

C O D E X A L I M E N T A R I U S

INTERNATIONAL FOOD STANDARDS



Food and Agriculture
Organization of
the United Nations



World Health
Organization

E-mail: codex@fao.org - www.codexalimentarius.org

STANDARD FOR LIVE ABALONE AND FOR RAW FRESH CHILLED OR FROZEN ABALONE FOR DIRECT CONSUMPTION OR FOR FURTHER PROCESSING

CXS 312-2013

Adopted in 2013. Amended in 2016 and 2024.

2024 Amendments

Following decisions taken at the Forty-seventh Session of the Codex Alimentarius Commission in November 2024, amendments were made in Sections 1.7.4 and 2.6.4 Labelling of non-retail containers by replacing the text with a reference to the *General standard for the labelling of non-retail containers of foods* (CXS 346-2021); and Sections 1.8 and 2.7 Sampling, examination and analysis were amended by replacing methods of analysis and numeric performance criteria with a reference to the *Recommended methods of analysis and sampling* (CXS 234-1999).

1. SCOPE

This standard applies to live abalone and/or raw fresh chilled or frozen abalone of the genus *Haliotis*. Raw fresh chilled or frozen abalone may be whole or shucked with the viscera removed. The epithelium, mucous and radula may be removed. Chilling or freezing is done in such a way that essentially the characteristics of live abalone are retained. Both live and raw fresh chilled or frozen abalone may be intended for direct consumption or further processing. Part 1 below applies to live abalone, while Part 2 applies to raw fresh chilled or frozen abalone.

PART 1 – LIVE ABALONE

1.2 Description

1.2.1 Product definition

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

1.2.2 Process definition

Live abalone may be wild caught or farmed. They may be purged in clean seawater and/or drained prior to packaging for direct human consumption or for further processing as in Section 2.1.2.

1.2.3 Presentation

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

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

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

1.3 Essential composition and quality factors

1.3.1 Abalone

The abalone must be alive and possess organoleptic characteristics associated with freshness, and freedom from taint or extraneous matter, as determined by specialists familiar with the species concerned.

1.3.2 Final product

Live abalone shall meet the requirements of this standard when lots comply with the provisions of Section 1.10. Live abalone shall be examined by the methods given in Sections 1.8 and 1.9.

1.4 Food additives

Food additives are not permitted in live abalone.

1.5 Contaminants

The products covered by this standard shall comply with the maximum levels of the *General standard for contaminants and toxins in foods and feeds* (CXS 193-1995)¹ and the maximum residue limits for veterinary drugs established by the Codex Alimentarius Commission.

Abalone from some geographical areas have been found to accumulate certain marine biotoxins. It is up to the competent authority (using risk assessment) to determine whether a risk exists in any geographical areas under its control and if so, put in the necessary mechanisms to ensure that the part of the abalone to be consumed meets with the marine biotoxins level in the *Standard for live and raw bivalve molluscs* (CXS 292-2008).² The risk assessments should be undertaken in accordance with the *Working principles for risk analysis for food safety for application by governments* (CXG 62-2007).³

1.6 Hygiene and handling

It is recommended that the products covered by provisions of this standard be prepared and handled in accordance with the appropriate sections of the *General principles of food hygiene* (CXC 1-1969),⁴ the *Code of practice for fish and fishery products* (CXC 52-2003)⁵ and other relevant Codex codes of hygienic practice and codes of practice.

The products should comply with any microbiological criteria established in accordance with the *Principles and guidelines for the establishment and application of microbiological criteria related to foods* (CXG 21-1997).⁶

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

1.7 Labelling

In addition to the provisions of the *General standard for the labelling of pre-packaged foods* (CXS 1-1985)⁷ the following specific provisions apply:

1.7.1 *The name of the food*

The name of the food to be declared on the label shall be the common or usual name of the species of abalone 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.

There shall appear on the label, reference to the presentation (provided for in Section 1.2.3 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.

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.

The country where the product is sold can determine if the scientific name must be indicated on the label.

1.7.2 *Content declaration*

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

1.7.3 *Storage instructions*

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

1.7.4 *Labelling of non-retail containers*

The labelling of non-retail containers should be in accordance with the *General standard for the labelling of non-retail containers of foods* (CXS 346-2021).⁸

The durability or shelf life may be required in the country where the product is sold. Date of minimum durability may be replaced by the statement "Abalone must be alive when sold to the final consumer".

1.8 Sampling, examination and analysis

1.8.1 *Sampling*

- Under development.

1.8.2 *Examination*

1.8.2.1 Sensory and physical examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with the *Recommended methods of analysis and sampling* (CXS 234-1999)⁹ and *Guidelines for the sensory evaluation of fish and shellfish in laboratories* (CXG 31-1999).¹⁰

1.8.2.2 Determination of count per unit weight or volume

When declared on the label, the count 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 to determine the count per unit weight or volume.

1.8.3 *Analysis*

For checking the compliance with this standard, the methods of analysis and sampling contained in the the *Recommended methods of analysis and sampling* (CXS 234-1999) relevant to the provisions in this standard shall be used.

1.9 Definition of defectives

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

1.9.1 *Foreign matter*

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

1.9.2 *Dead or damaged product*

A 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. A damaged abalone is flawed to the extent that its integrity is affected. The sample unit is defective if more than 5 percent of the abalones by count in the sample unit are dead or damaged.

1.10 Lot acceptance

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

- the total number of defectives as classified according to Section 1.9 does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.
- the average count designation as defined in Section 1.8.2.2 is within the declared count, and the total number of samples not meeting the count designation does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.
- 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
- the essential composition and quality factors, food additives, contaminants, hygiene and handling and labelling requirements of Sections 1.3, 1.4, 1.5, 1.6 and 1.7 are met.

PART 2 – RAW FRESH CHILLED OR FROZEN ABALONE

2.1 Description

2.1.1 *Product definition*

Raw fresh chilled or frozen whole abalone prepared for direct consumption or for further processing are products that were alive immediately prior to the commencement of freezing and/or processing and comply with Section 1.2.2. They have been chilled or frozen whole or shucked with the viscera removed. The epithelium, mucous or radula may be removed.

2.1.2 *Process definition*

The product is harvested as in Section 1.2.2 and after suitable preparation is subjected to a chilling or freezing process complying with the conditions laid down hereafter. The chilling process shall be carried out in appropriate equipment in such a way as to ensure the product shall be quickly brought down to the temperature of melting ice (with a maximum tolerance of -2 °C to +4 °C). The product shall be kept chilled at this temperature so as to maintain the quality during transportation, storage and distribution.

The freezing process shall be carried out in appropriate equipment in such a way that the range of maximum ice crystallization is passed quickly. The quick-freezing process shall not be regarded as complete unless and until the product temperature has reached -18 °C or colder at the thermal centre after thermal stabilization. The product shall be kept deep frozen at -18 °C or colder so as to maintain the quality during transportation, storage and distribution.

2.1.3 *Presentation*

Refer to Section 1.2.3.

2.2 Essential composition and quality factors

2.2.1 *Raw fresh chilled or frozen abalone*

Raw abalone shall be of a quality fit for human consumption.

2.2.2 *Glazing (for frozen abalone only)*

If glazed, the water used for glazing or preparing glazing solutions shall be of potable quality or shall be clean seawater. Potable water is freshwater fit for human consumption. Standards of potability shall not be less than those contained in the latest edition of the World Health Organization's *Guidelines for drinking-water quality*.¹¹ Clean seawater is seawater which meets the same microbiological standards as potable water and is free from objectionable substances.

2.2.3 *Other ingredients*

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

2.2.4 Final product

Raw fresh chilled or frozen abalone shall meet the requirements of this standard when lots examined in accordance with Section 2.7 and Section 2.8 comply with the provisions set out in Section 2.9.

2.3 Food additives

Food additives are not permitted in raw fresh chilled or frozen abalone.

2.4 Contaminants

Refer to Section 1.5 (Contaminants).

2.5 Hygiene

Abalone should meet the requirements of Section 1.6 prior to chilling/freezing. After processing they should retain visual characteristics associated with freshness, including, where relevant, shells free of dirt.

2.6 Labelling

In addition to the provisions of the *General standard for the labelling of pre-packaged foods* (CXS 1-1985)⁷ the following specific provisions apply:

2.6.1 The name of the food

The name of the food to be declared on the label shall be the common or usual name of the species of abalone 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.

There shall appear on the label, reference to the presentation (provided for in Section 2.1.3 (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.

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.

The country where the product is sold can determine if the scientific name must be indicated on the label.

2.6.2 Content declaration

Raw fresh chilled or frozen abalone shall be labelled by weight, count, count per unit weight, or volume as appropriate to the product.

Where the frozen food has been glazed, the declaration of the net weight of the food shall be exclusive of the glaze.

2.6.3 Storage instructions

The label shall specify the conditions for storage and/or temperature that will maintain the product safety/quality during transportation, storage and distribution including date of minimum durability and date of shucking where required in the country of sale.

2.6.4 Labelling of non-retail containers

The labelling of non-retail containers should be in accordance with the *General standard for the labelling of non-retail containers of foods* (CXS 346-2021).⁸

2.7 Sampling, examination and analysis

2.7.1 Sampling

Refer to Section 1.8.1.

2.7.2 Examination

2.7.2.1 Sensory and physical examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with the *Recommended methods of analysis and sampling* (CXS 234-1999)⁹ and the *Guidelines for the sensory evaluation of fish and shellfish in laboratories* (CXG 31-1999).¹⁰

2.7.2.2 Determination of count per unit weight or volume

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

2.7.3 Analysis

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended methods of analysis and sampling* (CXS 234-1999)⁹ relevant to the provisions in this standard, shall be used.

2.8 Definition of defectives

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

2.8.1 Deep dehydration

An area of greater than 10 percent of the surface of the abalones in the sample unit 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 abalone, which affects more than 10 percent of the weight of the abalones in the sample unit.

2.8.2 Foreign matter

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

2.8.3 Odour/Flavour

Persistent and distinct objectionable odours or flavours indicative of decomposition, rancidity, or other odours or flavours unfit for food.

2.8.4 Texture

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

2.9 Lot acceptance

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

- the total number of defectives as classified according to Section 2.8 does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5;
- the average count designation as defined in the *Recommended methods of analysis and sampling* (CXS 234-1999) (net weight provision for frozen abalone (covered by glaze) and Appendix III) is within the declared count, and the total number of samples not meeting the count designation does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5;
- 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
- the essential composition and quality factors, food additives, contaminants, hygiene and handling and labelling requirements of Sections 2.2, 2.3, 2.4, 2.5, and 2.6 are met.

NOTES

¹ FAO and WHO. 1995. *General standard for contaminants and toxins in food and feed*. Codex Alimentarius Standard, No. CXS 193-1995. Codex Alimentarius Commission. Rome.

² FAO and WHO. 2008. *Standard for live and raw bivalve molluscs*. Codex Alimentarius Standard, No. CXS 292-2008. Codex Alimentarius Commission. Rome.

³ FAO and WHO. 2007. *Working principles for risk analysis for food safety for application by governments*. Codex Alimentarius Guideline, No. CXG 62-2007. Codex Alimentarius Commission. Rome.

⁴ FAO and WHO. 1969. *General principles of food hygiene*. Codex Alimentarius Code of Practice, No. CXC 1-1969. Codex Alimentarius Commission. Rome.

⁵ FAO and WHO. 2003. *Code of practice for fish and fishery products*. Codex Alimentarius Code of Practice, No. CXC 52-2003. Codex Alimentarius Commission. Rome.

⁶ FAO and WHO. 1997. *Principles and guidelines for the establishment and application of microbiological criteria for foods*. Codex Alimentarius Guideline, No. CXG 21-1997. Codex Alimentarius Commission. Rome.

⁷ FAO and WHO. 1985. *General standard for the labelling of pre-packaged foods*. Codex Alimentarius Standard, No. CXS 1-1985. Codex Alimentarius Commission. Rome.

⁸ FAO and WHO. 2021. *General standard for the labelling of non-retail containers of foods*. Codex Alimentarius Standard, No. CXS 346-2021. Codex Alimentarius Commission. Rome.

⁹ FAO and WHO. 1999. *Recommended methods of analysis and sampling*. Codex Alimentarius Standard, No. CXS 234-1999. Codex Alimentarius Commission. Rome.

¹⁰ FAO and WHO. 1999. *Guidelines for the sensory evaluation of fish and shellfish in laboratories*. Codex Alimentarius Guideline, No. CXG 31-1999. Codex Alimentarius Commission. Rome.

¹¹ WHO. 2017. *Guidelines for drinking-water quality: fourth edition incorporating the first addendum*. Geneva. www.who.int/publications/i/item/9789241549950