

PHILIPPINE NATIONAL STANDARD

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Live, chilled/frozen abalone



DEPARTMENT OF
AGRICULTURE
PHILIPPINES

BUREAU OF AGRICULTURE AND FISHERIES PRODUCTSTANDARDS

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines

T/ (632) 920.6131 / 455.2856 / 467.9039

TF/ (632) 455.2858

E-mail: bafps@yahoo.com

Website: www.bafps.da.gov.ph

Foreword

The request for the development of a standard for live, chilled/frozen abalone was initiated by the National Agricultural and Fisheries Council (NAFC) Committee on Fisheries and Aquaculture (CFA) which was tasked to select priority products for standardization based on identified criteria. The criteria were based on consumer and public health concerns, volume of production and consumption, as well as the volume and value of exports. The development of this standard is likewise consistent with the Medium Term Development Plan of the Departments of Agriculture and Health, respectively.

A Technical Working Group (TWG) was created, composed of members representing the Bureau of Fisheries and Aquatic Resources (BFAR), Southeast Asia Fisheries Development Center Aquaculture Department (SEAFDEC AQD) and the Philippine Council for Aquatic and Marine Research and Development (PCAMRD) with the Bureau of Agriculture and Fisheries Product Standards (BAFPS) as Secretariat. The TWG formulated the draft standard and conducted public consultations in Puerto Princesa City (Region 4-B), Tacloban City (Region 8) and Cebu City (Region 7) in collaboration with the respective Regional Field Units of the Department of Agriculture. Among the participants during the public consultations were representatives of abalone growers, traders, processors, academe, local government units and consumer groups. This final draft is composite of the recommendations made by the TWG and the relevant stakeholders who participated in the three (3) public consultations.

This Philippine National Standard for live, chilled/frozen abalone identifies the Philippine species of abalone, specifies their essential composition and quality factors (including size classification and quality characteristics), provides the presentation, packaging and labeling requirements, indicates the methods sampling, examination and analyses, and defines the types of defectives. It is hoped that this standard accomplishes our two-pronged goal of protecting consumer health and making the Philippine fish and fishery products globally competitive.

1 Scope

This standard applies to the preparation of live, chilled/frozen abalone of the family Haliotidae and the Philippine species of abalone like *Haliotis asinina* and other tropical abalone species. Raw fresh chilled or frozen abalone may be whole or with the viscera and mucous removed. Chilling or freezing is done in such a way that essentially, the freshness characteristics of live abalone are retained. Both live and raw abalone may be intended for direct consumption or further processing.

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 the standard, the following terms shall mean:

3.1

abalone

a single-shelled herbivorous marine gastropod mollusk having a soft body surrounded by a mantle, an anterior head and muscular foot. They are members of the family Haliotidae and genus *Haliotis*.

3.2

chilling

the process of cooling fish and shellfish to a temperature approaching that of melting ice.

3.3

cleaning

the removal of soil, food residues, dirt, grease or other objectionable matter.

3.4

clean water

water from any source where harmful microbiological contamination, substances and/or toxic plankton are not present in such quantities which may affect the health quality of fish, shellfish and their products.

3.5

clean seawater

estuarine or marine waters which are free from pollution and toxic marine algae in amounts which will adversely affect the quality and/or safety of fish.

3.6

container

any packaging of food for delivery as a single item, whether by completely or partially enclosing the food and includes wrappers. A container may enclose several units or types of packages when such is offered to the consumer.

3.7

contaminant

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

3.8

food additives

those substances considered by the CODEX STAN 192-1995, General Standard for Food Additives under the category 9.2.1 (frozen fish, fish fillets, and fish products, including mollusks, crustaceans, and echinoderms).

3.9

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

3.10

freezing

a process which is carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperatures has reached -18°C (0°F) or lower at the thermal centre after thermal stabilization.

3.11

glazing

the application of a protective layer of ice formed at the surface of a frozen product, done by spraying with or dipping it into clean seawater, potable water, or potable water with approved additives, as appropriate.

3.12

good manufacturing practices (GMP)

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

3.13

hazard

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

**3.14
ingredient**

any substance including food additive, used in the manufacture or preparation of a food and present in the final product although possibly in a modified form.

**3.15
label**

includes any tag, brand, mark, pictorial, or other descriptive matter, written, printed, stenciled, marked, embossed or impressed on, or attached to, a container.

**3.16
lot**

the quantity of food products under essentially the same condition during a particular production schedule.

**3.17
packaging**

the process of packing bulk products to obtain the finished product. It is any material/printed material used in the packaging of a product, including any outer packaging used during transport or shipment. Packaging materials are classified as primary or secondary, depending on whether they are intended to be in direct contact with the product or not.

**3.18
potable water**

freshwater fit for human consumption. Standards of potability should not be lower than those contained in the latest edition of the International Standards for Drinking Water, of the World Health Organization (WHO).

**3.19
retail**

an operation that stores, prepares, packs, serves, or otherwise provides fish, shellfish and their products directly to the consumer, who prepares them for human consumption. This may be free standing seafood markets, seafood sections in groceries or department stores. Products sold may be packaged chilled or frozen and/or full service.

4 Description

4.1 Product definition

4.1.1 Live abalone

Abalone, cultured or wild-caught, which are free from any defects, and causes no harm and risk to public health.

4.1.2 Chilled abalone

Shelled or blanched abalone meat, which are properly handled and chilled to keep the product fresh through wet ice (icing), chilled seawater (CSW) or ice slurry, refrigerated air, dry ice, or gel ice mat.

4.1.3 Frozen abalone

Shelled or blanched abalone meat, which are subjected to proper chilling temperature, hygienically handled and frozen to reduce its temperature to -18°C (0°F) in order to preserve and maintain its quality.

4.2 Process definition

4.2.1 Live abalone

Harvested abalone which are of good quality, washed with clean seawater, and graded to size according to good hygienic practices.

4.2.2 Chilled abalone

Shelled or blanched abalone meat, cleaned with potable water and cooled to a temperature of melting ice (0°C/32°F).

4.2.3 Frozen abalone

Shelled or blanched abalone meat, washed in potable water, chilled, handled, and subjected to a freezing process sufficient to reduce the temperature to -18°C (0°F), packed using food grade packaging material, and stored (-18°C to -20°C) to preserve and maintain its quality.

5 Essential composition and quality factors

5.1 Abalone

Live, chilled/frozen abalone shall be prepared from good quality raw material of *Haliotis asinina* and other tropical abalone species.

5.2 Glazing

The water to be used for glazing solutions shall be potable.

5.3 Other ingredients

5.3.1 Water

The water to be used as medium for the cooling process shall be clean and potable.

5.4 Final product

5.4.1 The final product shall meet all the requirements of the standards as specified in the sampling plan (AQL=6.5) (Codex STAN 233-1969).

5.4.2 The final product shall possess the following size classification:

Table 1 – Size classification of abalone

A. Shelled

Size	Shell Length (cm)	Individual Body Weight g (pc/kg)
Small	5.5-6.0	50-60 (17-20)
Medium	6.1-6.5	61-70 (14-16)
Large	6.6-7.0	71-80 (11-13)
Extra Large	7.1 and above	81 and above (5-10)

B. Fresh meat

Size	Meat Length (cm)	Individual Body Weight g (pc/kg)
Small	7.5 . 7.9	47-51 (20-21)
Medium	8.0 . 8.4	52-60 (17-19)
Large	8.5 . 8.9	61-68 (15-16)
Extra Large	9.0 and above	69 and above (14 and below)

5.4.3 The final product shall exhibit the following quality characteristics:

Table 2 – Quality characteristics of abalone

A. Live

<p>A. Appearance</p> <ul style="list-style-type: none"> - shell and meat firmly attached - greenish shell with grayish and slimy meat - clear mucous
<p>B. Odor</p> <ul style="list-style-type: none"> - characteristic odor of the abalone species

B. Chilled/frozen fresh meat (shelled or deshelled)

<p>A. Appearance</p> <ul style="list-style-type: none"> - intact and creamy meat - absence of abnormalities or dark spots on the surface
<p>B. Odor/flavor</p> <ul style="list-style-type: none"> - characteristic odor of the abalone species - sweet flavor
<p>C. Texture</p> <ul style="list-style-type: none"> - firm

5.4.4 The final product shall conform to the following microbiological characteristics:

Table 3 – Microbiological characteristics

Microbiological parameter	Limit
1. Aerobic Plate Count (APC)	500,000 /g
2. <i>Escherichia coli</i>	11/g
3. <i>Salmonella</i>	Absent in 25 g
4. <i>Shigella</i>	Absent
5. <i>Staphylococcus aureus</i>	1,000 /g
6. <i>Vibrio Cholera</i>	Absent

6. Food additives

Food additives are not permitted in live abalone. However, for frozen mollusk the use of additives is permitted based on the General Standards for Food Additives (Codex STAN 192-1995) provisions for Food Category 09.2.1 (frozen fish, fish fillets, and fish products, including mollusks, crustaceans, and echinoderms).

7 Hygiene and handling

7.1 The final product shall be free from any foreign material and contaminants that poses a threat to human health.

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

- (i) Shall be free from microorganisms or substances originating from microorganisms in amounts which pose hazards to human health in accordance with standards established by the Codex Alimentarius Commission;
- (ii) Shall not contain any other substance in amounts which pose a hazard to health in accordance with standards established by the Codex Alimentarius Commission; and
- (iii) Shall conform to the sampling methods/techniques and to the microbiological requirements of International Commission on Microbiological Specifications for Foods (ICMSF).

7.3 The abalone products covered by the provisions of this standard shall 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. 3-1997) and the following relevant Codes:

- (i) The Recommended International Code of Practice for Processing and Handling Quick Frozen Foods (CAC/RCP 8-1976);

- (ii) The Recommended International Code of Practice for Frozen Fish (CAC/RCP 16-1978);
- (iii) Recommended International Code of Hygienic Practice for Molluscan Shellfish (CAC/RCP 18-1978); and
- (iv) The Recommended International Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003, Rev. 2-2005).

8 Presenattion, packaging and labeling

8.1 Presentation

8.1.1 The products shall be presented as live, chilled/frozen abalone, either meat or with shell.

8.1.2 The individual retail or bulk container shall contain only one species of abalone, which must be relatively uniform in size.

8.2 Packaging

The product shall be packed in food grade packaging materials either vacuum packed or ordinary polyethylene (PE) bags made of suitable film or laminates, which are clean and free from any foreign matter or contaminant.

8.3 Labeling

In addition to the provisions of the Codex General Standard for the Labeling of Prepackaged Foods (CODEX STAN 1-1985, Rev. 1, 1991) the following specific provisions apply:

8.3.1 Labeling of retail package/container

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

- (i) The name of the product. The word ~~%live,~~ ~~%chilled,~~ and ~~%frozen,~~ shall be followed by the common or usual name of the product or species;
- (ii) The mark/label plastic pouches shall indicate the prescribed sizes (S, M, L and XL) and batch number;
- (iii) The label shall state that the product must be stored under conditions to maintain the best quality during transport, storage and distribution;
- (iv) 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;

- (v) The label shall indicate the phrase "Product of the Philippines";
- (vi) The name and address of manufacturer/packer/distributor or source of origin;
- (vii) Net weight or number of pieces; and
- (viii) Lot number.

For live or chilled retail products, all of the above shall apply except provision (iv).

8.3.2 Labeling of non-retail container

Information specified above shall be printed either on the container or in accompanying documents, except that the name of the food, lot identification, name and address of the manufacturer or packer as well as storage instructions, shall always appear on the container. However, the lot identification and the name and address may be replaced by an identification mark (i.e. bar code), provided that such mark is clearly identified with accompanying documents.

9 Methods of sampling, examination and analyses

9.1 Methods of sampling

9.1.1 Each sample shall contain a sufficient number of abalone to ensure that the sample is representative of the lot.

9.1.2 The portion of the abalone analyzed should be the edible part. This is generally the whole tissue.

9.1.3 Sampling of lots for examination of the product shall be in accordance with the Codex General Guidelines on Sampling (CAC/GL 50-2004).

9.2 Sample preparation

9.2.1 Procedures for thawing

For frozen product, the sample unit is thawed by enclosing it in a film-type bag and immersing in water at room temperature (not greater than 35°C). The complete thawing of the product is determined by gently squeezing the bag occasionally so as not to damage the texture of the abalone or until no hard core or ice crystals are left.

9.3 Method of sensory and physical examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination, using procedures elaborated in section 8.4, and *Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories (CAC/GL 31-1999)*.

9.4 Methods of analyses

9.4.1 Determination of count per unit weight or volume

When declared on the label, the count per unit weight or volume of abalone shall be determined by counting the number of abalone in the container or a representative sample thereof, and dividing the count of abalone by the actual weight/volume.

9.4.2 Determination of net weight (for frozen abalone product)

The net weight of all sample units shall be determined by the procedures described or mentioned in Sections 9.4.2.1 to 9.4.2.3.

9.4.2.1 Determination of net weight of product exclusive of packaging

- (i) Weigh the unopened container;
- (ii) Open the container and remove the contents;
- (iii) Dry the empty container and weigh; and
- (iv) Subtract the weight of the empty container from the weight of the unopened container.

The resultant figure will be the total net weight.

9.4.2.2 Determination of net weight of frozen products not covered by glaze

The net weight (exclusive of packaging material) of each sample unit representing a lot shall be determined in the frozen state.

9.4.2.3 Determination of net weight of frozen products covered by glaze

The net weight (exclusive of packaging material) of each sample unit representing a lot shall be determined using the Association of Official Analytical Chemists (AOAC) official method 963.18 (Net Contents of Frozen Seafoods).

9.4.3 Determination of aerobic plate count

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

9.4.4 Determination of *Escherichia coli* in abalone

The ISO/TS 16649-3 . Horizontal method for the enumeration of beta glucuronidase-positive *Escherichia coli* . Part 3: Most probable number technique using 5-bromo-4-chloro-3-indolyl-beta-D-glucuronide or other validated methods in accordance with the protocol set out in the ISO 16140 or other internationally accepted similar protocol.

9.4.5 Determination of *Salmonella* in abalone

The methods to be employed for *Salmonella* should be ISO 6579, or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

9.4.6 Determination of *Shigella spp.*

According to the procedure described by USFDA's Bacteriological Analytical Manual (BAM), published by AOAC, 1998, 8th Edition.

9.4.7 Determination of *Staphylococcus aureus*

According to the procedure described by USFDA's Bacteriological Analytical Manual (BAM), published by AOAC, 2001, 12th Edition.

9.4.8 Determination of *Vibrio cholerae*

According to the procedure described by USFDA's Bacteriological Analytical Manual (BAM), published by AOAC, 1998, 8th Edition.

10 Definition of defectives

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

10.1 Dead or damaged product

Dead abalone is characterized by lack of muscle movement when touched and/or complete muscle stiffness due to the rigor mortis process setting in after death of the animal. Abalone which are damaged to the extent that they can no longer function biologically are considered to be defective. The product is rejected if more than 5% of the units in the sample are dead or damaged.

10.2 Deep dehydration

Deep dehydration is manifested when greater than 10% of the surface area of the sample unit of frozen abalone products exhibits excessive loss of moisture, clearly shown as white or yellow abnormality on the surface. This abnormality masks the color of the flesh and penetrates below the surface and cannot be easily removed (by scraping with a knife or other sharp instruments) without unduly affecting the appearance of the abalone product.

10.3 Foreign matter

Foreign matter is any matter/object present in the sample unit which is not derived from any abalone product (excluding packing material) which is readily recognized even without magnification. It may be present at a level determined by any method including magnification indicating non-compliance with good manufacturing and sanitation practices, but does not pose any threat to human health.

10.4 Objectionable odor/flavor

Sample unit of any abalone product is affected by persistent and distinct objectionable odor or flavor indicative of decomposition (ammoniacal, putrid, rancid, sour, etc.)

10.5 Discoloration

Any alteration in flesh/meat in the sample unit of chilled/frozen abalone such as fading in color, an indication of spoilage or dehydration due to prolonged storage.

10.6 Unacceptable texture

Textural breakdown of the flesh/meat in the sample unit of chilled/frozen abalone indicative of decomposition, characterized by a gummy or rubbery muscle.

11. Lot acceptance

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

- (i) the total number of defectives as classified according to Section 10 does not exceed the acceptance number (c) of the appropriate sampling plan in the General Guidelines on Sampling (CAC/GL 50-2004);
- (ii) the total number of sample units not meeting the count designation as defined in Section 9.4.1 does not exceed the acceptance number (c) of the appropriate sampling plan in the General Guidelines on Sampling (CAC/GL 50-2004);
- (iii) the average net weight of all sample units is not less than the declared weight, provided there is no unreasonable shortage in any individual container; and
- (iv) the Food Additives, Hygiene and Labeling Requirements of Sections 6, 7 and 8.3 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.

- DA BFAR, 2001. Fisheries Administrative Order No. 210. Rules and Regulations on the Exportation of Fresh, Chilled and Frozen Fish and Fishery/Aquatic Products. Diliman, Quezon City. Department of Agriculture, Bureau of Fisheries and Aquatic Resources.
- DOH BFAD, 1993. Administrative Order No. 18-A. Standards of Quality and Requirements for the Processing, Packaging and Labeling of Bottled Drinking Water. Muntinlupa City, Philippines, Department of Health, Bureau of Food and Drugs.
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- DOH OSEC. Administrative Order No. 153 s. 2004. Revised Guidelines on Current Good Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food. Sta. Cruz, Manila, Philippines, Department of Health, Office of the Secretary.
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- USFDA CFSAN Bacteriological Analytical Manual (BAM) Online, January 2001. www.cfsan.fda.gov.

**Department of Agriculture
Bureau of Agriculture and Fisheries Product Standards
Technical Working Group (TWG) for the Development of
Philippine National Standard (PNS) for Abalone**

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Bureau of Agriculture and Fisheries
Product Standards
Department of Agriculture



BUREAU OF AGRICULTURE AND FISHERIES PRODUCT STANDARDS

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines

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