CHAPTER 2, STANDARD 1

CANNED TUNA STANDARD

1. INTRODUCTION

This standard for canned tuna derives its authority from the Fish Inspection Regulations. It defines minimum acceptability of canned tuna for taint, decomposition, unwholesomeness and other requirements other than weight, as defined in the Fish Inspection Regulations, and describes methods for determining that acceptability.

2. SCOPE

This standard applies to canned and/or heat processed tuna in hermetically sealed containers, prepared from sound, wholesome fish flesh of a quality fit for human consumption, using current good manufacturing practices and prepared from any of the following species:

1. Euthynnus alletteratus (little tunny)
2. Euthynnus lineatus (little tunny or black skipjack)
3. Euthynnus affinis (kawakawa or little tuna)
4. Katsuwonus pelamis (skipjack)
5. Thunnus albacares (yellow-fin tuna)
6. Thunnus tonggol or Neothunnus rarus (longtailed tuna or northern bluefin tuna)
7. Thunnus obesus (big-eyed tuna)
8. Thunnus atlanticus (black-fin tuna)
9. Thunnus alalunga (albacore)
10. Thunnus maccoyii (southern bluefin tuna)
11. Thunnus orientalis (oriental tuna)
12. Thunnus thynnus (bluefin tuna)

The species of fish Sarda chiliensis, Sarda lineolata or Sarda sarda after it has been canned, shall be designated as "Bonito" or "Bonito Tuna".

The following documents are to be used in conjunction with the standard to determine good manufacturing practices:

1) the Recommended International Code of Hygienic Practice for Low Acid and Acidified Low Acid Canned Food, CAC/RCP 23-1979.

2) Metal Can Defects Identification and Classification Manual, Department of Fisheries and Oceans, Inspection Services, 1989.

3) Recommended International Code of Practice for Canned Fish, CAC/RCP 10-1976.

3. FORMS OF PRODUCT PRESENTATION

3.1 Styles of Pack

a) Solid
Fish cut into transverse segments to which no free fragments are added. In containers of 450 g (one pound) or less of net contents, such segments are cut into lengths suitable for packing into one layer. In containers of more than 450 g net contents, such segments may be cut into lengths suitable for packing in one or more layers of equal thickness and no layer shall have a thickness less than 2.5 cm. Segments are placed in the can with the planes of their transverse cut ends parallel to the ends of the can. A piece of segment may be added if necessary to fill a container.

b) Chunk or chunks
A mixture of 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.

c) Flake, flaked or flakes
A mixture of particles of fish in which the muscle structure of the flesh is retained.

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

3.2 Fish Flesh Colour

The labels on all cans of tuna shall indicate the colour of the fish flesh in accordance with the following colour classifications:

a) "White Meat Tuna" or "White Tuna"
Canned tuna of the species Thunnus alalunga or Thunnus germo (albacore) that has a diffuse luminous reflectance of not less than 33.7% of that of magnesium oxide when that reflectance is measured by a prescribed method. This is approximately equivalent to 6.3 Munsell units.

b) "Light Meat Tuna" or "Light Tuna"
Canned tuna that has a diffuse luminous reflectance of not less than 22.6% of that of magnesium oxide when that reflectance is measured by a prescribed method. This is approximately equivalent to 5.3

Munsell units.

c) "Dark Meat Tuna" or "Dark Tuna"
Canned tuna that does not meet the colour requirements of "Light Meat Tuna".

3.3 Packing Media

a) Olive oils
In conformity with the Recommended International Standard for Olive Oil, Virgin and Refined, and for Refined Olive-Residue Oil (Ref. CAC/RS 33-1970).

b) Other vegetable oils
Clear, refined, deodorized, edible vegetable oil in conformity with the relevant recommended international standards adopted by the Codex Alimentarius Commission.

c) Potable water
In conformity with the latest WHO International Standards for Drinking Water.

d) Spring water or mineral water
Potable water from an underground source but not obtained from a public community water supply and which meets the requirements of Section B12.001 of the Food and Drug Regulations.

e) Vegetable broth
The liquid arising from the cooking of vegetables in water and which may be prepared from one or more types of vegetables.

f) Vegetable broth / Vegetable oil
Any combination of vegetable broth and vegetable oil meeting the above specifications.

3.4 Other Presentations

Any other presentation may be permitted provided that it:

a) is sufficiently distinctive from the forms of presentations set out in 3.1 and 3.3; and

b) meets all other requirements of the Fish Inspection Regulations; and

c) is adequately described on the label.

4. SAMPLING

The sampling and tolerance plans at the front of this manual shall be used to determine the acceptability of the lot. The sampling plans dictate the minimum sample size to be taken. If necessary, in the opinion of the inspector, more than the minimum sample size specified may be taken.

4.1 Sampling of lots for examination of the product shall be in accordance with the FAO/WHO Codex Alimentarius Sampling Plans for Prepackaged Foods(AQL 6.5) (CAC/RM42-1969) except that acceptance numbers for decomposition shall be reduced in accordance with the sampling plans.

4.2 Size of Sample Unit

The sample unit shall consist of a can or pouch of tuna and the contents thereof.

5. DESCRIPTION OF DEFECTS

5.1 Taint

A unit will be considered tainted when any of the following conditions exist:

a) Rancid
Odour characterized by the distinct or readily detectable persistent odour of oxidized oil, (this may be characterized by a pungent sensation in the nasal passage); or

Flavour characterized by distinct flavours present individually or in combination as follows:

bitter, sour, metallic flavours detected at the sides and back of the tongue leaving a lingering aftertaste.

b) Abnormal
Distinct and persistent odours and/or flavours that are burnt or acrid, (e.g. as associated with excess scorch).

c) Contaminated
Odours and/or flavours resulting from contamination by solvents, soaps, fuel, oil, grease, etc. that are organoleptically detectable.

5.2 Decomposition

A unit will be considered decomposed when any of the following conditions exist:

a) Persistent, distinct and uncharacteristic odour characterized by:

1) fruity (aldehyde odours similar to pineapple or other fruits);

2) vegetable odours - (e.g. turnip and cabbage-like but not associated with packing medium);

3) sour, yeasty fermented odours;

4) ammonia odours, hydrogen sulphide odours; or

5) other pungent odours such as putrid or faecal.

b) Persistent distinct and uncharacteristic flavours characterized by:

1) sweet fruity flavours (e.g. pineapple-like); or

2) vegetable flavours (e.g. turnip and cabbage-like but not associated with packing medium); or

3) putrid or sour or faecal flavours.

c) Texture

Breakdown of muscle structure characterized by muscle fibers no longer being detectable resulting in the presence of small particles and/or granular, gritty or pasty texture exceeding 20% of the drained content.

d) Appearance

1) Discoloration characterized by persistent flushed pink, orange or green colours in the flesh exceeding 5% of drained contents.

2) True Honeycombing exceeding 5% of drained contents.

5.3 Unwholesome

a) Critical Foreign Material
A lot will be considered defective when any of the following conditions exist:

the presence of any material which has not been derived from tuna (and packing media) and which poses a threat to human health (such as glass, etc.); or

distinct and persistent odour or flavour of any material which has not been derived from tuna (and packing media) and which

poses a threat to human health (such as solvents, fuel oil, etc.).

b) Foreign Material

A unit will be considered defective when the following condition is found:

the presence of any material which has not been derived from tuna (and packing media) but does not pose a threat to human health (such as insect pieces, sand, etc.).

c) Other Defects

A unit will be considered defective when any of the following conditions exist:

a) **Struvite Crystals** (magnesium ammonium phosphate crystals)
Any struvite crystal greater than 5 mm in length.

b) **Sulphide Blackening**
Staining of the meat exceeding 5% of the drained contents.

5.4 Labelling

A unit will be considered defective when any of the following conditions exist:

a) Style of Pack

1) Solid – Greater than 18% chunk and/or flaked.
Chunk – Greater than 50% flaked.
Flaked – Greater than 20% grated or shredded.

2) Shredded, grated or paste in solid or chunk pack.

b) Fish Flesh Colour

1) White Meat Tuna or White Tuna of the species Thunnus alalunga of Thunnus germo (albacore) that has a diffuse luminous reflectance less than 33.7% of that of magnesium oxide. This is approximately equivalent to 6.3 Munsell units.

2) Light Meat Tuna or Light Tuna that has a diffuse luminous reflectance less than 22.6% of that of magnesium oxide. This is approximately equivalent to 5.3 Munsell units.

NOTE: Dark Meat Tuna or Dark Tuna is canned tuna that does not meet the colour requirements of Light Meat Tuna.

6. EXAMINATION METHODS

6.1 Procedure for Determining Compliance for Style of Pack Declaration

6.1.1 Scope and Application

This procedure is applicable to the determination of the percentage of different styles of pack in canned tuna.

6.1.2 Apparatus

- Can opener
- One-half inch (1.2 cm) mesh screen equipped with a collecting pan
- Suitable balance for weighing the samples to the nearest 0.1 g
- Spatula

6.1.3 Procedure

1) Open the can, drain the contents, weigh the tuna and record the weight.

2) Pour the drained can contents onto a tared 1.2 cm mesh screen equipped with a collecting pan.

3) Separate the tuna with a spatula being careful not to break the configuration of the pieces. Ensure that the smaller pieces of tuna are moved to the top of a mesh opening to allow them to fall through or be retained on the screen.

4) Segregate the material on the pan according to flaked, grated (shredded) and paste and weigh individually in order to establish the weight of each component.

5) Weigh the screen with the fish retained and record the weight. This weight will be used, by difference, to establish the weight of solid plus chunk tuna.

6) In the case of a "solid" declaration, remove any small pieces (chunks) from the screen and reweigh. This weight can be used to establish the weight of solid tuna by difference.

6.1.4 Calculations

1) Express the weight of flaked, grated (shredded) and paste as a percentage of the total drained weight of tuna.

$$\% \text{ Flakes} = \frac{\text{Weight of Flakes}}{\text{Total Weight of Drained Tuna}} \times 100$$

2) Calculate the weight of solid and chunk tuna retained on the screen by difference and express as a % of the total drained weight of tuna.

$$\% \text{ Solid \& Chunk Tuna} = \frac{\text{Weight of Solid \& Chunk Tuna}}{\text{Total Weight of Drained Tuna}} \times 100$$

3) Calculate the weight of solid tuna retained on the screen by difference and express as a % of the total drained weight of tuna.

$$\% \text{ Solid Tuna} = \frac{\text{Weight of Solid Tuna}}{\text{Total Weight of Drained Tuna}} \times 100$$

6.1.5 Determination of compliance

Refer to section 5.4 to determine the defect classification of the sample unit.

6.2 <u>Procedure for Determining Percentage of Honeycombing in Canned Tuna</u>

6.2.1 Scope

This method shall be used to assess the extent of honeycombing in canned tuna.

The departmental canned tuna standard stipulates that a sample unit shall be considered defective because of decomposition if the weight of honeycombed flesh exceeds 5% of the drained weight of the contents of the can.

6.2.2 Laboratory Apparatus

- Can opener
- Electronic Scale
- Beakers or Draining Trays
- Vacuum Gauge
- Clock or other suitable timing device
- Warming Cabinet
- Tared Collecting Dishes
- Tweezers or Forceps
- Spatula
- Appropriate forms

6.2.3 Procedure

1) Determine the drained weight of each sample unit, using the approved method.

2) After draining, transfer the contents of the can to an inspection tray or, if style of pack is to be determined, a 1.2 cm mesh screen

equipped with a collecting pan.

3) Separate the tuna with a spatula being careful not to break the configuration of the pieces. If the contents are to be evaluated for style of pack, that procedure must be performed first, using the method outlined in section 6.1 of this standard.

4) Using tweezers or forceps remove all pieces of honeycombed fish flesh and place these in a tared collecting dish.

"Any piece of tuna flesh showing evidence of pitting, whether on the surface of the cut or between the layers of fish flesh, shall be considered to be affected by honeycombing."

5) Weigh the collecting dish with the honeycombed flesh and record the total weight. Subtract the weight of the collecting dish from the total weight of the dish and honeycombed flesh to obtain the weight of honeycombed flesh.

6.2.4 Calculations

Express the weight of the honeycombed flesh as a percentage of the drained weight of the can contents.

$$\% \text{ of True Honeycombing} = \frac{\text{Weight of the Honeycombed Fish Flesh}}{\text{Drained Weight}} \times 100$$

6.2.5 Determination of Compliance

1) If the result exceeds 5% of the drained weight of the can contents, the sample unit is considered defective.

2) Repeat the above procedure and determine the status of the remaining sample units in the sample. A sample shall consist of at least the minimum number of sample units outlined in the sampling plans.

3) Determine the status of the lot by comparing the total number of defective sample units with the acceptance number for decomposition.

7. CLASSIFICATION OF "DEFECTIVES"

A sample unit which contains defects as described in section 5 is classified as a "defective".

8. LOT ACCEPTANCE

A lot will be considered unacceptable if it fails to meet the following final product requirements:

1) any single instance of critical foreign matter occurs; or

2) the total number of sample units found defective for taint, decomposition or unwholesomeness, individually or in combination, exceeds the acceptance number for the sample size designated in the sampling plans; or

3) the total number of sample units found defective for decomposition exceeds the acceptance number shown in parentheses for the sample size designated in the sampling plans; or

4) the total number of sample units found defective for standards of identity (colour, style of presentation) exceeds the acceptance number for the sample size designated in the sampling plans.