

PHILIPPINE NATIONAL STANDARD

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Live and Raw Bivalve Molluscs



BUREAU OF AGRICULTURE AND FISHERIES PRODUCT STANDARDS
BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines
Phone (632) 920-6131; (632) 455-2856; (632) 467-9039; Telefax (632) 455-2858
E-mail: bafpsda@yahoo.com.ph

Foreword

The Philippine National Standard (PNS) for Live and Raw Bivalve Molluscs was adopted from the existing international Codex Standard for Live and Raw Bivalve Molluscs (CODEX STAN 292-2008).

To tailor fit the standard to the Philippines requirements, modifications were made in the format and definition of terms. An electronic solicitation of comments and a stakeholders consultative meeting were conducted by the Bureau of Agriculture and Fisheries Product Standards (BAFPS) in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR) on February-March, 2010 and July 28, 2010 (Quezon City), respectively. Subsequently, relevant and substantial comments solicited from concerned and competent agencies, and industry-stakeholders were also incorporated in the PNS.

The PNS for Live and Raw Bivalve Molluscs aims to provide a common understanding on the scope of the standard, product description, essential composition and quality factors, food additives, contaminants, hygiene and handling, labelling requirements, methods of sampling, examination and analyses, definition of defectives, and the requirements for product lot acceptance.

Live and raw bivalve molluscs

1 Scope

This standard applies to live bivalve molluscs and to raw bivalve molluscs that have been shucked and/or frozen, and/or processed to reduce or limit target organisms while essentially retaining the sensory characteristics of live bivalve molluscs. Raw bivalve molluscs are marketed either in a frozen or chilled state. Both live and raw bivalve molluscs may be intended for direct consumption or further processing. The standard does not apply to scallops when the final product is the adductor muscle only.

Part I below applies to live bivalve molluscs while Part II applies to raw bivalve molluscs.

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 this standard, the following terms shall mean:

3.1**biotoxins**

poisonous substances naturally present in fish and fishery products or accumulated by the animals feeding on toxin producing algae, or in water containing toxins produced by such organisms

3.2**bivalve molluscs**

a group of soft-bodied organisms that live enclosed in two shells, and have a muscular foot and siphons (e.g. mussels, clams, oysters, scallop)

3.3**contaminant**

any substance not intentionally added to food, which is present in such food as a result of the production (including operations carried out in crop husbandry, animal husbandry and veterinary medicine), manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food or as a result of environmental contamination. The term does not include insect fragments, rodent hairs and other extraneous matter

3.4**depuration**

the reduction of microorganisms to a level acceptable for direct consumption by the process of holding live bivalve molluscs for a period of time under approved, controlled conditions in natural or artificial sea water suitable for the process, which may be treated or untreated

3.5**food additives**

any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which

to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result (directly or indirectly), in it or its by-products becoming a component of or otherwise affecting the characteristics of such foods. The term does not include contaminants or substances added to food for maintaining or improving nutritional qualities

3.6

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

3.7

ingredient

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

3.8

label

any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food

3.9

lot

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

3.10

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

Part I – Live Bivalve Molluscs

I-4 Description

I-4.1 Product definition

Live bivalve molluscs are products that are alive immediately prior to consumption. Presentation includes the shell.

I-4.2 Process definition

Live bivalve molluscs are harvested alive from a harvesting area either approved for direct human consumption or classified to permit harvesting for an approved method of purification, e.g. relaying or depuration, prior to human consumption. Both relaying and depuration must be subject to appropriate controls implemented by the official agency having jurisdiction.

I-4.3 Presentation

Any presentation of the product shall be permitted provided that it:

- (i) meets all requirements of this standard; and
- (ii) is adequately described on the label to avoid confusing or misleading the consumer.

The bivalve molluscs may be packed by weight, count, count per unit of weight, volume or per package.

I-5 Essential composition and quality factors

I-5.1 Bivalve molluscs

Live bivalve molluscs should possess organoleptic characteristics associated with freshness, as well as an adequate response to percussion (i.e. the shellfish will close by themselves when tapped) and freedom from extraneous matter, as determined by specialists familiar with the species concerned.

I-5.2 Final product

Live bivalve molluscs shall meet the requirements of this standard when lots examined in accordance with Section I-12 comply with the provisions set out in Section I-11. Live bivalve molluscs shall be examined by the methods given in Section I-10.

I-6 Food additives

Food additives are not permitted in live bivalve molluscs.

I-7 Contaminants

I-7.1 The products covered by this Standard shall comply with the Maximum Levels of the Codex General Standard for Contamination and Toxins in Foods (CODEX/STAN 193-1995, Rev. 4-2009, Amend. 2-2010) and the maximum residue limits for pesticides and/or veterinary drugs established by the CAC.

I-7.2 The following provisions apply to the edible parts of live bivalve mollusc (the whole part or any part intended to be eaten separately):

Name of biotoxin groups	Maximum level /kg of mollusc flesh
Saxitoxin (STX) group	0.6 milligrams (2HCL) of saxitoxin equivalent
Okadaic acid (OA) group	0.16 milligrams of okadaic equivalent
Domoic acid (DA) group	20 milligrams domoic acid

I-8 Hygiene and handling

I-8.1 Products covered by this standard must be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice ó General Principles of Food Hygiene (CAC/RCP 1 ó 1969, Rev.4-2003), the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003, Rev.5-2010) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

I-8.2 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

I-8.3 Growing area monitoring programs, irrespective of the type of indicator bacteria used, must ensure that live bivalve molluscs destined for direct human consumption meet the *E. coli* limit as identified below when tested in accordance with an MPN method specified in ISO 16649-3 or equivalent.

I-8.4 In analysis involving five (5) 100g samples of the edible parts (the whole part or any part intended to be eaten separately), none may contain more than 700 *E. coli* and not more than one (1) of five (5) samples may contain between 230 and 700 *E. coli*, or equivalent as decided by the competent authority having jurisdiction

Microorganism = *Escherichia coli* n=5 c=1 m=230 M=700 3 Class Plan

where n= the number of sample units, c= the number of sample units that may exceed the limit m and M is the limit which no sample unit may exceed.

I-8.5 In analysis involving five (5) 25g samples of the edible parts (the whole part or any part intended to be eaten separately), no sample may indicate the presence of *Salmonella* when tested using a method validated against the reference method ISO 6579.

Microorganism = *Salmonella* n=5 c=0 m=0/25g 2 Class Plan

where n = number of samples that must conform to the criteria; c = the maximum allowable number of defective sample units; m = a microbiological limit which separates good quality from defective quality.

I-8.6 Where the microbiological criteria are not met, actions should be taken as deemed appropriate by the competent authority. In following up, consideration should be given to detention, recall and further processing in a manner to eliminate the hazard from implicated lots. In addition, assessment of the status of harvesting areas and/or establishment controls should be undertaken.

I-9 Labelling

In addition to the provisions of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Amend. 7-2010) the following specific provisions apply:

I-9.1 Name of the product

The name of the product to be declared on the label shall be the common or usual name of the species of bivalve molluscs in accordance with the law and custom of the country in which the food is sold and in a manner not to mislead the consumer.

I-9.1.1 There shall appear on the label, reference to the presentation provided for in Section I-4.3- Presentation in close proximity to the name of the product in such descriptive terms that will adequately and fully describe the nature of the presentation of the product to avoid misleading or confusing the consumer.

I-9.1.2 In addition to the specified labelling designations above, the usual or common trade names of the variety may be added so long as it is not misleading to the consumer in the country in which the product will be distributed.

I-9.2 Content declaration

Live bivalve molluscs shall be labelled by weight, count, count per unit weight, or volume as appropriate to the product.

I-9.3 Storage instructions

The label shall specify the conditions for storage and/or temperature that will maintain the product safety/viability during transportation, storage and distribution.

I-9.4 Labelling of non-retail containers

Labelling for live bivalve molluscs shall contain the following information:

- (i) Identification of the product by common and/or scientific names as determined by the competent authority. The country where the product is sold can determine if the scientific name must be indicated on the label.
- (ii) Information that might be needed in the event of a food safety problem, including lot identification which could be lot code or date and location of harvest, information about harvest area, date of harvesting, purification or relaying as appropriate, as well as identification of the despatch centre or other establishment from which they were shipped.
- (iii) Shelf life.

Date of minimum shelf life may be replaced by the statement "Bivalves must be alive when sold".

I.9.5 The label shall indicate the name "Product of the Philippines".

I-10 Sampling, examination and analyses

I-10.1 Sampling

- (i) Each sample shall contain a sufficient number of bivalve molluscs to ensure that the sample is representative.
- (ii) The portion of the bivalve mollusc analysed should be the edible part. This is generally the whole tissue.

Where whole-tissue analysis is not possible or practical, the most contaminated tissue (e.g. the digestive gland) may be dissected and analysed and the results converted to an edible tissue basis. The conversion factor should be supported by adequate data.

I-10.2 Sensory and physical examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with procedures elaborated in Sections I-10.3 through I-10.6, and Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories" (CAC/GL 31-1999).

I-10.3 Determination of count per unit weight or volume

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

I-10.4 Method of analysis of *Escherichia coli* in bivalve molluscs

The ISO/TS 16649-3 ó Horizontal method for the enumeration of beta-glucuronidase-positive *Escherichia coli* ó 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.

I-10.5 Method of analysis of *Salmonella* in bivalve molluscs

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

I-10.6 Determination of biotoxins

The method to be employed in the determination of Saxitoxin group should be AOAC 959.08, or other validated methods that provide equivalent sensitivity, reproducibility and reliability.

I-11 Definition of defectives

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

I-11.1 Foreign matter

The presence in the sample unit of any matter which has not been derived from bivalve molluscs, 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.

I-11.2 Dead or damaged product

The presence of dead or damaged product. Dead product is characterised by no response to percussion (i.e. shellfish will close by themselves when tapped). Damaged product includes product that is damaged to the extent that it can no longer function biologically. A Sample unit shall be considered defective if dead or damaged bivalve molluscs exceed 5% by count.

I-12 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 I-11 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 I-10.3 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;
- (iv) the Food Additives, Contaminants, Hygiene and Labelling requirements of Sections I-6, I-7, I-8 and I-9 are met.

Part II – Raw Bivalve Molluscs

II-4 Description

II-4.1 Product definition

Raw bivalve molluscs processed for direct consumption or for further processing are products that were alive immediately prior to the commencement of processing and comply with Section I-4.2 relating to harvesting, purification and relaying. They have been shucked and/or frozen and/or processed to reduce or limit target organisms while essentially retaining the sensory characteristics of live bivalve molluscs. Raw bivalve molluscs are marketed in a frozen or chilled state.

II-4.2 Process definition

Raw bivalve molluscs must meet the process definition in I-4.2 before they can be processed for direct consumption or further processing.

Bivalve molluscs that have been processed to reduce or limit target organisms while essentially retaining the sensory characteristics of live bivalve molluscs are ones that have been processed to assure reduction or limitation of the target organisms to the satisfaction of the official agency having jurisdiction.

II-4.3 Presentation

Any presentation of the product shall be permitted provided that it:

- (i) meets all requirements of this standard; and
- (ii) is adequately described on the label to avoid confusing or misleading the consumer.

The bivalve molluscs may be packed by weight, count, count per unit of weight, volume or per package.

II-5 Essential composition and quality factors

II-5.1 Raw bivalve molluscs

Raw bivalve molluscs shall be of a quality fit for human consumption.

II-5.2 Ingredients

The packing medium and all other ingredients used shall be of food grade quality and conform to all applicable Codex standards.

II-5.3 Final product

Raw bivalve molluscs shall meet the requirements of this standard when lots examined in accordance with Section II-12 comply with the provisions set out in Section II-11. Raw bivalve molluscs shall be examined by the methods given in Section II-10.

II-6 Food additives

Only the use of the following additives is permitted in raw bivalve molluscs.

Antioxidants

For chilled shucked molluscs any antioxidant listed in food category 09.1.2 (Fresh Molluscs, crustaceans and echinoderms) of the General Standard for Food Additives (CODEX STAN 192-1995, Rev.11-2010).

For raw frozen molluscs any antioxidant listed in food category 09.2.1 (Frozen fish, fish fillets, and fish products, including molluscs, crustaceans, and echinoderms) of the General Standard for Food Additives (CODEX STAN 192-1995, Rev.11-2010).

II-7 Contaminants

Raw bivalve molluscs should meet the requirements of I-7

II-8 Hygiene and handling

Raw bivalve molluscs should meet the requirements of I-8

II-9 Labelling

In addition to the provisions of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Amend. 7-2010) the following specific provisions apply:

II-9.1 Name of the product

The name of the product to be declared on the label shall be the common or usual name of the species of bivalve molluscs in accordance with the law and custom of the country in which the food is sold and in a manner not to mislead the consumer.

II-9.1.1 There shall appear on the label, reference to the presentation provided for in Section II-4.3- Presentation in close proximity to the name of the product in such descriptive terms that will adequately and fully describe the nature of the presentation of the product to avoid misleading or confusing the consumer.

II-9.1.2 In addition to the specified labelling designations above, the usual or common trade names of the variety may be added so long as it is not misleading to the consumer in the country in which the product will be distributed.

II-9.2 Content declaration

Raw bivalve molluscs shall be labelled by weight, count, count per unit weight, or volume as appropriate to the product.

II-9.3 Storage instructions

The label shall specify the conditions for storage and/or temperature that will maintain the food safety and characteristics of the product during transportation, storage and distribution including date of minimum shelf life and for date of shucking.

II-9.4 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;

II-9.5 The name and the address of the manufacturer, packer, distributor, importer or exporter or vendor of the food; and

II-9.6 The label shall indicate the name "Product of the Philippines".

II-9.7 Labelling of non-retail containers

Refer to I-9.4 Labelling of non-retail containers.

II-9.8 Every package containing bivalve molluscs that have been processed to reduce or limit target organisms must be provided with a label certifying that all molluscs have been processed to reduce the target organism to levels acceptable to the official agency having jurisdiction.

II-9.9 Safety claims for bivalve molluscs processed to reduce or limit target organisms should be specific to the target organisms that have been reduced or limited as described in the Code of Practice.

II-10 Sampling, examination and analyses

II-10.1 Sampling

Sampling of lots for examination of net weight shall be carried out in accordance with an appropriate sampling plan meeting the criteria established by the CAC.

II-10.2 Sensory and physical examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with procedures elaborated in Sections II-10.3 through II-10.8, and Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories" (CAC/GL 31-1999).

II-10.3 Determination of net weight and drained weight

The net weight and drained weight of all sample units shall be determined by the procedures described or mentioned in sections II-10.3.1 through II-10.3.5.

II-10.3.1 Determination of net weight

- (i) Weigh the unopened container;
- (ii) Open the container and remove the contents;
- (iii) Weigh the empty container, (including the end) after removing excess liquid and adhering meat;
- (iv) Subtract the weight of the empty container from the weight of the unopened container; and
- (v) The resultant figure will be the total net content.

II-10.3.2 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.

II-10.3.3 Determination of net weight of products covered by glaze

AOAC official method 963.18, Net Contents of Frozen Seafoods

II-10.3.4 The AOAC official method 963.26 should be used to determine the net weight of products with water added that is inside a "block-frozen" product.

II-10.3.5 Determination of drained weight

In the case of shucked bivalve molluscs, the drained weight shall be determined according to AOAC official method 953.11.

II-10.4 Determination of count per unit weight or volume

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

II-10.5 Sample preparation

II-10.5.1 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 bivalve molluscs, until no hard core or ice crystals are left.

II-10.6 Methods of analysis of *Escherichia coli*

Refer to I-10.4 Methods of Analysis of *Escherichia coli*

II-10.7 Method of analysis of *Salmonella*

Refer to I-10.5 Method of analysis of *Salmonella*

II-10.8 Determination of biotoxins

Refer to I-10.6 Determination of Biotoxins

II-11 Definition of defectives

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

II-11.1 Deep dehydration (frozen products)

Greater than 10% of the weight of the bivalve molluscs in the sample unit or greater than 10% of the surface area of the block exhibits excessive loss of moisture clearly shown as

white or abnormal colour on the surface which masks the colour of the flesh and penetrates below the surface, and cannot be easily removed by scraping with a knife or other sharp instrument without unduly affecting the appearance of the bivalve molluscs.

II-11.2 Foreign matter

The presence in the sample unit of any matter which has not been derived from bivalve molluscs, 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.

II-11.3 Odour/flavour

Persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity.

II-11.4 Texture

Textural breakdown of the flesh, indicative of decomposition, characterized by muscle structure that is mushy or paste-like.

II-12 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 II-11 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 II-10.4 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;
- (iv) the Food Additives, Contaminants, Hygiene and Labelling requirements of Sections II-6, II-7, II-8 and II-9 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.

BFAR Fisheries Administrative Order 235 s. 2010. Safety and quality control standards for PSP (paralytic shellfish poison). Bureau of Fisheries and Aquatic Resources. Department of Agriculture. Philippines.

CAC/GL 50-2004. General Guidelines on Sampling. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CAC/GL 31-1999. Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CAC/GL 21-1997. Principles for the Establishment and Application of Microbiological Criteria for Foods. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CAC/RCP 52-2003, Rev.5-2010. Code of Practice for Fish and Fishery Products. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CAC/RCP 1-1969, Rev.4-2003. Recommended International Code of Practice ó General Principles of Food Hygiene. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CODEX/STAN 292-2008. Standard for Live and Raw Bivalve Molluscs. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CODEX/STAN 193-1995, Rev.4-2009, Amend.2-2010. Codex General Standard for Contamination and Toxins in Foods. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CODEX/STAN 192-1995, Rev.11-2010. General Standard for Food Additives. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

CODEX STAN 1-1985, Amend.7-2010. Codex General Standard for the Labelling of Prepackaged Foods. Food and Agriculture Organization/World Health Organization. Codex Alimentarius Commission. Rome, Italy.

FAO/WHO 2009. Procedural Manual 18th Ed. Joint Food and Agriculture Organization/World Health Organization Food Standards Programme. Codex Alimentarius Commission. Rome, Italy.

FDA Regulation No. 001 s. 1982. Guidelines for Open-Date Marking of Pre-packaged Foods.
Food and Drugs Administration. Department of Health. Philippines.



BUREAU OF AGRICULTURE AND FISHERIES PRODUCT STANDARDS

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines
T/ (632) 920.6131 / 455.2856 / 467.9039
TF/ (632) 455.2858
E-mail: bafpsda@yahoo.com.ph