

# PHILIPPINE NATIONAL STANDARD

PNS/BAFS \_\_\_\_\_:2015  
ICS \_\_\_\_\_

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## Pasteurized Crab Meat



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## **Foreword**

This Philippine National Standard (PNS) for Pasteurized Crab Meat (PNS/BAFS\_\_\_\_:2015) was developed by the Technical Working Group (TWG) organized by the Bureau of Agriculture and Fisheries Standards (BAFS) through a Department of Agriculture (DA) Special Order No.734, Series of 2014.

The TWG is composed of members representing the Bureau of Fisheries and Aquatic Resources (BFAR), Department of Science and Technology – Industrial Technology Development Institute (DOST-ITDI), University of the Philippines Visayas – College of Fisheries and Ocean Sciences (UPV-CFOS), Philippine Association of Crab Processors, Incorporated (PACPI) with BAFS as Technical Secretariat.

The proposed standard was presented and reviewed during the consultative meetings with the concerned stakeholders conducted in the cities of Naga (Region V), Iloilo (Region VI), Mandaue (Region VII), Zamboanga (IX) and Quezon (Region NCR). Comments gathered during the consultations were carefully evaluated by the TWG and included accordingly in the final version of this standard.

This PNS for Pasteurized crab meat aims to provide a common understanding on the scope of the standard, product description, process description, essential composition and quality factors, food additives, contaminants, hygiene and handling, packaging and labeling, methods of sampling, examination and analysis, definition of defectives and lot acceptance.

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**Pasteurized Crab Meat**

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## 1 Scope

This standard applies to crab meat obtained from blue swimming crab (*Portunus pelagicus*) locally known as “alimasag” that has been cooked, pasteurized and chilled, intended for consumption with or without cooking and for further processing.

## 2 References

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

## 3 Definition of terms

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

**3.1 Butchering** refers to the process of removing crab back shell, viscera and gills. In some fisheries it may also include the removal of walking legs and claws. Butchering may take place either before or after cooking. (CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013).

**3.2 Chilling** refers to the process of cooling pasteurized crab meat to a temperature approaching that of melting ice. (CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013)

**3.3 Cooking** refers to a heating method of crabs using potable water, clean sea water or brine for a period of time sufficient for the thermal center to reach a temperature adequate to coagulate the protein. (modified from CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013)

**3.4 Contaminant** refers to any biological or chemical agent, foreign matter or other substances not intentionally added to food that may compromise food safety or suitability. (CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013)

**3.5 Hazard** refers to a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect. (CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013)

**3.6 Hermetically sealed container** refers to containers which are designed and intended to protect the contents against the entry of viable microorganisms after closing. (CAC/RCP 40-1993)

**3.7 Label** refers to any tag, brand, mark, pictorial, or other descriptive matter, written, printed, stenciled, marked, embossed or impressed on, or attached to, a container of food. (CODEX STAN 1-1985, Amend.7-2010)

**3.8 Labeling** refers to any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal. (CODEX STAN 1-1985)

**3.9 Lot** refers to a definitive quantity of a commodity produced essentially under the same conditions. (CODEX STAN 1-1985)

**3.10 Packaging** refers to the process of packing that is part of the production cycle applied to bulk product to obtain the finished product. Any material, including printed 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. (*BFAD AO 153 s. 2004*)

**3.11 Pasteurization** means subjecting crab meat to heat at pre-determined time and temperatures, which inactivates pathogenic micro-organisms of public health concern without noticeable changes in appearance, texture and flavor of the product. (*CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013*).

**3.12 Picking** refers to the process of removing meat from the crab shell by machine or by hand. (*CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013*)

**3.13 Ready-to-eat** refers to the status of the food being ready for immediate consumption at the point of sale. (*modified from Hongkong Centre for Food Safety, 2007*)

**3.14 Struvite crystals** refer to the transparent crystal of magnesium ammonium phosphate which forms during cooling stage following retorting and continues storage. The quantity of magnesium found in seafood and especially in the water used in processing the seafoods can be sufficient to cause formation of these crystals during the normal shelf-life of the product. (*CRC Handbook of Food Additives, Second Edition, Volume 1, Furia E. 1972*)

## **4 Description**

### **4.1 Product description**

Pasteurized crab meat is a ready-to-eat product obtained from different parts of the crab, singly or in combination, packed in hermetically sealed containers and stored at chilling condition.

### **4.2 Process description**

Pasteurized crab meat is processed from live blue swimming crabs that have been subjected to the following general steps:

- a) washing, cooking, cooling, butchering, picking and sorting using appropriate methods;
- b) packed in cans or other appropriate containers;
- c) pasteurized at sufficient time and temperature; and
- d) cooled using appropriate method

It is recommended that the blue swimming crab meat should be pasteurized to a minimum cumulative total lethality of  $F_{185}^0$  (F<sub>85</sub><sup>0</sup>C) = 31 minutes, where  $z = 16^0$ F (9<sup>0</sup>C). (*USFDA 2011. Fish and Fishery Products Hazards and Controls Guidance. Fourth Edition, April 2011. Chapter 16: Pathogenic Bacteria Survival Through Cooking or Pasteurization*)

## **5 Essential composition and quality factors**

### **5.1 Basic ingredients**

### 5.1.1 **Raw material**

Only live blue swimming crabs shall be used. Blue swimming crabs with carapace width of at least 10.2 cm (4 in) shall be used.

## 5.2 **Final product**

5.2.1 The final product shall meet the requirements of this standard when lots examined in accordance with Section 12-Lot acceptance and comply with the provisions set out in Section 11-Defenition of Defectives. Products shall be examined by the methods given in Section 10-Method, examination and analysis.

5.2.2 The final product shall conform to the following quality requirements for fill of containers or net weight and sensory properties.

### 5.2.2.1 Fill of containers or net weight

- a) Rigid container, like cans or plastic cups, should be well filled with the product, which should occupy not less than 90% (minus any necessary headspace according to good manufacturing practices) of the water capacity of the container. The water capacity of the container is the maximum volume of distilled water at 20°C that the sealed container can hold when completely filled.
- b) Flexible containers should be filled as full as commercially practicable.

### 5.2.2.2 Sensory properties

The product shall have the characteristic color, odor, taste and texture of the raw material.

5.2.3 The final product shall conform to the microbiological requirement in Annex A.

## 6 **Food additives**

Only Disodium diphosphate or Sodium acid pyrophosphate (Codex INS 450 (i)) is permitted at maximum level of 10mg/kg.

## 7 **Contaminants**

The products shall comply with the maximum level of contaminants as specified in Annex B.

## 8 **Hygiene and handling**

The products shall be prepared under hygienic conditions in accordance with the Revised Guidelines on Current Good Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food (DOH AO No. 153 s. 2004) and its future amendments, and the following Codex Recommended Codes of Practice (CAC/RCP):

- a) General Principles of Food Hygiene (CAC/RCP 1-1969); and
- b) Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003).

## **9 Packaging and labeling**

### **9.1 Packaging**

The product shall be packed in appropriate hermetically sealed containers, like cans and flexible containers (e.g. plastic cups) to safeguard the hygienic and other qualities of the food.

### **9.2 Labeling**

The product shall be labeled according to the provisions of the Codex General Standard for the Labeling of Prepackaged Foods (CODEX STAN 1-1985), the Rules and Regulations Governing the Labeling of Prepackaged Food Products Distributed in the Philippines (DOH-BFAD/FDA Administrative Order No. 88-B series of 1984) and its future amendments.

#### **9.2.1 Retail package/container**

Each retail product package shall be labeled and marked with the following information:

- a. The name of the product shall be “pasteurized and chilled crab meat”. The English or common/local name of the species used may be labeled. The products may be called by other common/local names provided that such names are accepted in the place/country of distribution;
- b. The net content by weight in metric system and/or number of pieces per pack. The net weight based on other systems of measurement required by importing countries shall appear in parenthesis after the metric net weight;
- c. The label shall state that the product must be stored under conditions to maintain the best quality during transport, storage and distribution (e.g. keep refrigerated);
- d. The words “Best/Consume Before/Use by Date” 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;
- e. The name and address of either of the following: manufacturer, packer, distributor, importer, exporter or vendor;
- f. The lot identification code/number;
- g. The words “Product of the Philippines” or the country of origin if imported; and

The pictorial presentation (optional). Pictorial presentation of the product on the label should not mislead the consumer with respect to the product so illustrated.

#### **9.2.2 Non-retail container**

Information on the above provisions shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer as well as storage instructions, shall appear on the container.

However, the lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

## **10 Methods of sampling, examination and analysis**

### **10.1 Method of sampling**

Sampling of lots for examination of the final product shall be in accordance with the General Guidelines on Sampling (CAC/GL 50-2004). A sample unit is the individually packed product or a 0.99% portion from bulk containers.

### **10.2 Method of sensory and physical examinations**

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with Annex C.

### **10.3 Method of Analysis**

#### **10.3.1 Determination of microorganisms in Annex A**

According to the procedure described by FDA Bacteriological Analytical Manual (BAM), published by AOAC (the latest edition) or an equivalent analysis method.

#### **10.3.2 Determination of heavy metals**

According to the Codex Recommended Methods of Analysis and Sampling (CODEX STAN 234-1999) or any equivalent analysis methods.

#### **10.3.3 Determination of fill of the container or net weight**

Sample units should be determined by the following procedure:

- a) Weigh the unopened container.
- b) Open the container and remove the contents.
- c) Weigh the empty container, including the end and any wrapping material, after removing excess liquid and adhering meat.
- d) Subtract the weight of the empty container and any wrapping material from the weight of the unopened container. The resultant figure is the net weight or net content.

#### **10.3.4 Determination of drained weight**

The drained weight of all sample units shall be determined by the following procedure:

- a) Maintain the container at a temperature between 20°C and 30°C for a minimum of 12 hours prior to examination.
- b) Open the container and distribute the contents on a pre-weighed circular sieve having a wire mesh with square openings of 2.8 mm x 2.8 mm.
- c) Remove all wrapping material and incline the sieve at an angle of approximately 17<sup>0</sup>-20<sup>0</sup> and allow the meat to drain two minutes, measured from the time the product is poured onto the sieve.
- d) Weigh the sieve containing the drained crab meat.
- e) Determine the weight of drained crab meat by subtracting the mass of the sieve from the mass of the sieve with drained product.

## **11 Definition of defectives**

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

### **11.1 Foreign matter**

Presence of any matter in the sample unit which has not been derived from crab meat (excluding packing material), does not pose 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.

### **11.2 Odor and flavor**

Distinct objectionable odors or flavors indicative of decomposition.

### **11.3 Texture**

Soft and mushy.

### **11.4 Discoloration**

Distinct discolorations characterized by the following:

- a) Blue, brown, black discolorations exceeding 5% by weight of the drained contents; or,
- b) Black sulphide staining of the meat exceeding 5% by weight of the drained contents.

### **11.5 Struvite crystals**

Any struvite crystals greater than 5 mm in length.

### **[11.6 Shell bits]**

Shell bits with 2 mm or greater, of more than ten (10) pieces.

This only applies to a product without shell.]

## **12 Lot of acceptance**

A lot shall be considered as meeting the requirements of this standard when:

- a) the total number of defective sample units as classified according to Section 11 does not exceed the acceptance number (c) of the appropriate sampling plan (AQL-6.5);
- b) the average net weight of all sample units is not less than the declared net weight, provided there is no unreasonable shortage in any individual container; and
- c) the essential composition and quality factors, food additives, contaminants, hygiene and handling, and labeling requirements of Sections 5, 6, 7, 8 and 9, respectively, are met.



## References

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

CAC/RCP 1-1969, Rev. 4-2003. Recommended International Code of Practice General Principles of Food Hygiene. Codex Alimentarius Commission. Food and Agriculture Organization/World Health Organization. Rome, Italy. ([www.codexalimentarius.org](http://www.codexalimentarius.org))

CAC/RCP 23-1979, Rev.2-1993. Code of Hygienic Practice for Low and Acidified Low Acid Canned Foods. Codex Alimentarius Commission. Food and Agriculture Organization/World Health Organization. Rome, Italy. ([www.codexalimentarius.org](http://www.codexalimentarius.org))

CAC/RCP 52-2003, Rev.6-2011, Amend.2-2013. Code of Practice for Fish and Fishery Products. Codex Alimentarius Commission. Food and Agriculture Organization/World Health Organization (FAO/WHO) Joint Programme. Rome, Italy. ([www.codexalimentarius.org](http://www.codexalimentarius.org))

CODEX STAN 90-1981. Rev.1-1995, Amend.2-2013. Codex Standard for Canned Crab Meat. Codex Alimentarius Commission. Food and Agriculture Organization/World Health Organization. Rome, Italy. ([www.codexalimentarius.org](http://www.codexalimentarius.org))

EC No. 1881/2006. Maximum levels for certain contaminants in foodstuffs. Commission Regulation. Official Journal of European Union. December 20, 2006.

DA-BFAR Fisheries Office Order No. 313, s. 2006. Amendments to the Supplemental Requirements on Quality Standards for the Exportation of Fresh, Chilled and Frozen Fish and Fishery/Aquatic Products. Bureau of Fisheries and Aquatic Resources. Department of Agriculture. Philippines. ([www.bfar.da.gov.ph](http://www.bfar.da.gov.ph))

DA-BFAR Fisheries Administrative Order No. 210, s. 2001. Rules and Regulations on the Exportation of Fresh, Chilled and Frozen Fish and Fishery/Aquatic Products. Bureau of Fisheries and Aquatic Resources. Department of Agriculture. Philippines. ([www.bfar.da.gov.ph](http://www.bfar.da.gov.ph))

DOH-BFAD Administrative Order No. 153, s. 2004. Revised Guidelines on Current Good Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food. Office of the Secretary. Department of Health. Philippines. ([www.fda.gov.ph](http://www.fda.gov.ph))

DOH-FDA Circular No. 2013-010, dated February 27, 2013. Revised Guidelines for the Assessment of Microbiological Quality of Processed Foods, Table 11. Fish and Fish Products: Fresh Frozen Fish). Food and Drug Administration. Department of Health. Alabang, Muntinlupa City, Philippines. ([www.fda.gov.ph](http://www.fda.gov.ph))

E. Edwards; J.C. Early. Torrey Advisory Note 26 (revised) Catching, Handling and Processing Crabs. Torrey Research Station. FAO Corporate Document Repository. Ministry of Technology. (<http://www.fao.org/wairdocs/tan/x5905e/x5905e00.htm>) (Accessed on May 5, 2014)

Fish and Fishery Products Hazards and Controls Guidance. Fourth Edition, April 2011. Office of Food Safety, Center for Food Safety and Applied Nutrition, Food and Drug Administration, Public Health Service, U.S. Department of Health and Human Services.

Furia, E. Handbook of Food Additives, Second Edition, Volume 1. 1972. ([http://books.google.com.ph/books?id=XcSp015g4X0C&printsec=frontcover&hl=fil&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f](http://books.google.com.ph/books?id=XcSp015g4X0C&printsec=frontcover&hl=fil&source=gbs_ge_summary_r&cad=0#v=onepage&q&f)) accessed August 15, 2014

Microbiological Guidelines for Ready-to-eat Food. Centre for Food Safety, Food and Environmental Hygiene Department. Hongkong. 2007.

Pasteurization of Crab meat (<http://rules.sos.state.ga.us/docs/40/7/4/13.pdf>; accessed August 11, 2014)

PNS/BFAD 6-2006. Thermally Processed Fish Products. Food and Drug Administration. Department of Health. Alabang, Muntinlupa City, Philippines. ([www.fda.gov.ph](http://www.fda.gov.ph))

<http://rgeagrdevcorp.com/> (accessed on June 14, 2014)

NACMF. 2004. Requisite Scientific Parameters for establishing the equivalence of alternative methods of pasteurization. National Advisory Committee on Microbiological Criteria for Foods. Washington, DC. Adopted August 27, 2004

## Annex A

Table 1 – Microbiological requirements for pasteurized crab meat

Test/Microorganism	n	c	m	M
<i>SPC/APC, cfu/g</i>	5	1	11	500
<i>Escherichia coli, MPN/g</i>	5	1	11	500
<i>Staphylococcus aureus</i> (coagulase +), cfu/g	5	0	10 <sup>3</sup>	10 <sup>4</sup>
<i>Vibrio parahaemolyticus, cfu/g</i>	10	1	10 <sup>2</sup>	10 <sup>3</sup>

## Legend:

- n -number of sample units selected from a lot of food to be examined.  
m -acceptable level of microorganism determined by a specified method; the values are generally based on levels that are achievable under GMP.  
M -level which when exceeded in one or more samples would cause the lot to be rejected as this indicates potential health hazard or imminent spoilage.  
c -maximum allowable number of defective or marginally acceptable units.

## Source:

*DOH-FDA Circular No. 2013-010, dated February 27, 2013 (Revised Guidelines for the Assessment of Microbiological Quality of Processed Foods, Table 11. Fish and Fish Products: Cooked, Chilled and Frozen Crabmeat)*

## NOTES:

- a) **Relative to the product covered by this Standard, the DOH-FDA Circular requires a test of SPC/APC only for Cooked Frozen Crabmeat, Frozen Raw Crustaceans, and Frozen Cooked Crustaceans.**
- b) **While the test for *Salmonella* is only required for Frozen Raw Crustaceans and Frozen Cooked Crustaceans.**

**Annex B****Table 3 – Acceptable levels of heavy metals in [pasteurized] crab meat**

<b>Heavy metal</b>	<b>Maximum level</b>
Cadmium	0.5 ppm <sup>1</sup>
Lead	0.5 ppm <sup>2</sup>
Total Mercury	0.5 ppm <sup>1</sup>

*Sources:*

- 1 DA-BFAR FAO No. 210, s. 2001 (*Rules and Regulations on the Exportation of Fresh, Chilled and Frozen Fish and Fishery/Aquatic Products*)
- 2 DA-BFAR Fisheries Office Order (FOO) No. 313, s. 2006 (*Amendments to the Supplemental Requirements on Quality Standards for the Exportation of Fresh, Chilled and Frozen Fish and Fishery/Aquatic Products*)

## Annex C

### **Sensory and physical examination of pasteurized crab meat**

1. Complete external can examination for the presence of container integrity defects or can ends which may be distorted outwards.
2. Open can and complete weight determination according to defined procedures in Sections 10.3.3 and 10.3.4.
3. Examine product for discoloration, foreign and objectionable matter.
4. Assess odor, flavor and texture in accordance with the *Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories* (CAC/GL 31-1999).

*Source: CODEX STAN 90-1981, Rev.1-1995, Amend.2-2013. Codex Standard for Canned Crab Meat.*

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