storage requirements such as temperature and humidity may vary depending on the ingredient, and these should be provided accordingly by the storage facilities to be used.

Stored stocks of ingredients should be used on a "first in-first out" (FIFO) or a "first to expire-first to use" (FEFU) basis.



## **6.2 Processing operations**

### **6.2.1 Roasting**

Pili nuts are roasted with intact seedcoat/testa. Roasting is done either by placing the kernels evenly on a sheet pan and roasting in an oven at 176.67 °C (350 °F) for five to ten minutes, or in a dry frying pan over high heat while constantly stirring the kernels to avoid burning.

### **6.2.2 Seedcoat/testa removal**

The seedcoat/testa of the pili nuts may be removed, depending on the desired finished product. The kernels are blanched in boiling water sufficient to loosen the testa, and then cooled. The testa may be separated from the kernel either mechanically or manually. Peeled kernels are air-dried and packed in plastic containers. For split-kernel pili nut products, kernels are split lengthwise while being cooled.

### **6.2.3 Other treatments**

**6.2.3.1 Split kernel products** – Split kernels are roasted and then mixed with thick syrup made from approved sweetening agents. Other approved ingredients to coat the kernels may be added.

**6.2.3.2 Ground kernel products** – Whole or broken kernels without seedcoat/ testa are ground using sanitized food-grade grinding equipment. Oil from the kernels may be extracted before mixing with other ingredients. The resulting mixture may be baked, roasted or boiled, depending on the finished product desired. The mixture may be cut according to the desired size and shape. Larger-sized kernels may be added as decoration.

### **6.2.4 Addition of other ingredients**

Food additives and other components for the preparation of the intended finished products may be added.

## **6.3 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.

## **6.4 Closing or sealing of containers**

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

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

## 6.5 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.

## 6.6 Post-process container handling

Mechanical shocks leading to breakage of semi-rigid containers due to container abuse must be avoided. These occur by knocking against each other during conveying, packaging and labeling operations, among others.

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

## 7 Food additives

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 processed pili nut products.

## 8 Labeling

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

**8.1.1** The name of the product shall be "Pili Nuts", It shall be preceded by additional descriptors as to forms and styles (e.g. "Roasted Pili Nuts", "Sugar-Coated Pili Nuts", "Honey-Glazed Pili Nuts"). The product may be called by other common names provided that such are accepted in the country of distribution.

**8.1.2** The complete list of ingredients and food additives used in the preparation of the product in descending order of proportion.

**8.1.3** 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.

**8.1.4** The name and address of the manufacturer, packer and/or distributor of the food.

**8.1.5** 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.

8.1.6 Lot or code number identifying product lot.

8.1.7 The words "Product of the Philippines", or the country of origin if imported.

8.1.8 Additional requirements.

A pictorial representation of raw material on the label should not mislead the consumer with respect to the raw material so illustrated.

## 8.2 Nutrition labeling

Nutrition labelling shall conform to established regulations of BFAD.

**Table 1 – Food additives for "Processed pili nut products"  
(BFAD B.C. No.016 s. 2006. Updated List of Food Additives)**

Function	Additive	Maximum Level
A. Antioxidant	Ascorbyl esters	200 mg/kg (as ascorbyl stearate)
	BHA	200 mg/kg (fat or oil basis)
	EDTA	200 mg/kg (as anhydrous calcium disodium EDTA)
	Mineral oil	200 mg/kg
	Gallate, Propyl	200 mg/kg (fat or oil basis)
	Sorbates	1000 mg/kg (as sorbic acid)
	Tocopherols	1500 mg/kg
B. Color	Allura red AC	100 mg/kg
	Azorubine	100 mg/kg
	Brilliant black PN	100 mg/kg
	Brilliant blue FCF	100 mg/kg
	Brown HT	100 mg/kg
	Canthaxanthin	8.2 mg/kg
	Caramel color class III	GMP
	Caramel color class IV	GMP
	Carmines	100 mg/kg
	Carotenes, Vegetable	GMP
	Carotenoids	GMP
	Chlorophylls, Copper complexes	GMP
	Curcumin	100 mg/kg
	Grape skin extract	GMP
	Indigotine	100 mg/kg
	Iron Oxides	GMP
	Ponceau 4R	100 mg/kg
	Quinoline yellow	100 mg/kg
	Riboflavines	GMP
	Sunset yellow FCF	100 mg/kg
Tartrazine	100 mg/kg	
C. Sweetener	Acesulfame potassium	1000 mg/kg
	Aspartame	1000 mg/kg
	Saccharin	500 mg/kg
	Sucralose	150 mg/kg
D. Preservative	Hydroxybenzoates, P-	300 mg/kg (as p-hydroxybenzoic acid)
	Phosphates	1100 mg/kg (as phosphorus)
	Sulphites	500 mg/kg (as residual SO <sub>2</sub> )
E. Emulsifier/Stabilizer	Sorbitan esters of fatty acid	5000 mg/kg
	Diacyltartaric and fatty acid esters of glycerol	GMP
F. Humectant	Propylene glycol	50000 mg/kg
	Tartrates	1300 mg/kg (as tartaric acid)

\* Based on the Food Category System: 04.2.2.2 Dried Vegetables, Seaweeds, Nuts and Seeds; 15.2 Processed nuts, including coated nuts and nut mixtures (with e.g. dried fruit)

## **9 Quality assurance**

### **9.1 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.

### **9.2 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.

### **9.3 Good manufacturing practices (GMP)**

Processing establishments shall have developed, documented and implemented prerequisite programs based on BFAD's Current Good Manufacturing Practices (cGMP) and Hygiene Control. An effective GMP and Hygiene Control program will decrease the number of critical control points that a manufacturer must face during the hazard analysis of the product/process.

## **10 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 fluctuations in temperature and humidity during storage and transport of the product must be avoided to prevent product deterioration.

## **11 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.

## **12 End product specifications**

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

**12.2** To the extent possible in good manufacturing practices, the products shall be free from any objectionable characteristics.

**12.2** The product shall not contain any toxic substances originating from microorganisms and chemicals.

**12.3** The product shall be free from chemical pollutants in amounts which may pose hazard to health.

**12.4** 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**  
 Philippine National Standards for Drinking Water 2007 (DOH AO 2007-0012)

**Table A.1 – Standard values for bacteriological quality**

Parameter	Value/Unit	Point of compliance
Total coliform	< 1.1 MPN/100 ml	Service reservoir Water treatment works Consumers' taps Refilling stations Water haulers Water vending machines
Fecal coliform	< 1.1 MPN/100 ml	Service reservoir Water treatment works Consumers' taps Refilling stations Water haulers Water vending machines Point sources - Level 1
Heterotropic plate count	< 500 CFU/ml	Service reservoir Water treatment works Consumers' taps nearest meter Refilling stations Water vending machines

**Table A.2 – Standard values for physical and chemical quality for acceptability aspects for drinking water**

Constituents	Maximum level (mg/L) or Characteristic	Constituents	Maximum level (mg/L) or Characteristic
Taste	No objectionable taste	Hydrogen sulfide	0.05
Odor	No objectionable odor	Iron	1.0
Color	Apparent = 10 color units True = 5 color units	Manganese	0.4
Turbidity	3 NTU	pH	6.5 – 8.5
Aluminum	0.2	Sodium	200
Chloride	250	Sulfate	250
Copper	1.0	Total dissolved solids	500
Hardness	300 as CaCO <sub>3</sub>	Zinc	5.0

**Table A.3 – Standard values for organic and inorganic chemical constituents of health significance in drinking water**

*Inorganic chemicals*

Constituents	Maximum level (mg/L)	Constituents	Maximum level (mg/L)
Antimony	0.02	Fluoride	1.0
Arsenic	0.05	Lead	1.01
Barium	0.7	Mercury (total)	0.001
Boron	0.5	Nickel	0.02
Cadmium	0.003	Nitrate	50
Chromium (Total)	0.05	Nitrite	3.0
Cyanide (Total)	0.07	Selenium	0.01

*Organic chemicals*

Constituents	Maximum level (mg/L)	Constituents	Maximum level (mg/L)
Benzene	0.01	Ethylbenzene	0.30
Carbon tetrachloride	0.004	Nitriotriacetic acid (NTA)	0.20
1,2-Dichlorobenzene	0.1	Polyaromatic hydrocarbons (PAHs)	0.20
1,4-Dichlorobenzene	0.5	Polynuclear aromatic	0.0007
1,2-Dichloroethane	0.003	Tetrachloroethene	0.02
1,1-Dichloroethene	0.05	Styrene	0.04
1,2-Dichloroethene	0.07	Tetrachloroethene	0.70
Dichloromethane	1.0	Trichloroethene	0.07
Di(2-ethylhexyl) phthalate	1.01	Vinyl chloride	0.0003
Edetic Acid (ADTA)	0.001	Xylene	0.5

*Organic pesticides*

Constituents	Maximum level (ug/L)	Status in the Philippines
Aldrin and Dieldrin (combined)	30.0	Banned
Atrazine	0.03	Registered
Carbofuran	2.0	Registered
Chlordane	7.0	Banned
DDT **	0.2	Banned
1,2-Dibromo-3-chloropropane (DBCP)	1.0	Banned
2,4-Dichlorophenoxyacetic acid (2,4-D)	1.0	Registered
Endrin	30.	Banned
1,2-Dibromomethane (Ethylene dibromide)	0.6	Banned
Heptachlor and Heptachlor epoxide (combined)	0.03	Banned
Lindane	2.0	Restricted
MCPA (4-(2-methyl-4-chloro) phenoxy acetic acid	2.0	Registered
Pendimethalin	20.0	Registered
Pentachlorophenol (PCP)	9.0	Banned

## References

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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.

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*your partner in product quality and safety*



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