# SECTION I

# RECEIPT, EXAMINATION, HANDLING AND STORAGE OF RAW FISH

The quality of the raw fish is one of the most important factors in determining the quality of the finished product. If the raw product is of inferior quality, it is not possible for the canned product to be of high quality. Each step in processing has the potential to lower the quality; none can raise it.

***GMP 1.1*** ***Each delivered shipment of raw or frozen tuna shall be inspected to determine its condition and quality. The condition of the fish shall be noted on receipt. The name of the supplier, the temperature and appearance of the fish and the number of rejects (smashed, sours, decomposed) shall be recorded on a suitable report.***

***GMP 1.2*** ***Each lot of raw fish shall be graded. A lot shall be rejected if it fails to meet guidelines for acceptable quality. Rejected lots and individual rejected fish shall be removed from the area; they shall not be further processed for human food.***

*Grading frozen whole tuna*

*Frozen tuna*

*Frozen Tonggol*

***REASON***

Since the quality of the final product depends upon the quality of the raw material, each delivered shipment of raw or frozen tuna shall be inspected and graded to determine its condition so that no tainted, decomposed, or unwholesome tuna are utilized, and to ascertain if all fish have been handled in a clean and sanitary manner.

It is essential that records of the quality of the fish in each shipment be maintained in order to identify lots which may not meet specifications.

Records of the quality and condition of the shipment, containing the following information, are made and kept for a period not less than 3 years after the shipment has been processed:

a) species,
b) date of receipt of shipment,
c) name of supplier,
d) name of delivery vessel or transport company,
e) the average temperature of the fish,
f) the grade of each fish inspected as per the Raw or Frozen Whole Tuna Grade Standard, including the reason or reasons for such grade, and
g) the lots of final products identified by can codes which were produced from the particular lot of raw material.

NOTE: Culling of reject fish from a lot may be permitted in processing areas at the discretion of an Inspector, provided the rejected lots and individual rejected fish are physically segregated and there is no possibility that they can be combined with tuna of acceptable quality that is being thawed, butchered, or otherwise prepared for processing.

Grade standards for whole or butchered tuna intended for processing are given in Table 1, and a sampling plan is given in Chapter 2.

**Table 1**

**GRADE STANDARD**
**WHOLE OR BUTCHERED TUNA INTENDED FOR PROCESSING**

Grades are assigned to each sample unit examined using the combination of factors given below. The assigned grade cannot be higher than the lowest grade for any of the grading factors. Table 3 describes a sampling plan. The grade(s) assigned to the lot are determined by the percentage of each grade of the sample units in the lot. A lot of fish shall be rejected if the number of reject fish exceeds the acceptance number in Table 3. A reject lot may be culled and is subject to re-inspection.

| *Grade Factors* | *Grade 'A' or '1'* | *Grade 'B' or '2'* | *Grade 'C' or '3'* | *Reject* |
|---|---|---|---|---|
| ODOUR Belly cavity and cut through flesh at nape | Fresh characteristic odours. | No odour. | Slightly stale odour or uncharacteristic odours not associated with taint or decomposition. | Any detectable odour associated with taint or decomposition such as ammonia, bilge, sour. |
| BELLY CAVITY Internal organs and belly wall | Smooth, bright, no evidence of burn; organs bright, firm, characteristic colour. | Slight burn, slightly rough peritoneum; organs slightly soft with loss of lustre, red discolouration evident. | Breakdown of belly wall, no holes to skin, excessively rough peritoneum; organs bleached and soft; 10% of belly wall affected by protruding bones; cracks if bent 90°. | Burns through to skin, greater than 10% of belly wall has protruding bones; organs show liquifaction, and/or grey or green colours evident. |
| PHYSICAL DAMAGE Edible portion of fish | No evidence of mutilation or damage. | Slight mutilation or deformation; no evidence of splitting. | Slight splitting; less than 10% of fish slightly smashed or broken to expose muscle. | Greater than 10% of the fish is split, smashed or mutilated to expose muscle. |
| TEXTURE | Firm and elastic. | Slightly soft. | Soft. | Excessively soft and mushy. |
| EYES | Clear, bright, protruding. | Sunken, cloudy-white or reddish. | Sunken, dull white or red. Center of eye liquified. | Not assigned. |
| SKIN | Characteristic lustre and colour, clear and bright. | Dull colour. | Absence of characteristic colour and lustre; breaks in skin. | Gross discolouration of skin, skin decomposed, broken with decomposed muscle visible. |
| GILLS | Characteristic odour and blood red appearance. | No odour; pale red to brown red colour. | Uncharacteristic odours not associated with taint or decomposition; dark brown to yellow brown colour. | *Grade 'D' or '4'* |
| | | | | Detectable odours associated with taint and decomposition; white-yellow colour and slimy appearance. |

***GMP 1.3 On receipt, fish shall be tested for mercury, histamine and other chemical parameters related to safety and quality***

***REASON***

Histamine is formed through the action of naturally occurring spoilage bacteria on the histidine in tuna. Histamine, when ingested in sufficient quantities, may give rise to "scombroid poisoning". Heavy metals such as mercury, if present in amounts exceeding permissible levels, can pose a severe health threat. These tests are necessary to ensure the health and safety of the consumer.

Official methods and some methods and developed and modified by Thailand are given in Chapter 5.

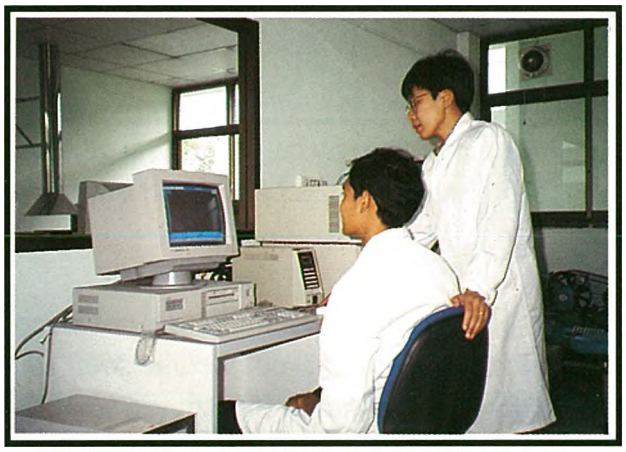
***GMP 1.4 Fish which are in transit to the cold storage area shall be protected from the elements by appropriate covers on the shipping containers, and must be moved to cold storage as quickly as possible in order to keep surface thawing to a minimum.***

***REASON***

This is necessary to prevent premature thawing between unloading and delivery to the plant, which could result in quality deterioration of the fish.

*Raw material in cold storage*

*Collection of samples for raw material quality evaluation*



*Determination for histamine using Fluorometer*

*Determination for mercury using mercury analyser*

***GMP 1.5 Fish in storage shall be properly stored in sanitary containers and identified within the storage area according to the date it entered storage.***

*Storage of fish in stainless steel bins*

***REASON***

This will ensure that tuna storage containers do not become a source of contamination and that stored tuna is processed as soon as possible, so that freeer burn, rancidity development and, in general, quality deterioration is minimized.

***GMP 1.6 Rooms in which frozen fish are stored shall be maintained at a temperature of -18°C or colder, providing that the storage time of the fish is no longer than 3 months.***

***REASON***

Temperature fluctuations will adversely affect the quality of frozen fish. Automatic temperature recorders are highly recommended.