

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

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STANDARD FOR CANNED TUNA AND BONITO

CXS 70-1981

Adopted in 1981. Revised in 1995. Amended in 2011, 2013, 2016, 2018.

1. SCOPE

This standard applies to canned tuna and bonito. It does not apply to speciality products where the fish content constitutes less than 50% m/m of the contents.

2. DESCRIPTION

2.1 Product Definition

Canned Tuna and Bonito are the products consisting of the flesh of any of the appropriate species listed below, packed in hermetically sealed containers.

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|-----------------------------|--|
| – <i>Thunnus alalunga</i> | – <i>Euthynnus affinis</i> |
| – <i>Thunnus albacares</i> | – <i>Euthynnus alleteratus</i> |
| – <i>Thunnus atlanticus</i> | – <i>Euthynnus lineatus</i> |
| – <i>Thunnus obesus</i> | – <i>Katsuwonus pelamis</i> (syn. <i>Euthynnus pelamis</i>) |
| – <i>Thunnus maccoyii</i> | – <i>Sarda chilensis</i> |
| – <i>Thunnus thynnus</i> | – <i>Sarda orientalis</i> |
| – <i>Thunnus tonggol</i> | – <i>Sarda sarda</i> |

2.2 Process Definition

The products shall have received a processing treatment sufficient to ensure commercial sterility.

2.3 Presentation

The product shall be presented as:

Solid (skin-on or skinless) - fish cut into transverse segments which are placed in the can with the planes of their transverse cut ends parallel to the ends of the can. The proportion of free flakes or chunks shall not exceed 18% of the drained weight of the container.

Chunk - pieces of fish most of which have dimensions of not less than 1.2 cm in each direction and in which the original muscle structure is retained. The proportion of pieces of flesh of which the dimensions are less than 1.2 cm shall not exceed 30% of the drained weight of the container.

Flake or flakes - a mixture of particles and pieces of fish most of which have dimensions less than 1.2 cm in each direction but in which the muscular structure of the flesh is retained. The proportion of pieces of flesh of which the dimensions are less than 1.2 cm exceed 30% of the drained weight of the container.

Grated or shredded - a mixture of particles of cooked fish that have been reduced to a uniform size, in which particles are discrete and do not comprise a paste.

Any other presentation shall be permitted provided that it:

- is sufficiently distinctive from other forms of presentation laid down in this standard;
- meets all other requirements of this standard;
- is adequately described on the label to avoid confusing or misleading the consumer.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Raw material

The products shall be prepared from sound fish of the species in sub-section 2.1 and of a quality fit to be sold fresh for human consumption.

3.2 Other Ingredients

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

3.3 Decomposition

The products shall not contain more than 10 mg/100 g of histamine based on the average of the sample unit tested.

3.4 Final Product

Products shall meet the requirements of this Standard when lots examined in accordance with Section 9 comply with the provisions set out in Section 8. Products shall be examined by the methods given in Section 7.

4. FOOD ADDITIVES

Acidity regulators used in accordance with Tables 1 and 2 of the General Standard for Food Additives (CXS 192-1995) in food category 09.4 (Fully preserved, including canned or fermented fish and fish products, including mollusks, crustaceans, and echinoderms) and only certain Table 3 acidity regulators, emulsifiers, gelling agents, stabilizers and thickeners as indicated in Table 3 of the [General Standard for Food Additives \(CXS 192-1995\)](#) are acceptable for use in foods conforming to this Standard.

The flavourings used in products covered by this standard should comply with the [Guidelines for the Use of Flavourings \(CXG 66-2008\)](#). Only natural flavouring substances, natural flavouring complexes and smoke flavourings are permitted in products covered by this Standard.

5. HYGIENE

It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the [General Principles of Food Hygiene \(CXC 1-1969\)](#), the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#), the [Code of Hygienic Practice for Low Acid and Acidified Low-Acid Canned Foods \(CXC 23-1979\)](#) 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 \(CXG 21-1997\)](#).

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

When tested by appropriate methods of sampling and examination as prescribed by the Codex Alimentarius Commission, the product:

- (i) shall be free from micro-organisms capable of development under normal conditions of storage;
- (ii) no sample unit shall contain histamine that exceeds 20 mg per 100 g;
- (iii) shall not contain any other substance including substances derived from microorganisms in amounts which may represent a hazard to health in accordance with standards established by the Codex Alimentarius Commission;
- (iv) shall be free from container integrity defects which may compromise the hermetic seal.

6. LABELLING

In addition to the provisions of the [General Standard for the Labelling of Prepackaged Foods \(CXS 1-1985\)](#) the following specific provisions apply:

6.1 Name of the Food

The name of the product as declared on the label shall be "tuna" or "bonito", and may be preceded or followed by the common or usual name of the species, both in accordance with the law and custom of the country in which the product is sold, and in a manner not to mislead the consumer.

The name of the product may be qualified or accompanied by a term descriptive of the colour of the product, provided that the term "white" shall be used only for *Thunnus alalunga* and the terms "light", "dark" and "blend" shall be used only in accordance with any rules of the country in which the product is sold.

6.1.1 Form of presentation

The form of presentation provided for in Section 2.3 shall be declared in close proximity to the common name.

The name of the packing medium shall form part of the name of the food.

7. SAMPLING, EXAMINATION AND ANALYSES

7.1 Sampling

- (i) Sampling of lots for examination of the final product as prescribed in Section 3.3 shall be in accordance with an appropriate sampling plan with an AQL of 6.5;
- (ii) Sampling of lots for examination of net weight and drained weight where appropriate shall be carried out in accordance with an appropriate sampling plan established by the CAC.

7.2 Sensory and Physical Examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with the procedures set out in Sections 7.3 through 7.5, Annex A and the [Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories \(CXG 31 - 1999\)](#).

7.3 Determination of Net Weight

Net contents of all sample units shall be determined by the following procedure:

- (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. The resultant figure will be the net content.

7.4 Determination of Drained Weight

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

- (i) Maintain the container at a temperature between 20°C and 30°C for a minimum of 12 hours prior to examination.
- (ii) Open and tilt the container to distribute the contents on a pre-weighed circular sieve which consists of wire mesh with square openings of 2.8 mm x 2.8 mm.
- (iii) Incline the sieve at an angle of approximately 17-20° and allow the fish to drain for two minutes, measured from the time the product is poured into the sieve.
- (iv) Weigh the sieve containing the drained fish.
- (v) The weight of drained fish is obtained by subtracting the weight of the sieve from the weight of the sieve and drained product.

7.5. Determination of Washed Drained Weight (for packs with sauces)

- (i) Maintain the container at a temperature between 20°C and 30°C for a minimum of 12 hours prior to examination.
- (ii) Open and tilt the container and wash the covering sauce and then the full contents with hot tap water (approx. 40°C), using a wash bottle (e.g. plastic) on the tared circular sieve.
- (iii) Wash the contents of the sieve with hot water until free of adhering sauce; where necessary separate optional ingredients (spices, vegetables, fruits) with pincers. Incline the sieve at an angle of approximately 17-20° and allow the fish to drain two minutes, measured from the time the washing procedure has finished.
- (iv) Remove adhering water from the bottom of the sieve by use of paper towel. Weigh the sieve containing the washed drained fish.
- (v) The washed drained weight is obtained by subtracting the weight of the sieve from the weight of the sieve and drained product.

7.6 Determination of Presentation

The presentation of all sample units shall be determined by the following procedure.

- (i) Open the can and drain the contents, following the procedures outlined in 7.4.
- (ii) Remove and place the contents onto a tared 1.2 cm mesh screen equipped with a collecting pan.

- (iii) Separate the fish with a spatula being careful not to break the configuration of the pieces. Ensure that the smaller pieces of fish are moved to the top of a mesh opening to allow them to fall through the screen onto the collecting pan.
- (iv) Segregate the material on the pan according to flaked, grated (shredded) or paste and weigh the individual portions to establish the weight of each component.
- (v) If declared as a "chunk" pack weigh the screen with the fish retained and record the weight. Subtract the weight of the sieve from this weight to establish the weight of solid and chunk fish.
- (vi) If declared as "solid" pack remove any small pieces (chunks) from the screen and reweigh. Subtract the weight of the sieve from this weight to establish the weight of "solid" fish.

Calculations

- (i) Express the weight of flaked, grated (shredded and paste) as a percentage of the total drained weight of fish.

$$\% \text{ flakes} = \frac{\text{Weight of flakes}}{\text{Total weight of drained fish}} \times 100$$

- (ii) Calculate the weight of solid and chunk fish retained on the screen by difference and express as a % of the total drained weight of fish.

$$\% \text{ solid chunk fish} = \frac{\text{Weight of solid \& chunk fish}}{\text{Total weight of drained fish}} \times 100$$

- (iii) Calculate the weight of solid fish retained on the screen by difference and express as a % of the total drained weight of the fish.

$$\% \text{ of solid fish} = \frac{\text{Weight of solid fish}}{\text{Total weight of drained fish}} \times 100$$

7.7. Determination of Histamine

Methods meeting the following method performance criteria may be used:

ML (mg/100g)	Minimum applicable range (mg/100 g)	LOD (mg/100 g)	LOQ (mg/100g)	RSDR (%)	Recovery	Applicable methods that meet the criteria
10 (average)	8 – 12	1	2	16.0	90 – 107	AOAC 977.13 NMKL 99, 2013 NMKL 196, 2013
20 (each unit)	16 – 24	2	4	14.4	90 – 107	AOAC 977.13 NMKL 99, 2013 NMKL 196, 2013

8. DEFINITION OF DEFECTIVES

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

8.1 Foreign Matter

The presence in the sample unit of any matter, which has not been derived from fish, 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 practices and sanitation practices.

8.2 Odour/Flavour

A sample unit affected by persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity.

8.3 Texture

- (i) Excessively mushy flesh uncharacteristic of the species in the presentation; or
- (ii) Excessively tough flesh uncharacteristic of the species in the presentation; or
- (iii) Honey-combed flesh in excess of 5% of the drained contents.

8.4 Discolouration

A sample unit affected by distinct discolouration indicative of decomposition or rancidity or by sulphide staining of the meat exceeding 5% of the drained contents.

8.5 Objectionable Matter

A sample unit affected by struvite crystals greater than 5 mm in length.

9. 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 8 does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5;
- (ii) the total number of sample units not meeting the presentation and colour designation as defined in Section 2.3 does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5;
- (iii) the average net weight or the average weight of drained meat of all sample units examined is not less than the declared weight, and provided there is no unreasonable shortage in any individual container;
- (iv) the Food Additives, Hygiene and Labelling requirements of Sections 4, 5 and 6 are met.

SENSORY AND PHYSICAL EXAMINATION

1. Complete examination of the can exterior for the presence of container integrity defects or can ends which may be distorted outwards.
2. Open can and complete weight determination according to defined procedures in Sections 7.3 and 7.4.
3. Examine the product for discolouration.
4. Carefully remove the product and determine the presentation according to the defined procedures in Section 7.5.
5. Examine product for discolouration, foreign matter and struvite crystals. The presence of a hard bone is an indicator of under processing and will require an evaluation for sterility.
6. Assess odour, flavour and texture in accordance with the [*Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories \(CAC/GL 31-1999\)*](#).