

# PHILIPPINE NATIONAL STANDARD

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Frozen milkfish



**BUREAU OF PRODUCT STANDARDS**

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**Foreword**

The Philippine National Standards (PNS) for Frozen milkfish was prepared as part of the project of the Bureau of Agriculture and Fisheries Products Standards (BAFPS) with the Bureau of Agricultural Research (BAR) entitled "Quality Standardization on Selected Fishery Products". A technical working group (TWG) was created through Special Order Number 100 Series of 2006 identifying members and experts that shall be involved in the formulation the draft standards for fishery products.

In collaboration with the industry and the regional offices of the Bureau of Fisheries and Aquatic Resources (BFAR), the TWG presented the draft standards for public consultation in Dagupan City, Aklan and Quezon City.

The PNS for Frozen milkfish aims to provide common understanding on the scope of the standard, product description, classifications, essential composition and quality factors, hygiene and handling, packaging and labeling requirements, methods of analyses and sampling, and definition of defectives.

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**Frozen milkfish**

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**1 Scope**

This standard prescribes quality specifications and safety requirements and methods for determining these for frozen milkfish (*Chanos chanos*, Forskal) prepared in the following forms:

- Whole
- Deboned
- Choice cuts

**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 standard, the following terms shall mean:

**3.1  
chilling**

a process by which the temperature of the fish is lowered to a point near the freezing point of water (0 °C) but not below it by means of heat withdrawal

**3.2  
chilled fish**

fresh fish, which has been subjected to a chilling treatment and stored at a temperature close to 0 °C but not above 4 °C

**3.3  
cleaning**

means the removal of soil, food residues, dirt, grease or other objectionable matter from surfaces

**3.4  
deboning**

the process of removing most of the intermuscular bones / spines from the fish

**3.5  
dehydration**

the loss of moisture from the frozen product due to prolonged cold storage

**3.6  
fish**

generic term used to refer to aquatic animals such as fish, crustaceans (crabs, prawns, lobsters) and mollusks (clams, mussels, oysters, scallops, octopus, squids etc.)

**3.7**

**fishery/aquatic products**

includes all other products of aquatic living resources in any form

**3.8**

**fresh fish**

freshly caught fish, which has received no treatment other than chilling and exhibiting no deteriorative changes

**3.9**

**freezing**

a process which is carried out in appropriate equipment in which the initial temperature of the product is reduced to  $-18\text{ }^{\circ}\text{C}$  or lower with most of the tissue water turning into ice. The process shall not be regarded as complete unless and until the product temperatures has reached  $-18\text{ }^{\circ}\text{C}$  ( $0\text{ }^{\circ}\text{F}$ ) or lower at the thermal centre after thermal stabilization

**3.10**

**quick freezing**

a freezing rate at which no part of the fish takes more than two hours to cool from  $-1\text{ }^{\circ}\text{C}$  to  $-5\text{ }^{\circ}\text{C}$ , which further reduction of the temperature at the end of the freezing period to the recommended cold storage temperature

**3.11**

**frozen fish**

fresh fish, which have been subjected to a freezing process and stored at  $-18\text{ }^{\circ}\text{C}$  or lower

**3.12**

**food**

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

**3.13**

**food additive**

substances other than the basic food stuff present in the food as a result of any aspect of production, processing, storage or packaging excluding chance contaminants

**3.14**

**glazing**

a process in which a thin protective layer of ice is allowed to form on the surface of the frozen fish by spraying it with, or dipping it in potable water at  $0\text{ }^{\circ}\text{C}$  in order to prevent dehydration and oxidation of the frozen product

**3.15**

**gutted fish**

fish that has been eviscerated or had the entrails removed

**3.16**

**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

**3.17****potable water**

water fit for human consumption and in which potability has been determined by health authorities cited in PNS for Drinking Water (PNS 991:1993 - Agricultural and other Food Products – Bottled Drinking Water Specifications)

**4 Description**

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

**4.1 Product definition****4.1.1****frozen whole milkfish**

Whole milkfish (bangus), after any suitable preparation, subjected to a quick freezing process and cold stored at -18 °C or lower

**4.1.2****frozen deboned milkfish**

fresh-chilled milkfish carefully deboned, washed in brine, drained, packed, frozen and cold stored at -18 °C or lower

**4.1.3****frozen milkfish choice cuts**

choice cuts (e.g., belly, fillet) prepared from fresh-chilled milkfish, washed in brine, drained, packed, frozen and cold stored at -18 °C or lower

**4.2 Process definition****4.2.1****frozen whole milkfish**

fresh chilled milkfish washed, arranged in shelves, quick frozen until the product temperature has reached -18 °C or lower

**4.2.2****frozen deboned milkfish**

product prepared by the deboning process as defined in 2.10.2.1, subjected to quick freezing treatment and cold stored at -18 °C or lower

**4.2.2.1****deboning/freezing processes**

The product is prepared by weighing, washing and splitting by cutting along the dorsal side, spreading and removing the gut. It is washed in cold, clean water and deboned by means of hand with the use of forceps and knives, and individually checked to ensure that only one percent (1 %) of the total number of bones in the body (2 pieces) and three vertebral spines protruding from the tail may be allowed. The deboned milkfish are dipped in 1 % cold brine solution, drained weighed, packed, frozen and cold stored at -18 °C or lower

**4.2.3****frozen milkfish choice cuts (belly and fillet)**

fresh chilled milkfish choice cuts are washed in potable water or brine arranged in shelves, packed, frozen and cold stored at -18 °C or lower

## 5 Essential composition and quality factors

### 5.1 Fish

The fresh fish must conform to the quality parameters as defined in Annexes B and C.

### 5.2 Glazing

If glazed, the water used shall be of potable quality. Potability of water should meet the standard parameters and values for bacteriological, physico-chemical, and aesthetic quality of drinking water (PNS for Drinking water, 1993).

### 5.3 Other ingredients

All other ingredients shall be of food grade quality and shall conform to all applicable Codex standards.

#### 5.3.1 Water

Water fit for human consumption and in which potability has been determined by health authorities cited in PNS for Drinking Water (PNS 991: 1993 Agricultural and other Food Products).

### 5.4 Final product

5.4.1 The final product shall meet all the chemical fish freshness indices in Table 1.

**Table 1 – Chemical fish freshness indices of frozen milkfish**

Chemical parameter	Limit
Total Volatile Bases-Nitrogen (TVB-N)	20 – 30 mg N/100g
Trimethylamine- Nitrogen (TMA-N)	5 – 10 mg N/100g
Histamine	10 mg/100g or 100 ppm
Peroxide Value	10 – 20 meq/kg
pH	6.2 – 6.9
Hypoxanthine	2 – 3 $\mu$ mole/g
K-value	$\leq$ 20 %
Sources: BFAR-FAO No. 210 series of 2001 Laboratory Techniques in Food Analysis, Pearson 1972 edition Seafood: Resources Nutritional Composition and Preservation, Chapter 4.	

5.4.2 The final product shall conform to the microbial requirements in Table 2.

**Table 2 – Microbiological criteria for frozen milkfish**

Microbiological parameter	Limit
1. Aerobic Plate Count (APC)	500,000 /g
2. <i>Staphylococcus aureus</i>	1,000 /g
3. <i>Escherichia coli</i>	11/g
4. <i>Salmonella</i>	Absent in 25 g
5. <i>Shigella</i>	Absent in 25 g
Source: International Commission on Microbiological Specifications for Food (ICMSF), 1986	

5.4.3 The final product shall possess the following size characteristics:

**Table 3 – Size classification – Frozen whole milkfish**

Size	Weight range (g)
Small	< 200
Medium	200-249
Large	250-300
Extra Large	>350

**Table 4 – Size classification of frozen deboned milkfish**

Size	Weight range (g*)
Small	<150
Medium	150 – 186
Large	187 – 225
Extra Large	>350
* Recovery rate calculated at 75% or higher	

## 6 Hygiene and handling

6.1 The final product shall be free from any foreign materials, which may represent a hazard to health

6.2 When tested by appropriate methods of sampling and examination, the product:

- a) Shall be free from microorganism in amounts which may represent a hazard to health;
- b) Shall not contain histamine that exceeds 10 mg/100 g; and

- c) The final product shall conform to the sampling plans (Annex A) and to the microbiological and chemical requirements as described in Tables 1 and 2, respectively.

## **7 Presentation, packaging and labeling**

### **7.1 Presentation**

**7.1.1** The products shall be presented as frozen whole milkfish, frozen deboned milkfish, and frozen milkfish choice cuts.

**7.1.2** Individual retail or bulk container shall contain only one species of fish, which are relatively uniform in size.

### **7.2 Packaging**

**7.2.1** The product shall be packed in containers made of suitable films or laminates that are clean and free from any foreign matter or contaminants.

### **7.3 Labeling**

#### **7.3.1 Labeling or retail packages/container**

Each retail product package shall be labeled and marked with the following information in accordance with BFAD Administrative Order No. 88-B series of 1984 (*Rules and Regulations Governing the Labeling of Prepackaged Food Products Distributed in the Philippines*):

**7.3.1.1** The name of the product. The word quick frozen shall be followed by the common names or usual name of the species, the label in the case of eviscerated fish, shall include the terms indicating that the fish has been eviscerated and deboned;

**7.3.1.2** The mark/label plastic pouches with prescribed sizes (S, M, L, or XL) and batch number;

**7.3.1.3** The label shall state that the product should be maintained under conditions that will maintain the quality during transport, storages, storage and distribution;

**7.3.1.4** The words “best before” followed by the date, month and year indicating end of the period at which the product shall retain its optimum quality attributes at a stated storage condition;

**7.3.1.5** The label shall state that the product should be maintained under conditions that will maintain the quality during transportation, storage and distribution;

**7.3.1.6** The name “Product of the Philippines;”



**7.3.1.7** The name and address of manufacturer/distributor (or area of production/harvest area);

**7.3.1.8** Net weight; and

**7.3.1.9** Lot number.

### **7.3.2 Labeling of Non-retail container**

The name of the product, lot identification and the name and address of the manufacturer or packer shall appear in the container. However, lot identification, and the name and address maybe replaced by an identification mark, provided that such mark is clearly identified with the accompanying documents.

## **8 Methods of analyses and sampling**

### **8.1 Method of Sampling**

**8.1.1** Sampling of lots for physico-chemical examination of the product shall be in accordance with sampling plans provided in Annex A based on FAO/WHO Codex Alimentarius Commission Sampling Plans for Prepackaged Foods (AQL=6.5) (CAC/rm42-1969). A sample lot (N) shall be the quantity of the product under similar conditions. A sample unit shall be the primary container where the product is in bulk; while the individual fish is the sample unit for retail packaged products.

**8.1.2** For microbiological analyses, the ICMSF (1978) suggested Case 2, 3 Class sampling Plan is recommended as defined in Annex B.

### **8.2 Methods of analyses**

#### **8.2.1 Determination of peroxide value**

According to the Association of Official Analytical Chemists (AOAC), 2001, 12<sup>th</sup> Edition.

#### **8.2.2 Determination of histamine**

According to the Fluorometric Method of AOAC 933.13 (AOAC, 1990)

#### **8.2.3 Determination of aerobic plate count**

According to the procedure described by FDA Bacteriological Analytical Manual (BAM), published by AOAC, 2001, 12<sup>th</sup> Edition.

#### **8.2.4 Determination of coliform and *escherichi coli* organism**

According to the procedure described by FDA Bacteriological Analytical Manual (BAM), published by AOAC, 2001, 12<sup>th</sup> Edition.

### **8.2.5 Determination of *staphylococcus aureus***

According to the procedure described by FDA Bacteriological Analytical Manual (BAM), published by AOAC, 2001, 12<sup>th</sup> Edition.

## **9 Definitions of defectives**

A sample unit shall be considered defective when it exhibits any of the properties defined below.

### **9.1 Freezer burn**

More than 10% of the declared weight of the frozen whole, deboned or choice cut milkfish is affected by dehydration evident in more than 10% of the surface area.

### **9.2 Foreign matter**

The presence in the sample unit of any matter which has not been derived from fish (excluding packaging material), which poses a threat to human health and is readily recognized without magnification or is present at a level determined by any method including magnification that indicates non-compliance with good manufacturing and sanitation practices.

### **9.3 Odor and flavor**

Presence of persistent and distinct objectionable odor and flavor upon thawing indicative of decomposition (ammoniacal, putrid, rancid, sour, etc.)

### **9.4 Flesh abnormalities and appearance**

Flesh exhibiting freezer burn (white chalky appearance) and pasty consistency upon thawing and characterized by loosening of scales, bruises on fish skin and extreme mutilation. Presence of undesirable parts or incidence of viscera.

## Annex A

**Sampling plans for pre-packaged foods  
CAC/RM42-1969\***

<b>Sampling plan 1 Normal operations (Inspection Level 1, AQL** = 6.5)</b>		
Net weight is equal to or less than 1 kg (2.2 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
4,800 or less	6	1
4,901 – 24,000	13	2
24,001-48,000	21	3
48,001 – 84,000	29	4
84,001-144,000	48	6
144,001 –240,000	126	13
Net weight is greater than 1 kg (2.2 lb) But no more than 4.5kg (10 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
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	13
Net weight is greater than 4.5 kg (10 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
600 or less	6	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

<b>Sampling plan 2 In case of disputes (Inspection level 1, AQL = 6.5)</b>		
Net weight is equal to or less than 1 kg (2.2 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
4,800 or less	6	1
4,901 – 24,000	13	2
24,001-48,000	21	3
48,001 – 84,000	29	4
84,001-144,000	48	6
144,001 –240,000	126	13
More than 240,000	200	19
Net weight is greater than 1 kg (2.2 lb) But no more than 4.5kg (10 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
2,800 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
74,001 –120,000	126	13
More than 120,000	200	19
Net weight is greater than 4.5 kg (10 lb)		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
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

\* **FAO/WHO Codex Alimentarius Commission  
Sampling plans for pre-packaged foods  
CAC/RM42-1969**

\*\* **Acceptance Quality Level**

## 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.

AOAC International 1990. Determination of Histamine through Fluoremetric Method. AOAC 933.13

BFAD, 1996. Administrative Order No. 39. Standards of Quality and Requirements for the Processing, Packaging and Labeling of Bottled Drinking Water. Bureau of Food and Drugs. Alabang, Muntinlupa City.

FAO/WHO CAC/RM2-1969. Sampling Plans for Pre-packaged Foods. Food and Agriculture Organization/World Health Organization Codex Alimentarius Commission. Rome, Italy.

Japanese Association of Oil Chemists, 1972. Standard Methods of Oil Analysis in Japan. (1972) 2(4):12:71.

International Commission on Microbiological Specifications for Food (ICMSF), 1986.

ICMSF, 1978. Determination of Coliform and *Escherichi coli* organism. International Commission on Microbiological Specifications for Food.

ICMSF, 1978. Determination of *Staphylococcus aureus*. International Commission on Microbiological Specifications for Food (ICMSF)

Republic Act No. 8172. An Act Promoting Salt Iodization Nationwide and for Related Purposes and Its Implementing Rules and Regulations. Published by the National Nutrition Council, 1996.

Small Scale Processing of Fish. Technical Memorandum No. 3. Technology Series International Labor Office. Geneva. 1982.

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