STANDARD FOR SALTED ATLANTIC HERRING AND SALTED SPRAT

CODEX STAN 244-2004

1. SCOPE

The standard applies to salted Atlantic herring (*Clupea harengus*) and sprat (*Sprattus sprattus*)[1]. Fish products produced by use of added natural or artificial enzymatic preparations, acids and/or artificial enzymes are not covered by this standard.

2. DESCRIPTION

2.1 PRODUCT DEFINITION

The product is prepared from fresh or frozen fish. The fish is salted as whole fish or as headed or nobbed or headed and gutted or gibbed or filleted (skin-on or skin-off) fish. Spices, sugar and other optional ingredients may be added. Countries where the product are to be consumed may allow this product in an uneviscerated state or may require evisceration , either before or after processing, since the margin of error in the control of Clostridium botulinum is small even when good practices are followed and the consequences are severe. The product is either intended for direct human consumption or for further processing.

2.2 PROCESS DEFINITION

The fish after any suitable preparation shall be subjected to a salting process and shall comply with the conditions laid down hereafter. The salting process including the temperature and time should be sufficiently controlled to prevent the development of *Clostridium botulinum* or fish should be eviscerated prior to brining.

2.2.1 Salting

Salting is the process of mixing fish with the appropriate amount of food grade salt, sugar spices and all optional ingredients and/or of adding the appropriate amount of salt-solution of the appropriate concentration. Salting is performed in watertight containers (barrels etc.).

2.2.2. Types of salted fish

2.2.2.1 Very lightly salted fish

The salt content in the fish muscle is above 1 g/100 g in water phase and below or equal to 4 g/100 g or less in water phase.

2.2.2.2 Lightly salted fish

The salt content in the fish muscle is above 4 g/100 g in water phase and below or equal to 10 g salt/100 g in water phase.

2.2.2.3 Medium salted fish

The salt content in the fish muscle is above 10 g salt/100 g water phase and below or equal to 20 g salt/100 g in water phase.

2.2.2.4 Heavily salted fish

The salt content of the fish muscle is above 20 g salt /100 g in water phase.

---

[1] For the purpose of the standard, fish includes herring and sprats

2.2.3 Storage temperatures

The products shall be kept frozen or refrigerated at a time/temperature combination which ensures their safety and quality in conformity with Sections 3 and 5. Very lightly salted fish must be kept frozen after processing.

2.3 PRESENTATION

Any presentation of the product shall be permitted provided that it:

2.3.1 meets all requirements of this standard, and

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

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 FISH

Salted Atlantic herring and salted sprats shall be prepared from sound and wholesome fish which are of a quality fit to be sold fresh for human consumption after appropriate preparation. Fish flesh shall not be obviously infested by parasites.

3.2 SALT AND OTHER INGREDIENTS

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

3.3 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.

3.4 DECOMPOSITION

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

4. FOOD ADDITIVES

Only the use of the following additives is permitted.

	Maximum level in the final product
Acidity regulators	
300 Ascorbic acid	GMP
330 Citric acid	GMP
Antioxidants	
200 – 203 Sorbates	200 mg/kg (expressed as sorbic acid)
Preservatives	
210 – 213 Benzoates	200 mg/kg (expressed as benzoic acid)

5. HYGIENE AND HANDLING

5.1 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 Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1985), the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) and other relevant Codex texts such as codes of practice and codes of hygienic practice.

5.2 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria to Foods (CAC/GL 21-1997)

5.3 The product shall not contain any other substance in amounts which may present a hazard to health in accordance with standards established by the Codex Alimentarius Commission.

5.4 PARASITES

Fish flesh shall not contain living larvae of nematodes. Viability of nematodes shall be examined according to Annex I. If living nematodes are confirmed, products must not be placed on the market for human consumption before they are treated in conformity with the methods laid down in Annex II.

5.5 HISTAMINE

No sample unit shall contain histamine that exceeds 20 mg per 100g fish muscle.

5.6 FOREIGN MATERIAL

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

6. LABELLING

In addition to the provisions of the General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985) the following specific provisions apply:

6.1 NAME OF THE FOOD

6.1.1 The name of the product shall be ...-salted herring or ...- salted sprat in accordance with the law and custom of the country in which the product is sold, in a manner not to mislead the consumer.

6.1.2 In addition the label shall include other descriptive terms that will avoid misleading or confusing the consumer.

6.2 LABELLING OF NON-RETAIL CONTAINERS

Information specified above should be given either on the container or in accompanying documents, except that the name of the food, lot identification, and the name of and address of the manufacturer or packer or importer as well as storage instructions shall always appear on the container.

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

7. SAMPLING, EXAMINATION AND ANALYSIS

7.1 SAMPLING PLAN FOR CONTAINERS (BARRELS)

(i) Sampling of lots for examination of the product for quality shall be in accordance with an appropriate sampling plan with an AQL of 6.5.

A sample unit is the individual fish or the primary container.

(ii) Sampling of lots for examination of net weight shall be carried out in accordance with an appropriate sampling plan meeting the criteria established by the Codex Alimentarius Commission.

(iii) Sampling of lots for pathogenic microorganisms and parasites will be in accordance with the Principles for the Establishment and Application of Microbiological Criteria to Foods (CAC/GL 21-1997)

Sampling of lots for histamine will be in accordance with the General Guidelines on Sampling (CAC/GL 50-2004)

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 procedures elaborated in Section 7.3 through 7.8 and Annexes and in accordance with the *Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories* (CAC/GL 31-1999).

7.3 DETERMINATION OF SALT CONTENT

Determination of salt content is performed according to the method in the Standard for Salted Fish and Dried Salted Fish of *Gadidae* Family of Fishes – CODEX STAN 167 –1989

7.4 DETERMINATION OF WATER CONTENT

Determination of water content is performed according to AOAC 950.46B (air drying)

7.5 DETERMINATION OF THE VIABILITY OF NEMATODES: SEE ANNEX I

7.6 DETERMINATION OF HISTAMINE

AOAC 977.13

7.7 DETERMINATION OF NET WEIGHT

The net weight (excluding packaging material) of each sample unit in the sample lot shall be determined.

Remove the herring from the container (barrel) and put it on an appropriate sieve. Allow to drain for 5 min and remove adhering salt crystals. Weigh the herring and calculate net weigh.

8. DEFINITION OF DEFECTIVES

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

8.1.1. 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 and sanitation practices.

8.1.2 Parasites

The presence of readily visible parasites in a sample of the edible portion of the sample unit detected by normal visual inspection of the fish flesh (see Annex III).

8.1.3 Odour and flavour/taste

Fish affected by persistent and distinct objectionable odours or flavours indicative of decomposition (such as sour, putrid, fishy, rancid, burning sensation, etc.) or contamination by foreign substances (such as fuel oil, cleaning compounds, etc.).

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 the appropriate sampling plan in Section 7; and

(ii) the average net weight of all sample units is not less than the declared weight, provided no individual container is less than 95% of the declared weight; and

iii) the Food Additives, Hygiene and Handling and Labelling requirements of Sections 4, 5 and 6 are met.

ANNEX I

VIABILITY TEST FOR NEMATODES (modified method according to Reference 1)

Principle:

Nematodes are isolated from fish fillets by digestion, transferred into 0.5 % Pepsin digestion solution and inspected visually for viability. Digestion conditions correspond to conditions found in the digestive tracts of mammals and guarantee the survival of nematodes.

Equipment:

- Stacked sieves (diameter: 14 cm or larger, mesh size: 0.5 mm)
- Magnetic stirrer with thermostated heating plate
- normal laboratory equipment

Chemicals:

- Pepsin 2000 FIP-U / g
- Hydrochloric acid

Solution:

A: 0.5 % (w/v) Pepsin in 0.063 M HCl

Procedure:

Fillets of approximately 200 g are manually shredded and placed in a 2 l beaker containing 1 l Pepsin solution A. The mixture is heated on a magnet stirrer to 37 °C for 1- 2 h under continuous slow stirring. If the flesh is not dissolved, the solution is poured through a sieve, washed with water and the remaining flesh is quantitatively replaced in the beaker. 700 ml digestion solution A is added and the mixture stirred again under gentle heating (max. 37°C) until there are no large pieces of flesh left.

The digestion solution is decanted through a sieve and the content of the sieve rinsed with water.

Nematodes are carefully transferred by means of small forceps into Petri dishes containing fresh Pepsin solution A. The dishes are placed on a candling dish, and care has to be taken not to exceed 37 °C.

Viable nematodes show visible movements or spontaneous reactions when gently probed with dissecting needles. A single relaxation of coiled nematodes, which sometimes occurs, is not a clear sign of viability. Nematodes must show spontaneous movement.

Attention:

When checking for viable nematodes in salted or sugar salted products, reanimation time of nematodes can last up to two hours and more.

Remarks:

Several other methods exist for the determination of viability of nematodes (e.g. ref. 2, 3).

The described method has been chosen because it is easy to perform and combines isolation of nematodes and viability test within one step.

References:

1. Anon.: Vorläufiger Probenahmeplan, Untersuchungsgang und Beurteilungsvorschlag für die amtliche Überprüfung der Erfüllung der Vorschriften des § 2 Abs. 5 der Fisch-VO. Bundesgesundheitsblatt 12, 486-487 (1988).

2. Leinemann, M. and Karl, H.: Untersuchungen zur Differenzierung lebender und toter Nematodenlarven (*Anisakis sp*.) in Heringen und Heringserzeugnissen. Archiv Lebensmittelhygiene 39, 147 – 150 (1988).

3. Priebe, K., Jendrusch, H. and Haustedt, U.: Problematik und Experimentaluntersuchungen zum Erlöschen der Einbohrpotenz von Anisakis Larven des Herings bei der Herstellung von Kaltmarinaden. Archiv Lebensmittelhygiene 24, 217 – 222 (1973).

ANNEX II

Treatment procedures sufficient to kill living nematodes

- e.g. freezing to - 20° C for not less than 24 h in all parts of the product
- the adequate combination of salt content and storage time (To be elaborated)
- or by other processes with the equivalent effect (To be elaborated)

ANNEX III

Determination of the presence of visible parasites

1. The presence of readily visible parasites in a sample unit that is broken into normal bite-size pieces 20-30 mm of flesh by the thickness of the fillet. Only the normal edible portion is considered even if other material is included with the fillet. Examination should be done in an adequately lighted room (where a newspaper may be read easily), without magnification, for evidence of parasites.

2. Notwithstanding paragraph 1, the verification of the presence of parasites in intermediate entire fishery products in bulk intended for further processing could be carried out at a later stage.