



## Agenda Item 12

CX/FFP 14/33/14

### JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON FISH AND FISHERY PRODUCTS

Thirty-third Session  
Bergen, Norway  
17 – 21 February 2014

#### CODE OF PRACTICE FOR FISH AND FISHERY PRODUCTS (OPTIONAL FINAL PRODUCT REQUIREMENTS FOR COMMODITIES)

Comments submitted by Algeria, Egypt, European Union, Japan, Kenya, Norway and Uruguay

#### ALGERIA

##### **Appendix I Modified Atmosphere Packaging**

###### First comment:

Still missing is a brief outline of the pros and cons of the MAP process by comparing it with the other preservation techniques.

###### Second comment:

Gases used for the MAP process are defined in Directive 2008/84/EC and the composition of ambient air is 20.9% O<sub>2</sub> / 78% N<sub>2</sub> and 0.03 CO<sub>2</sub>. It is thus necessary to specify the gas composition intended for each type of fish (white fish, oily fish) taking into consideration the fat content of fish, the type of packaging material and the storage time.

##### **Appendix III Optional final product requirements for fresh, frozen and minced fish**

###### First comment:

Before listing any requirements, it would be useful to recall the definition of final product requirements for fresh, frozen and minced fish.

###### Second comment:

Before determining the descriptions of potential defects for final products for fresh, frozen and minced fish, it would be preferable to describe the normal state of the product without defect (name of the product, important characteristic of the product, listing all the product descriptions in the normal state), this will facilitate the identification of potential defects and will help the buyer and the dealer at the time of commercial transactions.

##### **Appendix V Optional final product requirements - Coated quick frozen fishery products**

###### Comment:

Quick frozen fishery products include **finfish** (saltwater fish, freshwater fish), **molluscs** (shellfish, cephalopods and similar seafood) as well as **crustaceans** (shrimp, crayfish, crabs),...

It would thus be preferable to add a column in Appendix V to identify groups of water based products, as follows:

Type of product	Group of fish			Defect	Recommended description
	Finfish	Molluscs	Crustaceans		
	Saltwater fish:	Shellfish:	Shrimp:		
	-	-	-		
	-	-	-		
	-	-	-		
	Freshwater fish:	Cephalopods:	Crayfish:		
			-		
			-		
			-		
			Crabs:		
			-		
			-		
			-		
			-		

**N.B:** Replace **Type of product** with **state of fish**.

#### **Appendix VI Optional final product requirements – Salted fish**

##### Comment:

For the optional final product requirements – Salted fish, we need to identify:

- The category of the **quality of salt** used to produce salted fish;
- The **salt content** by fish classification (imperial/superior, universal/popular);
- The content identification label.

#### **EGYPT**

#### **Appendix IX – Optional Product Requirements – Shrimps & Prawns**

Egypt proposes that:

**Second quality:** 80 to less than 90 instead of 89 to 80

**Odour:** the term yodoform is not clear. It would be appreciated receiving more explanation regarding this term.

**Canned fish** – Egypt doesn't agree with the presented document and proposes that the drained weight of fish shall not be less than 70% for all.

**Canned sardines and sardine-type products** - Egypt agrees with the presented document.

**Canned tuna and bonito** – Egypt proposes that item 8.2 Odours / Flavour

8.2 A sample unit affected or rancidity of either fish flesh or filling medium

8.3 texture – Egypt proposes to add on a new item (iv) sticky or clammy flesh texture.

Canned salmon – Egypt proposes the following:

Defect

a) Appearance

(III) the oil and liquid released or added during prising are abnormal.

#### **Canned shrimps or prawns**

Egypt proposes the following amendment:

A sample unit affected by distinct blackening or any abnormal discoloration or more than 10% to be considered as a defect.

## **EUROPEAN UNION**

### **General comment**

Before the CCFFP agreed to transfer these Appendices to the Code of Practice, they were an important part of the Standards for fish and fishery products to describe in detail quality aspects. From the MSEU point of view, these quality parameters and characteristics for fish and fishery products are particularly relevant. Therefore, the MSEU consider that the Appendices should be retained and completed, as required, because they are an important tool for international trade. The MSEU believe that if these special quality requirements in fishery products are not retained, trade problems may arise because different countries may have different quality concepts about certain fishery products.

Many countries and particularly developing countries rely on Codex standards and related texts to produce safe and high quality fish and fishery products. For example, about 50% of the seafood exported to USA, Japan and EU is from developing countries.

### **Specific comments**

#### **Appendix III – optional final product requirements – fresh, frozen and minced fish**

In point 1.1 (Quick frozen finfish, uneviscerated and eviscerated) the dehydration of the surface should be taken into account by analogy to points 1.2 and 1.3 (Quick frozen fish fillets or quick frozen blocks of fish fillet, minced fish flesh and mixtures of fillets and minced fish flesh).

The MSEU suggest adding the following:

**“Moderate Dehydration** – a loss of moisture from the surface of the sample unit, which is colour masking, but does not penetrate the surface and can be easily removed by scraping.

Over 10% of the total surface or Pack Size Defect Area:

- a) <200 g units > 25 cm<sup>2</sup>
- b) 201 - 500 g units > 50 cm<sup>2</sup>
- c) 501 - 5000 g units > 150cm<sup>2</sup>
- d) 5001 - 8000 g units >300cm<sup>2</sup>
- e) 8000 g units >500 cm<sup>2</sup>

#### **APPENDIX IV – OPTIONAL FINAL PRODUCT REQUIREMENTS -FROZEN SURIMI**

##### **1.1.1 Moisture**

The unit of the Pre-dry weight in the denominator should be expressed in [g]. The moisture parameter should be multiplied by 100 in order to express it as a percentage.

Pre-dry weight (g) - After-dry weight (g)

Moisture (%)= ————— \* 100  
Pre-dry weight (g)

##### **1.2 Cooked Surimi Gel Tests**

###### **1.2.1.1 Puncture Test**

**There are two additional methods, which may be used in determination of surimi quality.**

1. The Compression Test, commonly used in surimi industry, conducted with the Texture Analyser apparatus.

The test measures the gel strength and deformability of the sample of surimi gel using a spherical pin of which the diameter is 5 mm and gives the penetration force in g and the deformation in mm at breakage.

Typical T.A setting product parameters:

Pre-Test Speed: 1,0 mm/sec

Test Speed: 1,1 mm/sec

Points per second: 500

Post-Test Speed: 10,0 mm/sec

Probe: P/5S: 5ram SP1IF.RICAL STAINLESS

Distance: 15,0 mm

Load Cell Capacity: 5000g

Trigger Force: 20,0 g

2. Texture Profile Analysis (TPA) has been widely used in determination of surimi quality as well. There are many scientific articles describing usage of this test in the area of surimi production (list of selected research papers in the TPA Annex). TPA involves compression of the piece of food to 25% of its original height (75% of compression) two times in reciprocating motion. The textural attributes of hardness, cohesiveness, springiness, gumminess, chewiness and resilience were then calculated from the curve force-time.

#### **2.1.4 Crude Fat Content**

"S" in the denominator of the calculation of crude fat content should be expressed as weight of the sample taken (g), not quantity of the sample taken (g).

#### **2.2.2.2 Expressible Moisture**

The calculations of the expressible water and water holding capacity should be multiplied by 100 in order to express them as a percentage (See the comment to point 1.1.1).

### **APPENDIX V – OPTIONAL FINAL PRODUCT REQUIREMENTS -COATED QUICK FROZEN FISHERY PRODUCTS**

The MSEU propose to replace in the second column of the table in the **Spanish version** the term "*peligro*" with "*defecto*".

### **APPENDIX VI – OPTIONAL FINAL PRODUCT REQUIREMENTS - SALTED FISH – [PART 1, ALREADY ADOPTED, REST TO BE COMPLETED]**

#### **Quality classification**

**Imperial / Superior** - Fish without defects, according to a thorough description of defects mentioned in the defect list below.

**Universal** - Fish broken, amputee or with defects from a) to f) of the defect list below.

**Popular** - Fish with the characteristics of universal classification, but with a higher severity in the accepted defects.

**Salted fish with defects listed from g) to o) is not fit for human consumption.**

#### **Definition of defects**

- a) Split with amputations, with removal of the entire backbone of the fish or without removal of its anterior two-thirds;
- b) Deep cracks in the anterior two thirds of the fish, with depth corresponding to or exceeding half the thickness of the fish;
- c) Cracks not deep affecting more than 15% of fish in the area bounded continuously or more than one third of the total surface of the fish;
- d) Blood clots and blood spots or liver affecting more than 5% of the surface of the fish;
- e) Clavicular bone exposed, with tearing of the muscle;
- f) Excess of salt adherent to dried fish and or mucus in the dorsal, as a result of an inadequately washed or rinsing the wet salted fish;
- g) Deficient curing - when the ratio between the concentrations of sodium chloride and water in the tissue is less than 0.32 or greater than 0.37;

- h) Burning - fish showing sticky on the back side with disordered texture resulting from excess heat;
- i) Red - caused by the existence of halophilic bacteria;
- j) Dun - caused by the existence of halophilic mould clusters;
- k) Distinctly unpleasant smell, not characteristic of the species or the type of treatment;
- l) Unusual colouring - uncharacteristic colour stains or staining, around the fish, which is not due to the technological process of manufacture;
- m) Ressoado - defective conservation fish resulting from deficient storage temperature and aeration, which causes the rotting of fatty tissue with total disorganization of the texture of the fish - looks cooked;
- n) Presence of foreign matter;
- o) Visible parasites.

The MSEU consider that the proposed defects are precise, objective and simplify the understanding and the limits to the operators.

#### **APPENDIX VIII – OPTIONAL PRODUCT REQUIREMENTS - LOBSTERS AND CRABS**

The MSEU propose the following amendment in the **Spanish version**. In the first column of Quick Frozen Lobsters section it is suggested to replace “*peligro*” by the word “*defecto*”.

#### **APPENDIX XI – OPTIONAL FINAL PRODUCT REQUIREMENTS CANNED FISH**

##### **2. Canned sardines and sardine-type products**

Recommended defect description in the field of appearance “(vi) *The packing medium is not of normal colour and consistency for the type*” is not clear. Maybe it should be expressed as “*The contents of the can/container ...*”

#### **JAPAN**

Japan would like to submit general comments on the Appendices for Optional Final Product Requirements for commodities in the Code of Practice of Fish and Fishery Products (CAC/RCP 52-2003).

From Japan’s point of view, the optional requirements on final products should not be included in the Code of Practice or standards.

Japan believes that Codex text should basically focus on protecting the health of consumers and ensuring fair practices in the food trade. The proposed optional requirements on final products are relating to the detail on defects of commercial nature, not to consumer protection in terms of food safety.

If the Committee agrees development of appendices, the work “optional” should be deleted from the appendices. “Optional” does not make a difference on the nature of texts. As pointed out in the document (CL 2013/27-FFP), there is no difference between a Codex standard and other Codex texts including codes of practice in TBT definition. All Codex texts, including standards and their annexes, are covered by the TBT definition of “standard”.

#### **KENYA**

#### **APPENDIX IV: OPTIONAL FINAL PRODUCT REQUIREMENTS - FROZEN SURIMI**

##### **A. *Comminution***

##### **Comment**

Warm water species may be processed at a slightly higher temperature (not to exceed  $\pm 5^{\circ}\text{C}$ ) **100°C** and below. However, better quality will be achieved at a lower temperature.

#### **APPENDIX VI**

#### **OPTIONAL FINAL PRODUCT REQUIREMENTS - SALTED FISH [PART 1, ALREADY ADOPTED, REST TO BE COMPLETED]**

## 1. PRODUCT DESIGNATION OF SALTED FISH OF GADIDAE FAMILY

### GENERAL COMMENT:

We went through the optional appendices and noted that the characteristics given herein are very subjective and not measurable. Some parameters are not qualifying for superior grades.

#### **Quality classification**

**We propose to modify number 5 as stated below**

#### *Imperial/superior*

Fish products in this trade category are made from fish that is thoroughly bled, well washed and rinsed to remove remains of blood and entrails, and with nape skin attached.

The fish is to be properly split and evenly salted, well pressed and restacked during processing. The fish is to be light-coloured and firm, and without blemishes.

This category may include fish with the following characteristics:

1. poorly bled bellies
2. small tears or longitudinal cracks
3. not properly rinsed
4. some blood clots
5. ~~some what unevenly salted~~ **homogeneously salted**

### NORWAY

#### **General comments**

We have two general points we would like to raise:

Firstly, in principle Norway supports removing the appendices for Optional Final Product Requirements from the Code of Practice for Fish and Fishery Products.

*Reason:* Codex texts should focus on protecting consumer health and those essential quality factors, and not on quality issues of commercial nature used between buyers and sellers. Codex documents should also ensure fair practices in the food trade

However, secondly, relevant information in the appendices should be inserted into appropriate sections in the Code of Practice or in relevant standards. See specific comments below.

*Reason:* Fish species and product designation is relevant information to food business operators supplementary to the Codex standard for salted fish and dried salted fish of the Gadidae family of fishes (CODEX STAN 167-1989), which might facilitate trade and should therefore still be included in a Codex text.

Regarding Appendix I - Modified Atmosphere Packing (MAP); we support to continue working on Appendix I as agreed upon at CCFFP 32 session in 2012. At a later stage, we would like to come back to the discussion on whether or not to insert the information on MAP in a specific section of the code or as a separate annex.

#### **Specific comments on Appendix VI - Optional products requirements for salted fish**

We would like to keep the introductory part of Appendix VI and therefore we suggest inserting it into a new paragraph X, in section 11 – processing of salted and dried salted fish in the Code (CAC/RCP 52 – 2003).

**These products specifications describe the optional defects for salted fish. The descriptions of optional defects will assist buyers and sellers in describing those defect provisions. These descriptions are optional and are in addition to the essential requirements prescribed in the appropriate Codex product standards.**

Section 1 *Product designation of salted fish of Gadidae family* could be amended and inserted into a new paragraph XX in section 11 – *processing of salted and dried salted fish* in the Code.

~~Products from the following species~~ **Product designation of salted fish from the mentioned species, all belonging to the Gadidae family with reference to the Codex Standard for salted fish and dried salted fish of the Gadidae family of fishes (CODEX STAN 167-1989), are products** that have been bled, gutted, beheaded and split so that approximately two-thirds of the backbone is removed, washed and fully saturated with salt. Salted fish used for production of dried salted fish shall have reached 95-percent salt saturation prior to drying.

*Reason:* The introductory part of Appendix VI and the Part 1 Product designation of salted fish of Gadidae family are already adopted and in the Code in appendix VI, therefore this is simply a matter of moving already adopted text. See also argument above.

The table in section 1 could be written as sentences in a new paragraph XXX in section 11 - in the Code and also as already done in section 15 - processing of cephalopods.

**This section applies to fresh, salted and dried salted fish of the following species, all belonging to the Gadidae family, Cod (Gadus morhua), Pacific cod (Gadus macrocephalus), Polar cod (Boreogadus saida), Greenland cod (Gadus ogac), Saithe (Pollachius virens), Ling (Molva molva), Blue ling (Molva dypterygia), Tusk (Brosme brosme), Haddock (Gadus aeglefinus/Melanogrammus aeglefinus), Forkbeard (Phycis blennoides and Pollock (Pollachius pollachius) intended for human consumption.**

*Reason:* Relevant information should still be included in a Codex text.

We would like to suggest inserting a new paragraph after the first paragraph of section 11:

New second paragraph:

**This section applies to fresh, salted and dried salted fish of the following species, all belonging to the Gadidae family, Cod (Gadus morhua), Pacific cod (Gadus macrocephalus), Polar cod (Boreogadus saida), Greenland cod (Gadus ogac), Saithe (Pollachius virens), Ling (Molva molva), Blue ling (Molva dypterygia), Tusk (Brosme brosme), Haddock (Gadus aeglefinus/Melanogrammus aeglefinus), Forkbeard (Phycis blennoides and Pollock (Pollachius pollachius) intended for human consumption.**

And after the existing second paragraph (if the text is amended, this will be the third paragraph) we would like to insert the following two new paragraphs (fourth and fifth paragraph):

**Product designation of salted fish from the mentioned species, all belonging to the Gadidae family with reference to the Codex Standard for salted fish and dried salted fish of the Gadidae family of fishes (CODEX STAN 167-1989), are products that have been bled, gutted, beheaded and split so that approximately two-thirds of the backbone is removed, washed and fully saturated with salt. Salted fish used for production of dried salted fish shall have reached 95-percent salt saturation prior to drying.**

**These products specifications describe the optional defects for salted fish. The descriptions of optional defects will assist buyers and sellers in describing those defect provisions. These descriptions are optional and are in addition to the essential requirements prescribed in the appropriate Codex product standards.**

Quality classification can be deleted.

*Reason:* These are not essential for consumer protection or as quality factors, but quality issues of commercial nature used between buyers and sellers.

#### **Specific comments on other appendices in the Code**

Norway has no further comments other than the general comment that the appendices should be removed.

#### **URUGUAY**

Uruguay welcomes the opportunity to submit comments on the points raised in paragraph 4 (Appendices are attached to this Circular Letter as Annex I).

Some comments refer to differences in the words that may be used for the translation, and other comments are suggestions for changes in the text.

The transcribed section goes from Appendix III to 2.1.2 which is the part of the text we wish to comment on.

Comments are highlighted with *red, underlined, italics font*.

Words to be deleted show in ~~strike through font~~ followed by the suggested word to be inserted.

Comment: footnotes to be carried over are not included.

### Appendix III

#### 1.1 Quick Frozen Finfish, Uneviscerated and Eviscerated

##### Defect

##### Recommended Defect Description

a) Body Deformation

Deformation of the back (hump-back) or of the head if present (hooked snout) as a result of the extension of cartilaginous material in these areas as the fish approaches spawning condition.

*Comment from Uruguay: we understand that this defect only applies to salmon*

b) Damage to protective coating

Voids in the ice glaze or tears in the covering membrane

*(TR: proposed change in Spanish wording only).*

c) Surface defects:-

Readily discernible localised ~~discoloration~~ **abnormal colour** caused by diffusion of blood into the flesh.

Discoloration from bruises:

Cuts, wounds and other skin breaks

Easily visible localised ~~discoloration~~ **abnormal colour** caused by diffusion of blood into the flesh.

Readily discernible deviation from the normal characteristic colour of the species concerned.

d) Gutting and cleaning defects

Improper washing

Gill and body cavity cuts

Belly burn or loose belly bones.

Remains of viscera

Misplaced cuts made during gutting.

~~Incomplete removal of the viscera~~ **Incomplete gutting.**

~~Inadequate removal of slime,~~ **Remains of mucus,** blood and bits of viscera from the surface of the fish and from the body cavity.

Readily discernible enzymatic damage to the tissues in the area of the belly cavity, or loose belly bones in the abdominal cavity, which have become detached from the ~~flesh~~ **muscle**.

#### 1.2 Quick frozen fish fillets 5

##### Defect:

##### Recommended Defect Description

a) Moderate Dehydration

A loss of moisture from the surface of the sample unit, which is **alters the colour** ~~masking~~, but does not penetrate the ~~surface~~ **deeply** and can be easily removed by scraping. Over 10% of the total surface area; or

##### Pack size

##### Defect area

a) <200 g units

>25cm<sup>2</sup>

b) 201-500 g units

>50cm<sup>2</sup>

c) 501- 5000 g units

>150cm<sup>2</sup>

d) 5001-8000 g units

>300cm<sup>2</sup>

e) >8000 g units

>500 cm<sup>2</sup>

b) Ragged or torn fillets

Longitudinal edges markedly and excessively irregular. Each instance.

c) Small pieces (not applicable to fillets)

A fillet piece weighing less than 25 g



cut from blocks)

- |  |   |
|--|---|
| d) Skin and <del>black membrane</del> <b>peritoneum</b> (does not include sub-cutaneous layer). In flat fish white skin is not regarded as defect. | Skinless fillets<br>Each piece greater than 3 cm <sup>2</sup>   |
| e) <del>Black Membrane</del> <b>Peritoneum</b> or Belly Lining (does not include white membrane)   | Skin-on fillets<br>Each piece greater than 3 cm <sup>2</sup>  |
| f) Scales:<br>Attached to skin<br>Readily noticeable loose scales  | Skin-on fillets - scaled<br>Each area of scale greater than 3 cm <sup>2</sup><br>Skinless fillets<br>More than 5, or in the case of hake fillets, more than 10 loose scales.  |
| g) Blood Clots (spots)   | Any mass or lump of clotted blood greater than 5 mm in diameter.  |
| h) Bruises & Discoloration   | Diffused blood causing distinct reddish, brownish or other off-coloration. Any aggregate area of <del>discoloration</del> <b>abnormal colour</b> or bruising exceeding 3 cm <sup>2</sup> .  |
| i) Fins or part of fins  | Two or more bones connected by membrane, including internal or external bones, or both in a cluster.<br>Any instance where a bone in the fin exceeds 40 mm in length.   |
| j) Bones   | Any bone greater than or equal to 10 mm in length or with a diameter greater than or equal to 1 mm; any bone greater than or equal to 5 mm in length is not to be considered if the diameter is not greater than or equal to 2 mm. The foot of a bone (where it has been attached to the vertebra) shall be disregarded if its <b>width thickness</b> is less than or equal to 2 mm or if it can be easily stripped off by a finger nail. |
| Critical bone  | Each defect whose maximum profile cannot be fitted into a rectangle, drawn on a flat solid surface, which has a length of 40 mm and a <b>width thickness</b> of 10 mm.  |
| k) Packaging material  | Each instance   |
| l) Viscera   | Each instance of the internal organs  |

### 1.3 Quick Frozen Blocks of Fish Fillet, Minced Fish Flesh and Mixtures of Fillets and Minces Fish Flesh

Defect:

- |   |   |
|---|---|
| a) Block Irregularity (applies only to blocks intended for cutting into cores for fish slices or fish portions) | <p>Recommended Defect Description</p> <p>Deviations from declared dimensions (e.g. length, <b>width thickness</b> and thickness of a block), non-uniformity of shape, poor angles, ragged edges, ice pockets, air pockets or other damage which would result in product loss.</p> <p><i>[TR: Uruguay proposes replacement of 'anchura' (width) by 'grosor' (thickness)]</i></p> <p><b>-Definition of "loss":</b> Deviation from declared (nominal) dimensions:</p> <p>Length, <b>width thickness</b> and thickness</p> <p><i>[TR: Uruguay proposes replacement of 'anchura' (width) by 'grosor' (thickness)]</i></p> <p>(i) Over 5mm in any dimension.</p> <p>(ii) Edges (formed by two surfaces)<br/>A gap greater than 10 mm between the actual and true edge.</p> <p>(iii) Angles (formed by three edges)<br/>A gap greater than 10 mm between the actual and true corner.</p> |
| b) Ice pockets  | Each pocket with a surface area greater than 10 cm <sup>2</sup> .   |
| c) Air pockets (including troughs)  | Each pocket with a surface area greater than 2 cm <sup>2</sup> and with a depth greater than 3 mm   |
| d) Moderate Dehydration   | A loss of moisture from the surface of the sample unit which  |

	is colour masking, but does not penetrate the surface and can be easily removed by scraping.												
	Over 10% of total <del>surface area</del> <b>depth</b> , or												
	<table border="0"> <thead> <tr> <th><u>Pack size</u></th> <th><u>Defect area</u></th> </tr> </thead> <tbody> <tr> <td>a) &lt;200g units</td> <td>&gt;25cm<sup>2</sup></td> </tr> <tr> <td>b) 201-500g units</td> <td>&gt;50cm<sup>2</sup></td> </tr> <tr> <td>c) 501-5000g units</td> <td>&gt;150 cm<sup>2</sup></td> </tr> <tr> <td>d) 5001-8000g units</td> <td>&gt;300 cm<sup>2</sup></td> </tr> <tr> <td>e) &gt;8000g units</td> <td>&gt;500 cm<sup>2</sup></td> </tr> </tbody> </table>	<u>Pack size</u>	<u>Defect area</u>	a) <200g units	>25cm <sup>2</sup>	b) 201-500g units	>50cm <sup>2</sup>	c) 501-5000g units	>150 cm <sup>2</sup>	d) 5001-8000g units	>300 cm <sup>2</sup>	e) >8000g units	>500 cm <sup>2</sup>
<u>Pack size</u>	<u>Defect area</u>												
a) <200g units	>25cm <sup>2</sup>												
b) 201-500g units	>50cm <sup>2</sup>												
c) 501-5000g units	>150 cm <sup>2</sup>												
d) 5001-8000g units	>300 cm <sup>2</sup>												
e) >8000g units	>500 cm <sup>2</sup>												
e) Skin and <del>Black Membrane Skin</del> <b>Peritoneum</b> (does not include subcutaneous layer). In flat fish white skin is not regarded as a defect.	Skinless fillet block Each piece greater than 3 cm <sup>2</sup>												
f) Black Membrane or Belly Lining (does not include white membrane)	Skin-on fillet blocks Each instance greater than 3 cm <sup>2</sup>												
g) Scales (Attached to skin)	Skin-on fillet blocks (scaled) Each area of scale greater than 3 cm <sup>2</sup>												
Skinless fillets	Skinless fillet blocks												
Scales (Readily noticeable loose scales)	More than 5, in the case of hake fillets, more than 10 loose scales												
h) Blood Clots (spots)	Any mass or lump of clotted blood. <i>(TR: proposed change in Spanish wording only).</i>												
i) Bruises and <del>Discoloration</del> <b>abnormal coloration</b>	Diffused blood causing distinct reddish brownish or other <del>off coloration</del> <b>abnormal coloration</b> which appears as significantly intense discoloration due to melanin deposits, bile stains, liver stains or other causes. Any aggregate area of <del>discoloration</del> <b>abnormal colour</b> or bruising exceeding 3 cm <sup>2</sup> .												
Minced part of mixed blocks:	Objectionable discoloration, spots or particles derived from skin, <del>black membrane</del> <b>peritoneum</b> , blood clots, blood spots, spinal cord or viscera.												
	i) Distinctly discoloured, spotted or otherwise heavily deviating from the colour of the species												
	ii) Objectionable deviation from the colour of the fillet.												
j) Fins or Parts of Fins	Two or more bones connected by membrane, including internal or external bones, or both, in a cluster. Any instance where a bone in the fin exceeds 40 mm in length.												
k) Bones	Any bone greater than or equal to 10 mm in length or with a diameter greater than or equal to 1 mm; any bone less than or equal to 5 mm in length is not to be considered if the diameter is not greater 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 2 mm or if it can be easily stripped off by a finger nail												
Critical bone	Each bone whose maximum profile cannot be fitted into a rectangle, drawn on a flat solid surface, which has a length of 40 mm and a width of 10 mm.												
l) Viscera	Each instance												
m) Packaging material	Each instance												

#### APENDIX IV: OPTIONAL FINAL PRODUCT REQUIREMENTS - FROZEN SURIMI

These end product specifications describe the optional defects for frozen surimi. The descriptions of optional defects will assist buyers and sellers in describing those defect provisions which are often used in commercial transactions or in designing specifications for final products.

Frozen surimi is myofibrillar protein concentrate prepared from fish meat without retaining the original shape of fish, so that it is difficult to determine its quality from its appearance. Moreover, it is generally not consumed directly, but further processed. This means that the quality of frozen surimi is measured by both the compositional properties and the functional properties for surimi-based products. Therefore, it is strongly recommended to inspect such functional properties, as the following quality attributes, that are different from those for other fishery products.

It is most important to evaluate the following primary test attributes: moisture content, pH and objectionable matter of raw surimi and gel strength, deformability, and colour of cooked surimi gel. Other secondary attributes may be measured as desired.

## 1. Primary Quality Attribute

### 1.1 Raw Surimi Tests

#### *Preparation of test sample:*

Put 2-10 kg of frozen surimi in a polyethylene bag, seal the bag, and temper the surimi at room temperature (20°C) or below so that the temperature of the surimi rises to approximately -5°C. Do not soften the surface of the test sample.

#### 1.1.1 Moisture

Sample for moisture content should be taken from the interior of a surimi block to insure no freezer burn (surface dehydration) of the sample has occurred. Put the test sample in a polyethylene bag or polyethylene bottle, seal the bag or bottle and let the test sample thaw so that the temperature of the sealed article rises to room temperature. Then measure the moisture using any of the following methods:

In case of using a drying oven method (see AOAC Method);

In case of using an infrared lamp moisture tester, take out 5 g of the test sample precisely weighed with a sample tray, and dry it immediately [Details of the method to be provided]; or

In case of using a microwave drying moisture tester (see AOAC Method). [Details of an alternate method to be provided].

Calculate the moisture according to the following formula to the first decimal place.

In using any of the measurement methods, test two or more ~~pieces~~ **portions** of the test sample, and indicate the average value obtained thereby.

~~When measuring a fatty test sample~~ **When assessing the moisture of a fatty species** with a microwave drying moisture tester, cover the top of the sample tray with glass fibre paper to prevent fat from splashing, as being dried.

Moisture (%) =  $\frac{\text{Pre-dry weight (g)} - \text{After-dry weight (g)}}{\text{Pre-dry weight}}$

*Comment from Uruguay: this replacement is necessary as the fat is from the fish and not from the sample.*

#### 1.1.2 pH

*Comment from Uruguay: we suggest inserting temperature conditions to standardise them.*

Add 90 or 190 ml as needed to disperse the sample of distilled water to 10 g of the test sample as need to disperse. Homogenize it, and then measure pH of the suspension with a glass electrode pH meter to second decimal place. Indicate the value obtained thereby.

#### 1.1.3 Objectionable Matter

The term "objectionable matter" as used in this item shall mean skin, small bone and any objectionable matter other than fish meat

Spread 10 g of the test sample to the thickness of 1 mm or less, and count the number of visible objectionable matter in it. Indicate the value obtained thereby, provided an objectionable matter of 2 mm or larger shall be counted as one and an objectionable matter smaller than 2 mm shall be counted as one half, respectively, and any unnoticeable matter smaller than 1 mm shall be disregarded.

The inspection method for distinguishing scales visibly unnoticeable is specified in Section 2.1.1 of this Appendix.

## 1.2 Cooked Surimi Gel Tests

### 1.2.1 Gel Strength and Deformability

Two methods are presented here. The test to use should be decided upon between buyer and seller.

#### 1.2.1.1 Puncture Test

*Preparation of test sample:*

Put 2-10 kg of frozen surimi in a polyethylene bag, seal the bag, and temper the surimi at room temperature (20°C) or below so that the temperature of the surimi rises to approximately -5°C. Do not soften the surface of the test sample.

Preparation of surimi gel for testing: Surimi gel not containing added starch

#### A. Comminution

Sample volume necessary for surimi paste preparation depends on the capacity of mixing instrument used. Use of 1.5 kg or more is necessary to represent the property of 10 kg of block. Regarding that enough amount of surimi is necessary for consistency of testing, equipment of large capacity which can mix surimi of 1.5 kg or more must be installed in laboratory. When you use larger size of the equipment, you also need to put in adequate amount of surimi in accordance with equipment to secure enough texture of surimi paste. Crush 1.5 kg or more of the test sample with a silent cutter, then add 3% of salt to it, and further grind and mash it for 10 minutes or more into homogenized meat paste. Remember to keep the temperature of the material to be tested, at 10°C or less.

*Comment from Uruguay: the word 'temperature' is repeated (TR in the Spanish version only).*

Desirable timing for adding salt is at  $-1,5^{\circ}\text{C}$ . 1,5 %

*Comment from Uruguay: error in unit*

Desirable temperature of the test material is 5-8°C.

#### B. Stuffing

Stuff a polyvinylidene chloride tube of 48 mm width (30mm in diameter), when flatten, with approximately 150 g (resulting in approximately 20 cm in length) of the meat paste by the use of a stuffer with a 18 mm diameter stuffing tube, and tie the both ends of the tube.

#### C. Heating

Heat the test material in hot water of 84-90°C for 30 minutes.

At the time the test material is being put in, the temperature drop should not exceed 3°C.

#### D. Cooling

Immediately after finishing the heating treatment, put the test material in cold water and fully cool it, and then leave it at the room temperature for 3 hours or longer.

*Comment from Uruguay: we suggest specifying the temperatures rather than stating cold water or room temperature.*

#### Test method

Perform between 24 and 48 hours after cooking the following measurements of the prepared inspection sample of surimi gel of which temperature should equilibrate to the room temperature and record the temperature of the sample at the time of measurement.

Measure the gel strength and deformability of the inspection sample of surimi gel with a squeeze stress tester (rheometer). Use a spherical (plunger), of which diameter shall be 5 mm and speed shall be 60 mm/minute..

Remove film off the inspection sample of surimi gel, cut it into 25 mm long test specimen, and place test specimen on the sample deck of the tester so that the centre of the test specimen will come just under the

plunger. Apply load to the plunger, and measure the penetration force in g and the deformation in mm at breakage.

Record the obtained value of the penetration and deformation in g by integral number. Record the obtained value of the deformation in mm to the first decimal place.

Prepare six or more test specimens from the same inspection sample of Surimi gel, and test each of them. Record the average values obtained thereby..

### 1.2.1.2 Torsion test

Preparation of the surimi gel test specimen.

#### A. Comminution

Temper frozen surimi at **room temperature** (near 25 degree C) for 1 hr., or in a ~~refrigerated tempering~~ room to **approximately -5°C**. Cut the tempered surimi blocks into slices or chunks and load into bowl of a silent cutter or cutter/mixer equipped for vacuum use. First reduce the frozen surimi to a powder by comminution at low speed without vacuum. Add sodium chloride (2% on total batch weight basis) and ice/water (sufficient to obtain 78% final moisture content on total batch weight basis). Secure the lid and begin chopping again at low speed with no vacuum, gradually (if possible) increasing to high speed (about 2000 rpm). At the point that the mixture becomes a single mass, turn on the vacuum pump and allow approximately 70-80% of a full vacuum (approximately 20- 25 inch Hg or 500-650 mm Hg) to be obtained. During comminution insure that paste is scraped from the walls and balls of paste are forced down into the blades of a cutter/mixer. Discontinue chopping when a temperature of 5-8°C is obtained. A minimum 6 minute chopping time is recommended..

#### B. Stuffing

Transfer the paste to the sausage stuffer with a minimum of air incorporation. Maintain paste temperature below 10°C at all times. Stuff into polycarbonate or stainless steel tubes 1.9 cm (i.d.) of an appropriate length, typically about 20 cm. Tubes should be sprayed with lecithin release agent prior to filling. Stuff the paste uniformly and without air pockets into tubes. Cap or seal both ends and place in ice bath until ready to heat process (within one hour).

#### C. Heating-Heat treatment

Heat process by immersing filled tubes in a water bath previously equilibrated to the proper temperature. Time-temperature relationships for thermal processing are: low temperature setting ability: 0-4°C for 12-18 hours, followed by 90°C for 15 min; median temperature setting ability: 25°C for 3 hours, followed immediately by 90°C for 15 min; high temperature setting ability: 40°C for 30 minutes, followed immediately by 90°C for 15 min; evaluation of protease activity: 60°C for 30 minutes, followed immediately by 90°C for 15 min; rapid cooking effect: 90°C for 15 minutes. It is recommended that water baths be heated to about 5°C higher than the intended treatment temperature, to account for the heat loss experienced upon loading, and the temperature be adjusted approximately within 2 minutes, possibly requiring ice addition.

Only cold water species will demonstrate good setting ability at lower temperatures. The heat process used to prepare the sample should be specified; if not, it is assumed that only the rapid cooking effect is being assessed. Relative proteolytic activity is assessed by comparing tests conducted on gels prepared at 60/90°C with those processed only at 90°C.

Ohmic heating can be used as a means of heating method. Heat is uniformly generated through electrical resistance. Paste placed in a chlorinated PVC tube is heated between two electrodes. Internal temperature of 90 can be reached within 1 min. Heating rate (fast and slow) can be controlled linearly. This method provides another advantage: Pacific whiting surimi or others with proteolytic enzymes can be successfully gelled (without enzyme inhibitors) under ohmic heating because fast heating can inactivate the enzyme.

#### D. Cooling

After heat processing, quickly transfer tubes to an ice water bath and equilibrate to 0°C. Remove gels from tubes with a plunger and seal in plastic bags. Keep samples refrigerated until tested (within 48 hours).

#### Test method

Perform within 24 hours the following measurements of the prepared inspection sample of surimi gel, whose temperature should be equilibrated to the room temperature (20-25°C).

#### Measurement of Stress and Strain:

The gel-forming ability of surimi is evidenced by the fundamental rheological properties of the test product when strained to failure (breakage). Allow refrigerated samples to reach room temperature (near 25°C) before testing. Cut test specimens to length of about 30 mm. Attach specimens to mounting discs at each flat end with cyanoacrylate glue, being careful to place samples in centre of mounting discs. Mill centre of test specimens to a capstan shape, the milled portion being 1 cm. in diameter. Mount the milled test specimen in the torsion rheometer. Rotate top of sample to the point of sample failure (breakage) and record torque and rotational distance at this point. Calculate and report stress and strain at sample failure as: Stress =  $t = 1581 \times$  (torque units); Strain =  $\ln [1+(g^2/2) + g(1+g^2/4)^{0.5}]$ , where  $g = 0.150 \times$  (rotational distance, mm) - 0.00847 x (torque units). In practice these equations are normally programmed onto a computer linked to the torsion rheometer for data acquisition and analysis, thus yielding directly the stress and strain measurements.

#### 1.2.2 Colour

Cut the inspection sample of Surimi gel into flat and smooth slices 15 mm or more thickness, and immediately measure with a colour-difference meter the cross section of the slice pieces in the values of L\*(lightness), a\* (red-green) and b\* (yellow-blue) to the first decimal place. Test three or more slice pieces, and indicate the averages of the values obtained thereby.

### 2. Secondary Quality Attributes

#### 2.1 Raw Surimi Tests

##### *Preparation of test sample:*

Put 2-10 kg of frozen surimi in a polyethylene bag, seal the bag, and defrost the surimi at room temperature (20°C) or below so that the temperature of the surimi rises to approximately -5°C. Do not soften the surface of the test sample..

##### 2.1.1 Objectionable Matter-(Scales)

*Comment from Uruguay: we suggest deleting scales, since objectionable matter has been mentioned previously and are not only scales.*

After the measurement according to Appendix.1.1.3 add 100 ml of water to the same test sample, homogenize it, further add 100 ml of 0.2M-NaOH solution to it, and dissolve it with a stirrer. Filter the dissolved solution with filter paper (No.2), wash the residue with water, and then dry it at 105 for two hours. Count the number of scales obtained thereby, and indicate that number in (brackets) appearing subsequent to the number of the objectionable matter according to Section.1.1.3 of this Appendix.

After having dissolved, leave the dissolved solution still to insure precipitation, and scoop up as much skim as possible before filtration.

*Comment from Uruguay: we suggest finding a more adequate term to replace skim.*