



**THAI AGRICULTURAL STANDARD**

**TAS 7014-2005**

**QUICK FROZEN FISH FILLETS**

**National Bureau of Agricultural Commodity and Food Standards**

**Ministry of Agriculture and Cooperatives**

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Quick frozen fish fillets are one of the important fishery products of Thailand. Currently, the manufacturing of quick frozen fish fillets for domestic market and for export is continuously increasing. It is deemed necessary for the Ministry of Agriculture and Cooperatives to establish Thai Agricultural Standard for Quick Frozen Fish Fillets for the manufacturers to use as the guidelines to produce safe and quality products for consumers.

This standard is established by using the following documents as the guidelines:

FAO/WHO. 1995. Codex Alimentarius Volume 1A. General Requirements, Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Rev.1-1991) Joint FAO/WHO Food Standard Programme, FAO, Rome. 23-31

FAO/WHO. 2001. Codex Alimentarius Volume 1B. General Requirements, Recommended International Code of Practice General Principles of Food Hygiene (CAC/RCP 1-1969, Rev.3-1997, Amd. 1999) Joint FAO/WHO Food Standard Programme, FAO, Rome. 1-29

FAO/WHO. 2001. Codex Alimentarius Volume 9A. Fish and Fishery Products. Codex Guidelines for Sensory Evaluation of Fish and Shellfish in Laboratories (CAC-GL 31-1999) Joint FAO/WHO Food Standard Programme, FAO, Rome. 115-140

FAO/WHO. 2001. Codex Alimentarius Volume 9A. Fish and Fishery Product. Codex Standard for Quick Frozen Fish Fillets (CODEX STAN 190-1995) Joint FAO/WHO Food Standard Programme, FAO, Rome. 3-8

***Remark:***

The standard title has been revised from “Thai Agricultural Commodity and Food Standard (TACFS)” to “Thai Agricultural Standard (TAS)” in accordance with the enforcement of the Agricultural Standards Act B.E. 2551 (2008).



**NOTIFICATION OF THE NATIONAL COMMITTEE ON  
AGRICULTURAL COMMODITY AND FOOD STANDARDS  
SUBJECT: THAI AGRICULTURAL COMMODITY AND FOOD STANDARD:  
QUICK FROZEN FISH FILLETS**

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The resolution of the 2/2548 session of the National Committee on Agricultural Commodity and Food Standards dated 29 August B.E. 2548 (2005) endorsed the Thai Agricultural Commodities and Food Standards entitled Quick Frozen Fish Fillets. This standard would be of benefits for quality improvement, facilitating trade and protecting consumers.

By virtue of the Cabinet Resolution on Appointment and Authorization of the National Committee on Agricultural Commodity and Food Standards dated 19 November B.E. 2545 (2002), the Notifies on Thai Agricultural Commodity and Food Standard entitled Quick Frozen Fish Fillets is hereby issued as voluntary standard, the details of which are attached herewith.

**Notified on 29 September B.E. 2548 (2005)**

Khunying Sudarat Keyuraphan  
Minister of Agriculture and Cooperatives  
Chairperson of the National Committee on Agricultural Commodity and Food Standards



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# THAI AGRICULTURAL STANDARD

## QUICK FROZEN FISH FILLETS

### 1 SCOPE

This standard applies to quick frozen fish fillets for direct consumption. It does not apply to products intended for further processing or for other industrial purposes.

### 2 DESCRIPTION

#### 2.1 Product Definition

2.1.1 Fish fillet means slices of fish of irregular size and shape which are removed from the carcass by cuts made parallel to the backbone and pieces of such fillet, with or without the skin.

2.1.2 Quick frozen fish fillet mean slices of fish of irregular size and shape which are removed from the carcass of the same species of fish suitable for human consumption by cuts made parallel to the backbone and sections of such fillets cut so as to facilitate packing, and further quick frozen process.

#### 2.2 Process Definition

2.2.1 The quick frozen processing means the freezing carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The product after any suitable preparation shall be subjected to a freezing process and shall comply with the conditions laid down hereafter. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ) or lower at the thermal centre after thermal stabilization.

2.2.2 The quick frozen fish fillet processing means the fish fillet in 2.1.1 taken to further process in 2.2.1 where the process and packaging shall minimize dehydration and oxidation. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution.

The recognized practice of repacking quick frozen products under controlled conditions shall maintain the quality of the product, followed by the reapplication of the quick freezing process as defined, where necessary.

#### 2.3 Presentation

2.3.1 Any acceptable product shall meet all requirements of this standard

2.3.2 Information of product is adequately described on the label to avoid confusing or misleading the consumer.

2.3.3 Type of the product shall be described such as “fish fillet with the skin or fish fillet without the skin.”

2.3.4 Fish fillets may be presented as boneless, provided that boning has been completed including the removal of pin-bones.

### 3 ESSENTIAL COMPOSITION AND QUALITY FACTORS

#### 3.1 ESSENTIAL COMPOSITION

##### 3.1.1 Fish

Quick frozen fish fillets shall be prepared from sound fish which are of a quality fit to be sold fresh for human consumption.

##### 3.1.2 Glazing

If glazed, the water used for glazing or preparing glazing solutions shall be of potable quality or shall be clean sea-water. Potable water is fresh-water fit for human consumption. Standards of potability shall not be less than those contained in the latest edition of the Ministry of Public Health Declaration "Potable Water". Clean sea-water is sea-water which meets the same microbiological standards as potable water and is free from objectionable substances.

##### 3.1.3 Other Ingredients

All other ingredients used shall be of food grade quality.

#### 3.2 QUALITY FACTORS

##### 3.2.1 Decomposition

The products shall not contain more than 10 mg/100 g of histamine based on the average of the sample unit tested. This shall apply only to species of *Clupeidae*, *Scombridae*, *Scombresocidae*, *Pomatomidae* and *Coryphaenidae* families.

##### 3.2.2 Defects

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

###### (1) Dehydration

Greater than 10% of the surface area of the sample unit or for pack sizes described below, exhibits excessive loss of moisture clearly shown as white or yellow abnormality 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 product.

| <u>Pack Size</u>      | <u>Defect Area</u>         |
|-----------------------|----------------------------|
| a) $\leq$ 200 g units | $\geq$ 25 cm <sup>2</sup>  |
| b) 201-500 g units    | $\geq$ 50 cm <sup>2</sup>  |
| c) 501-5000 g units   | $\geq$ 150 cm <sup>2</sup> |



**(2) 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 and sanitation practices.

**(3) Parasites**

The presence of two or more parasites per kg of the sample unit detected by the method described in 9.2.1.2 with a capsular diameter greater than 3 mm or a parasite not encapsulated and greater than 10 mm in length.

**(4) Bones (in packs designated boneless)**

More than one bone per kg of product greater or equal to 10 mm in length, or greater or equal to 1 mm in diameter;

A bone less than or equal to 5 mm in length, is not considered a defect if its diameter is not more than 2 mm.

The foot of a bone (where it has been attached to the vertebra) shall be disregarded if its width is less than or equal to 2 mm, or if it can easily be stripped off with a fingernail.

**(5) Odour and Flavour**

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

**(6) Flesh Abnormalities**

A sample unit affected by excessive gelatinous condition of the flesh together with greater than 86% moisture found in any individual fillet or a sample unit with pasty texture resulting from parasitic infestation affecting more than 5% of the sample unit by weight.

In the determination of the defectives, products will be considered as meeting the requirements of this standard when lots examined in accordance with section 10. Products shall be examined by the methods given in Section 9.

**4 FOOD ADDITIVES**

| <b><u>Additive</u></b>                        | <b><u>Maximum level in the final product</u></b>  |
|---|---|
| <b><u>Moisture/Water Retention Agents</u></b> |   |
| Monosodium orthophosphate                     | 5000 mg/kg expressed as P <sub>2</sub> O <sub>5</sub> , singly or in combination (includes natural phosphate) |
| Monopotassium orthophosphate                  |   |
| Tetrasodium diphosphate                       |   |
| Tetrapotassium diphosphate                    |   |
| Pentasodium triphosphate                      |   |
| Pentapotassium triphosphate                   |   |
| Sodium polyphosphate                          |   |
| Calcium, polyphosphates                       |   |
| Sodium alginate                               | GMP   |
| <b><u>Antioxidants</u></b>                    |   |
| Sodium ascorbate                              | GMP   |
| Potassium ascorbate                           | GMP   |

## 5 CONTAMINANTS

In compliance with the provisions of the relevant laws and requirements under the Thai Agricultural Standard on Contaminants.

## 6 VETERINARY DRUG RESIDUES

In compliance with the provisions of the relevant laws and requirements under the Thai Agricultural Standard on Residues of Veterinary Drug in Foods

## 7 HYGIENE

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

7.2 Microbial counts shall be within the limit as described below. Analytical methods are according to Section 9.2.3 of this standard.

### (1) Total viable counts

Total viable counts shall not exceed  $5 \times 10^5$  CFU/g of product and the number of samples with total viable counts within  $5 \times 10^5$ - $10^7$  CFU/g of product shall not exceed 3 out of 5.

### (2) *Escherichai coli*

The Most Probable Number (MPN) of *Escherichai coli* shall not exceed 10/g of product and the number of samples with MPN of *Escherichai coli* within 10-100/g of product shall not exceed 3 out of 5.

### (3) *Staphylococcus aureus*

The Most Probable Number (MPN) of *Staphylococcus aureus* shall not exceed 100/g of product.

### (4) *Salmonella* spp.

*Salmonella* spp. shall not be found in 25g of product.

### (5) *Vibrio cholerae*

*Vibrio cholerae* shall not be found in 25g of product.

### 7.3 Histamine

The product shall not contain histamine that exceeds 20 mg/kg. This applies only to species of *Clupeidae*, *Scombridae*, *Scombresocidae*, *Pomatomidae* and *Coryphaenedae* families.

7.4 The product shall not contain any other substance amounts which may pose a hazard to human health.

7.5 The products covered by this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice-General Principles of Food Hygiene (CAC/RCP 1-1969), relevant laws and Thai Agricultural Standard (TAS 7410) entitled Code of Practice for Fish and Fishery Products

## **8 LABELLING**

### **8.1 LABELLING OF RETAIL CONTAINERS**

Code, marking and detail information's shall be legibly appeared on the container in such a way that they shall not mislead the consumers. The following specific provisions shall be applied.

8.1.1 The name of the product as declared on the label shall be "...fillets" or "fillets of..." and "quick frozen..." or "frozen...".

8.1.2 Products shall be designated as fish fillet with or without the skin, or boneless as relevant.

8.1.3 Net weight shall be declared in gram or kilogram.

8.1.4 Where the food has been glazed the declaration of net contents of the food shall be exclusive of the glaze.

8.1.5 If the product has been glazed with sea-water, a statement to this effect shall be made.

8.1.6 Expiring and manufacturing dates.

8.1.7 Name and address of manufacturer, packer for local product, OR name and address of importer and country of origin as the case may be.

8.1.8 Lot identification

8.1.9 Storage instruction. The label shall include terms to indicate that the product shall be stored at a temperature of  $-18^{\circ}\text{C}$  or colder including transportation and distribution.

### **8.2 LABELLING OF NON-RETAIL CONTAINERS**

Information under the provisions of 8.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer as well as storage instructions, shall appear on the container.

However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

## 9 SAMPLING, EXAMINATION AND ANALYSES

### 9.1 SAMPLING

9.1.1 Sampling of lots for examination of the product shall be in accordance with relevant laws and requirements of the Thai Agricultural Standard on Sampling Method. The sample unit may be a primary container with at least a 1 kg portion of the sample unit.

9.1.2 Sampling of lots for examination of net weight shall be carried out in accordance with relevant laws and requirements of the Thai Agricultural Standard on Sampling Method.

### 9.2 ANALYTICAL METHODS

#### 9.2.1 Sensory and Physical Examination

Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with procedures elaborated in Sections 9.2.1.1 through 9.2.1.4, and the Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories (CAC/GL 31 - 1999).

##### 9.2.1.1 Determination of Net Weight

###### (1) Determination of net weight of 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.

###### (2) Determination of net weight of products covered by glaze procedure

As soon as the package is removed from low temperature storage, open immediately and place the contents under a gentle spray of cold water. Agitate carefully so that the product is not broken. Spray until all ice glaze is removed. Remove adhering water by the use of paper towel and weight the product in a tared pan.

##### 9.2.1.2 Procedure for the Detection of Parasites in Skinless Fillets

The entire sample unit is examined non-destructively by placing appropriate portions of the thawed sample unit on a 5 mm thick acryl sheet with 45% translucency and candled with a light source giving 1500 lux 30 cm above the sheet or other equivalent methods.

##### 9.2.1.3 Determination of Gelatinous Condition

According to the AOAC Methods - "Moisture in Meat and Meat Products, Preparation of Sample Procedure"; 983.18 and "Moisture in Meat" (Method A); 950.46. or other equivalence method.

##### 9.2.1.4 Cooking Methods for sensory and physical examination to confirm odour, flavour and defectives under Annex A.

The following procedures are based on heating the product to an internal temperature of 65 - 70°C. The product shall not be overcooked. Cooking times vary according to the size of the product and the temperatures used. The exact times and conditions of cooking for the products shall be determined by prior experimentation.

**Baking Procedure:** Wrap the product in aluminum foil and place it evenly on a flat cookie sheet or shallow flat pan.

**Steaming Procedure:** Wrap the product in aluminum foil and place it on a wire rack suspended over boiling water in a covered container.

**Boil-in-Bag Procedure:** Place the product in a boilable film-type pouch and seal. Immerse the pouch in boiling water and cook.

**Microwave Procedure:** Enclose the product in a container suitable for microwave cooking. If plastic bags are used, check to ensure that no odour is imparted from the plastic bags. Cook according to equipment instructions.

#### 9.2.2 Chemical Examination

(1) Determination of histamine According to the AOAC Methods 977.13 latest edition or other equivalent methods.

(2) Determination of Phosphate According to the AOAC Methods (1984) 2.021 57 to 2.025 latest edition or any other equivalent methods.

#### 9.2.3 Analytical Methods for Micro-Organisms

According to USFDA/BAM (Bacteriological Analytical Manual) latest edition or any other equivalent methods.

## 10 LOT ACCEPTANCE

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

10.1 The total number of "defectives" as classified according to Section 3.2.2 does not exceed the acceptance number (c) of the appropriate sampling plan in the Section 9

10.2 The average net contents of all containers examined is not less than the declared weight, provided there is no unreasonable shortage in any containers;

10.3 The Food Additives, Hygiene and Handling and the Labelling requirements of Sections 4, 5, 6, 7 and 8 are met.

## ANNEX A

### Sensory and Physical Examination

1. Complete net weight determination, according to defined procedures in Section 9.2.1.1 (deglaized as required).
2. Examine the frozen fillets for the presence of dehydration by measuring those areas which can only be removed with a knife or other sharp instrument. Measure the total surface area of the sample unit, and calculate the percentage affected.
3. Thaw and individually examine each fillet in the sample unit for the presence of foreign matter, parasites, bone where applicable, odour, and flesh abnormality defects.
4. In cases where a final decision on odour cannot be made in the thawed uncooked state, a small portion of the disputed material (approximately 200 g) is sectioned from the sample unit and the odour and flavour confirmed without delay by using one of the cooking methods defined in Section 9.2.1.4
5. In cases where a final decision on gelatinous condition cannot be made in the thawed uncooked state, the disputed material is sectioned from the product and gelatinous condition confirmed by cooking as defined in Section 9.2.1.4 or by using the procedure in Section 9.2.1.3 to determine if greater than 86% moisture is present in any fillet. If a cooking evaluation is inconclusive, then the procedure in 9.2.1.3 would be used to make the exact determination of moisture content.

## ANNEX B-1

### Contaminants

In Compliance with the provisions of the relevant laws and regulations in particular the latest version.

Contaminations shall not exceed the following limits

- (1) Lead (Pb) shall not exceed 1 mg/ 1 kg of food<sup>1</sup>
- (2) Mercury (Hg) shall not exceed 0.5 mg/ 1 kg of food (for sea food)<sup>1</sup>
- (3) Cadmium (Cd) shall not exceed 0.2 mg/ 1 kg of food<sup>2</sup>

Source: 1. Ministry of Public Health Notification Number 98 (1986) on Food Standard on Contaminants.  
2. Department of Fisheries, 2004, Fishery Products Standard Part 1 Chemical Reference Criteria for Frozen Fishery Products

**ANNEX B-2****Veterinary Drug Residue**

In compliance with the provisions of relevant laws and regulation on standards in particular the latest.

| <b>Order</b> | <b>Kind of drug residue</b>                       | <b>Maximum residue limit, MRL<br/>(µg/kg of organ or product)</b> |
|--------------|---|---|
| 1.           | Oxytetracyclines/expressed<br>as oxytetracyclines | 200 <sup>(1)</sup>  |

- Source:
1. Ministry of Public Health Notifications Number 231 (2001) on Veterinary Drug Residue in Food.
  2. Codex Alimentarius. 2003. MRLs for Veterinary Drug in Food (CAC/MRL) update as at 20<sup>th</sup> Session of the Codex Alimentarius Commission.



## ANNEX B-3

### Sampling and Decision Criteria

In compliance with the provisions of the relevant laws and regulations in particular the latest version.

#### 1. Defectives

The total number of "defects" shall not exceed the acceptance numbers (c) of the appropriate sampling plan.

**Sampling Plan**

| Lot size      | Sampling size (n) | Acceptance (c) |
|---------------|-------------------|----------------|
| 200 or less   | 3                 | 0              |
| 201 – 800     | 6                 | 1              |
| 801 – 1,600   | 13                | 2              |
| 1,601 – 2,400 | 21                | 3              |
| 2,401 – 3,600 | 29                | 4              |
| Over 3,600    | 38                | 5              |

A sample unit may be a primary container at least a 1 kg portion of the sample unit.

#### 2. Microorganism and Food additives<sup>1</sup>

2.1 Random sampling shall be carried out with 5 samples per lot.

2.2 The remaining samples microorganism shall be used in the determination of food additives. For the determination of food additives, take the remaining samples of from each box or parcel at least 50 g. Thoroughly grind the sample and consequently use for the determination of food additives.

2.3 All results shall conform to Section 7.2 and Section 4 of this standard.

#### 3. Veterinary drug residues<sup>2</sup>

3.1 Random sampling shall be carried out by collect 12 subsamples . Minimum subsample size is 1 kg.

3.2 Minimum quantity required for laboratory sample is 1000 g

3.3 All results shall conform to Section 6 of this standard.

Source: 1. Thai Industrial Standard Institute, B.E.2529 (1986). *Industrial Standards: Quick Frozen Fish Fillet*, TIS 616-2529 (1986), Ministry of Industry, Bangkok.

2. Codex Alimentarius Volume 3. Residues of Veterinary Drugs in Foods. Codex Guidelines for the Establishment of a Regulatory Programme for Control of Veterinary Drug Residues in Foods (CAC/GL 16-1993) Joint FAO/WHO Food Standard Programme, FAO, Rome.

## ANNEX C

## Unit

Units and symbols used in this standard are based on the International System of Units or *Le Système International d' Unités* which is widely acceptable:

| <b>Symbols</b>  | <b>Units</b>           |
|-----------------|------------------------|
| °C              | degree Celsius         |
| cm              | centimeter             |
| cm <sup>2</sup> | square centimeter      |
| g               | gram                   |
| kg              | kilogram               |
| lux             | illumination           |
| ml              | milliliter             |
| mg              | milligram              |
| mg/kg           | milligram per kilogram |
| mm              | millimeter             |
| µg              | microgram              |