

PHILIPPINE NATIONAL STANDARD

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Dried Anchovies



BUREAU OF AGRICULTURE AND FISHERIES STANDARDS

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Foreword

This Philippine National Standard (PNS) for Dried Anchovies (PNS/BAFS176:2016) 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), Southeast Asian Fisheries Development Center (SEAFDEC), 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), 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.

Dried Anchovies

1 Scope

This standard shall apply to all commercial species of fish belonging to the family Engraulidae that have been dried with or without salting. This product is intended for consumption after cooking and for further processing. This Standard shall not cover products that have undergone heat treatment prior to drying.

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**breakage**

refers to fish (excluding fins and scales) which is not intact

3.2**brine**

refers to solution of salt in water

3.3**clean seawater**

refers to seawater which meets the same microbiological standards as potable water and is free from objectionable substances

3.4**contaminant**

refers to any biological or chemical agent, foreign matter or other substances not intentionally added to the food that may compromise food safety or suitability.

3.4.1**microbiological contamination**

refers to the presence, introduction, reintroduction, growth and/or survival of pathogens of public health concern

3.5**drying**

refers to a process in which the moisture content in the fish is decreased to appropriate required characteristics under controlled hygienic conditions

3.5.1**artificial drying**

refers to the process of removing moisture from fish in an enclosed chamber under controlled temperature, airflow and humidity

3.5.2

solar drying refers to drying fish using sun's energy to heat air, and then using the heated air to remove the moisture from the fish. The process involves the fish being placed in an enclosed drying chamber and allowed to dry

3.5.3

sun drying

refers to the exposure of fish to open air under the heat of the sun.

3.6

hazard

refers to a biological, chemical or physical agent in or condition of food with the potential to cause an adverse health effect

3.7

fresh fish

refers to freshly caught fish, which has received no treatment other than chilling

3.8

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.

3.9

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

3.10

lot

refers to a definitive quantity of a commodity produced essentially under the same conditions

3.11

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.

3.12

potable water

refers to water suitable (both health and acceptability considerations) for drinking and cooking purposes

3.13

salting

refers to a process of treating fish with food grade quality salt to lower water activity in fish flesh and to enhance flavor by any appropriate salting technology (e.g. dry salting and brining)

3.13.1

brining

refers to the process of placing fish in brine for a period of sufficient length for the fish tissue to absorb a specific quantity of salt

3.14

shelf-life

refers to the period during which the product maintains its microbiological and chemical safety and sensory qualities at a specific storage temperature. It is based on identified hazards for the product, heat or other preservation treatments, packaging method and other hurdles or inhibiting factors that may be used

3.15

split dried anchovies

refer to dried anchovies prepared by cutting the fish from the base of the tail to the tip of the head with internal organs and gills removed, and with or without backbone or head prior to salting and drying

3.16

water activity (a_w)

refers to a measure of the free moisture in food which supports the growth of microorganisms. It is the quotient of the water vapor pressure of the substance divided by the vapor pressure of pure water at the same temperature

3.17

whole dried anchovies

refer to dried anchovies in their original form, which have not been cut, and may or may not have been eviscerated, and with all parts intact.

4 Description

4.1 Product description

The product shall be prepared from fresh fish of the family *Engraulidae* with some of the species listed, but not limited to in Annex A, and presented in the following forms:

- a) whole dried anchovies; and
- b) split dried anchovies.

4.2 Process description

Fresh anchovies shall be washed with clean seawater or potable water with or without salt, and followed by the processing steps:

- a) For Whole Dried Anchovies, the fish is soaked in brine, if necessary, and then dried;
- b) For Split Dried Anchovies, deboned with or without backbone or head, soaked in brine if necessary, and then dried.

The drying process shall mean sun drying, solar drying or artificial drying. The resulting dried products are cooled and packed in appropriate packaging materials.

5. Essential composition and quality factors

5.1 Raw material

5.1.1 Fish

Only fresh anchovies shall be used.

5.1.2 Salt (for preparation of brine)

Salt shall be of food grade quality and meets the purity requirements of standards for iodized salt as per R.A. No. 8172 *An Act Promoting Salt Iodization Nationwide and for Related Purposes* and suitable quality as specified in sub-section 5.4.2 of the "Recommended International Code of Practice for Salted Fish" (CAC/CRP 26-1979), and their future amendments.

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 and comply with the provisions set out in Section 11. Products shall be examined by the methods given in Section 10.

5.2.2 The product shall comply with the physico-chemical requirements prescribed in Table 1.

Table 1 – Physico-chemical requirements of dried anchovies

Characteristics	Requirement
Sodium chloride, max (dry basis)	15%
Water activity at 25 ⁰ C (a _w), max	0.70
Acid insoluble ash , max. (dry basis)	1.5 %
Histamine, max ppm	200

Source: CODEX STAN 236-2003: Codex Standard for Boiled Dried Salted Anchovies.

5.2.3 Product Sizing

The product shall comply with the size classifications of dried anchovies prescribed in Table 2.

Table 2 – Size classification of dried anchovies

Size designation	Total length (cm)
Small	2.5-3.5
Medium	3.5 – 6.5
Large	greater than 6.5

5.2.4 Product Grading

Each size of dried anchovies shall be classified into two grades as prescribed in Table 3. Those which are not included in Grade A and B will be considered reject.

Table 3 – Grades of dried anchovies

Characteristics	Grade	
	A	B
Individual breakage	Less than 5%	more than 5 % but less than 15%
Color (comparison of color must be among the same species of fish)	Whitish or bluish or yellowish (characteristic of species)	Off white or pale yellow
Odor	No foul or rancid smell	No foul or rancid smell

Source: CODEX STAN 236-2003: Codex Standard for Boiled Dried Salted Anchovies

5.2.5 The products should comply with any microbiological requirement criteria specified in Table 4.

Table 4 – Microbiological criteria for dried anchovies

Test/Microorganism	N	c	m	M
Aerobic plate count (APC), cfu/g	5	2	10 ⁵	5x10 ⁵
Yeast and mold count, cfu/g	5	2	10 ³	10 ⁴
<i>Staphylococcus aureus</i> , cfu/g	5	2	10 ³	10 ³
Total coliform	5	2	10	100

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: PNS/BFAD 04-2006: Ethnic Food Products- Dried, Salted Fish-Specification.

6 Food additives

Food additives shall be in accordance with the Codex General Guidelines for Food Additives (Codex Stan 192-1995) and the current FDA regulations and may include the following: sorbic acid or its calcium, sodium or potassium salts maybe used as preservative at the maximum level of 200 mg/kg of the final product, singly or in combination, expressed as sorbic acid.

7 Contaminants

The product shall not contain any other substance in amounts which may present a hazard to health. The products shall comply with the maximum level of contaminants as specified in Annex B.

8 Hygiene and handling

8.1 The products shall be prepared and processed 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, the Recommended Code of Practice for Processing and Handling of Dried Fish (PNS/BFAD 5-2006) 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).

8.2 Fresh anchovies are recommended to be processed immediately after harvesting or maintained at not more than 4⁰C under hygienic conditions during transportation and storage, and until the time of processing.

9 Packaging and labeling

9.1 Packaging

The products shall be packed in retail and/or bulk packaging materials which shall contain only one species per pack.

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 “dried anchovies”. The word “salted” (if the product is with added salt) or “unsalted” (if the product is without added salt) shall be indicated. The products may be called by other common/local names provided that such names are accepted in the place/country of distribution and in a manner not to mislead the consumer (e.g. dried *dilis* or dried *bolinao*);
- b) The scientific names of the fish may appear on the label but shall be declared on trade documents;
- c) The net content by weight in metric system. The net weight based on other systems of measurement required by importing countries shall appear in parenthesis after the metric net weight;

- d) The label shall state that the product must be stored under suitable conditions to maintain the best quality during transport, storage and distribution (e.g. keep in cool dry place);
- e) The words “Expiration Date” followed by the date (DD/MM/YYYY) indicating end of the period at which the product shall retain its optimum quality attributes at a stated storage condition;
- f) The name and address of either of the following: manufacturer, packer, distributor, importer, exporter or vendor;
- g) The lot identification code/number;
- h) The words “Product of the Philippines” or the country of origin if imported; and
- i) 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 (Section 9.2.1) 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 Codex General Guidelines on Sampling (CAC/GL 50-2004). A sample unit is the individually packed product or a 1kg portion from bulk containers.

10.2 Method of sensory and physical examinations

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

10.3 Method of analysis

10.3.1 Determination of acid insoluble ash

According to the AOAC Official Method 975.12 or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

10.3.2 Determination of sodium chloride (NaCl)

According to the AOAC Official Method 937.09 (the latest edition) Volhard Method or other validated methods that provide equivalent sensitivity, reproducibility and reliability. Chloride expressed as sodium chloride.

10.3.3 Determination of histamine

According to the Fluorometric Method, AOAC (the latest edition) Method or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

10.3.4 Determination of water activity

According to the AOAC (the latest edition) Method or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

10.3.5 Determination of microorganisms in Table 4

According to the procedure described by FDA Bacteriological Analytical Manual published by AOAC (the latest edition) or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

10.3.6 Determination of net weight

According to the procedure described in Annex D– *Determination of Net Weight*.

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

The presence in the sample unit of any matter which has not been derived from the anchovies (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 Breakage

Textural breakdown characterized by the body parts being broken or torn into two or more pieces in more than 15% of the sample unit.

11.4 Discoloration

Excessive discoloration not characteristic of the final product

11.5 Mold and fungal growth

Presence of visible mold and fungal growth

12 Lot 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 weight, provided no individual container is less than 95% of the declared weight; and
- c) the essential composition and quality factors, contaminants, hygiene and handling, and packaging 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 52-2003, Rev.6-2011, Amend.2-2013. Code of Practice for Fish and Fishery Products. Commission. Food and Agriculture Organization/World Health Organization (FAO/WHO) Joint Programme. Rome, Italy. (www.codexalimentarius.org)

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PNS/BAFS 139-2013. Philippine National Standard for Fresh and Frozen Cephalopods. Bureau of Agriculture and Fisheries Standards. Department of Agriculture. Philippines. (www.bafps.da.gov.ph)

PNS/BFAD 04-2006. Philippine National Standard for Dried, Salted Fish. Food and Drug Administration (formerly Bureau of Food and Drug). Department of Health. Philippines. (www.fda.gov.ph)

PNS/BFAD 05-2006. Philippine National Standard on the Recommended Code of Practice for the Processing and Handling of Dried Fish. Food and Drug Administration (formerly Bureau of Food and Drug). Department of Health. Philippines. (www.fda.gov.ph)

Food Drying Science and Technology: Microbiology, Chemistry, Application. 2008. DEstech Publication, Inc. 1148 Elizabeth Avenue #2, Lancaster, Pennsylvania 170611 USA

Annex A

Table 2 – Anchovies species in the Philippines

English/Common name	Local name	Scientific name
1. Shorthead anchovy	<i>Bolinao na itim</i>	<i>Encrasicholina heteroloba</i>
2. Buccaneer anchovy	<i>Dilis</i>	<i>Encrasicholina punctifer</i>
3. Japanese anchovy	<i>Dilis</i>	<i>Engraulisjaponicus</i>
4. Scaly hairfin anchovy	<i>Dilis</i>	<i>Setipinna taty</i>
5. Common hairfin anchovy	<i>Dilis</i>	<i>Setipinna tenuifilis</i>
6. Commerson's anchovy	<i>Dilis</i>	<i>Stolephorus commersonii</i>
7. Indian anchovy	<i>Dilis</i>	<i>Stolephorus indicus</i>
8. Spotty-face anchovy	<i>Dilis</i>	<i>Stolephorus waitei</i>
9. Baelama anchovy	<i>Dilis</i>	<i>Thryssa baelama</i>
10. False baelama anchovy	<i>Dilis</i>	<i>Thryssa encrasicholoides</i>
11. Hamilton's thryssa	<i>Dilis</i>	<i>Thryssa hamiltonii</i>
12. Longjaw thryssa	<i>Dilis</i>	<i>Thryssa setirostris</i>
13. Ronquillio's anchovy	<i>Dilis</i>	<i>Stolephorusronquilloi</i>

Source:

Commercially Important Fishes Occurring in the Philippines (www.fishbase.org, accessed on April 29, 2014)

Annex B

Table 5 – Acceptable levels of heavy metals in fish

Heavy metal	Maximum level (ppm)
Cadmium	0.5 ¹
Lead	0.3 ^{2, 3}
TotalMercury	0.5 ¹

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)*
- 3 *CODEX STAN 193-1995 (Codex General Standard for Contaminants and Toxins in Food and Feed)*

Annex C

Sensory and Physical Examination

The sample used for sensory evaluation should not be same as that used for other examination.

1. Examine every fish in the sample unit for foreign matter, breakage, pink condition and mould growth.
2. Assess the odor in uncooked sample in accordance with the Guidelines for the Sensory Evaluation of Fish and Shellfish In Laboratories (CAC/GL 31-1999).
3. Assess the flavor in cooked sample in accordance with the Guidelines for the Sensory Evaluation of Fish and Shellfish In Laboratories (CAC/GL 31-1999).

The sample shall be cooked prior to assessment according to the cooking instructions on the package. When such instructions are not given, the sample shall be deep fried in fresh cooking oil at 190⁰C for 1-2 minutes as appropriate to the size.

Source:

CODEX STAN 236-2003: Codex Standard for Boiled Dried Salted Anchovies

Annex D**Determination of Net Weight****1 Apparatus**

Weighing balance (sensitivity: 0.10 gram)

2 Procedure

- 2.1** Weigh the sample unit on its original sample packed container. This is the gross weight.
- 2.2** Open and pour out the contents of each individual package. Wash the empty package and blot dry.
- 2.3** Weigh out the washed empty package. This is the weight of the packaging material.
- 2.4** Subtract the weight of the empty package from the gross weight. The resulting figure is the net weight of the individual package (net weight = gross weight – weight of packaging).
- 2.5** Average the results from all package of a sample representing a lot. Report result as the average net weight of the product.

Source:

CODEX STAN 236-2003: Codex Standard for Boiled Dried Salted Anchovies

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