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EAST AFRICAN STANDARD

Edible fish powder — Specification

EAST AFRICAN COMMUNITY

Draft for comments only — Not to be cited as East African Standard

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Introduction

Fish is a potential source of food. The exploration along the vast coastline will further augment its supplies to meet internal demand for edible fish, leaving some surplus also. The use of surplus fish can well be used for production of fish powders of edible quality.

Edible fish powder is prepared for human consumption by a hygienic process that does not involve solvent extraction. Edible fish powder contains all the nutritional ingredients like protein, vitamins and minerals, and has the organoleptic qualities, like taste and flavour, of dry fish. It is completely free from toxic organic solvents and added chemicals.

Being an animal protein, the quality of fish protein is high and the lysine level is particularly good. Its use even in small quantities would serve to boost the protein quality of cereal-based diets wherever feasible. Its use could also be thought of in the formulation of convalescent and formulated foods, either by food manufacturers or in the home. A recommended method for the preparation of edible fish powder is given in Annex A.

In the preparation of this East African Standard, the following sources were consulted extensively:

IS 10059:1981(R2005), *Specification for Edible Fish Powder*

CAC/RCP 52:2003(Rev. 4:2008), *Code of practice for fish and fishery products*

IS 4303-1:1975, *Code of hygienic conditions for fish industry — Part 1: Pre-processing stage*

IS 4303-2:1975, *Code of hygienic conditions for fish industry — Part 2: Canning stage*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/vetdrugs/jsp/vetd_q-e.jsp

USDA Foreign Agricultural Service website: <http://www.mrlatabase.com>

USDA Agricultural Marketing Service website: <http://www.ams.usda.gov/AMSV1.0/Standards>

European Union: http://ec.europa.eu/enterprise/sectors/pharmaceuticals/veterinary-use/maximum-residue-limits/index_en.htm

Assistance derived from these sources is hereby acknowledged.

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Edible fish powder — Specification

1 Scope

This standard prescribes requirements and methods of sampling and test for edible fish powder.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

CAC/GL 30, *Principles and guidelines for the conduct of microbiological risk assessment*

CAC/GL 31, *Guidelines for the sensory evaluation of fish and shellfish in laboratories*

CAC/GL 48, *Model certificate for fish and fishery products*

CAC/RCP 52, *Code of practice for fish and fishery products*

CAC/GL 53, *Guidelines on the judgement of equivalence of sanitary measures associated with food inspection and certification systems*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 79, *Cereals, pulses and milled products — Sampling of static batches*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

3 Raw materials

3.1 Fresh fish of edible quality which is normally consumed whole should be used for preparation. Edible fish powder may be prepared from non-oily white fish like sprats (*Anchovilla* spp), perch, ribbon fish, dhara (dome, etc, either from a single species or their mixture.

3.2 The fish need not be dressed but should be washed and cooked well for the preparation of the powder.

3.3 Poisonous fish like marine snakes, elasmobranch fish with a high quantity of urea, oily fish and fish with black viscera are not considered suitable for the preparation of edible fish powder.

4 Requirements

4.1 Description — Edible fish powder shall be a fine powder free from needle-like bones. It shall blend easily with cereal flours. It shall have a faint yellow colour and the characteristic flavour and taste of dry fish. It shall be free from rancidity and off-flavours.

No organic solvent or chemicals shall be used in its preparation.

4.2 Particle size — Unless otherwise specified, the edible fish powder shall be of such fineness that it passes completely through a 100-mesh sieve [ISO 3310-2].

4.3 The edible fish powder shall comply with the requirements given in Table 1.

4.4 **Protein Efficiency Ratio (PER)** — The PER shall not be less than 2.5.

4.5 **Bacteriological Requirements** — The material shall also comply with the bacteriological requirements given in Table 2.

Table 1 — Requirements for edible fish powder

SI/No.	Characteristic	Requirement	Method of test CD-K-567-2010
(i)	Moisture, % by mass, Max	10	A
(ii)	Crude protein content (N×6.25), on dry basis, % by mass, Min	65	B
(iii)	Total available lysine, g/100 g of protein, Min	6	C
(iv)	Fat content, on dry basis, % by mass, Max	6	D
(v)	Ash, on dry basis, % by mass, Max	18	E
(vi)	Acid insoluble ash, on dry basis, % by mass, Max	0.5	F
(vii)	Fluoride (as F), mg/kg, Max	250	G

Table 2 — Microbiological and heavy metal limits for edible fish powder

Characteristic	Requirement	Method of test
(1)	(3)	(4)
i) Total bacterial count/g, in the finished product, Max	100 000	ISO 4833
ii) <i>Escherichia coli</i> count/g, Max	10	ISO 7251
iii) Faecal <i>Streptococci</i> count/g, Max	100	Annex H
iv) Coagulase positive <i>Staphylococci</i> /g, Max	100	ISO 6888
v) <i>Salmonella</i> , per 25 g	Absent	ISO 6579
vi) <i>Shigella</i> , per 25 g	Absent	ISO 21567
vii) <i>Vibrio cholerae</i> , per 25 g	Absent	ISO/TS 21872
viii) <i>Listeria monocytogenes</i> , per 25 g	Absent	ISO 11290
ix) Heavy metals:		
a) Mercury, mg/kg, Max	0.5	EAS 41
b) Copper, mg/kg, Max	20.0	EAS 41
c) Zinc, mg/kg, Max	50.0	EAS 41
f) Arsenic, mg/kg, Max	0.1	EAS 41
e) Lead, mg/kg, Max	0.3	EAS 41
f) Tin, mg/kg, Max		
(i) For product packed in tin plate	50.0	EAS 41
(ii) For product packed in other packing containers	250.0	EAS 41
g) Cadmium	0.3	EAS 41
h) Methylmercury	0.5	EAS 41

5 Packing and marking

5.1 Packing

The edible fish powder shall be packed in clean, sound containers made of tinplate, PCRC sheets, cardboard paper or other material agreed to between the purchaser and vendor in such a way as to protect it from spillage, contamination, migration of moisture or air from the atmosphere, and seepage of fat into the material through the packing material. When packed in flexible material the packaging material should be capable of withstanding handling during transportation. The edible fish powder shall not come in direct contact with packaging material other than grease-proof or sulphate paper,

cellulose paper or any other nontoxic packing material which may be covered with moisture-proof laminate or coated paper. When packed in metallic containers, the container shall be airtight and completely filled to have minimum air or the space shall be filled with inert gas, or the contents held in vacuum.

5.2 Marking

5.2.1 The following details shall be clearly marked on the container:

- a) Name, type and grade of the material;
- b) Name and address of manufacturer;
- c) Batch/Code number;
- d) Minimum net mass and gross mass;
- e) The words 'Best before (month and year to be indicated)'; and
- f) Any other requirement as given OIML R87, *Quantity of product in prepackages*.

5.2.2 Each container may also be marked with a Certification Mark.

6 Sampling

Representative samples of material for test and criteria for conformity shall be drawn according to the method prescribed in EAS 79.

7 Tests

Tests shall be carried out as prescribed in 4.4 and Tables 1 and 2 using pure chemicals and distilled water (see EAS 123).

NOTE 'Pure chemical' shall mean chemicals that do not contain impurities which affect the test result.

Annex A
(normative)

Method for the preparation of edible fish powder

A.1 Raw material

Edible fish powder can be prepared from lean white fish of pelagic type such as sprats (*Anchovilla* spp). It is very important to remove from the lot oily fish, such as sardine, fish with high urea content, and fish or sea animals, such as marine snakes which may impart toxicity, poison, smell or colour to the product. Only very fresh fish shall be used for the preparation.

A.2 Preparation of pressed cake

A.2.1 Raw miscellaneous fish received from the boat shall undergo preliminary sorting, and fatty fish like sardine, shark, cat fish and non-edible varieties are removed by hand picking. The material shall then be washed well, in a concrete washing tank lined inside with glazed tiles and fitted with false bottom and an outlet pipe, using potable water several times to remove sand, dirt, slime and other extraneous matter.

A.2.2 The washed mass is transferred as such without dressing to a steam-jacketted stainless steel hemispherical kettle having a tilting arrangement, using sufficient quantity (1:1) of potable water to completely immerse the fish. The fish is then cooked at 100°C and boiled for 30 minutes under frequent agitation using a hand ladle till the whole mass is completely disintegrated. After cooking, the slurry is cooled and allowed to stand for some time to settle, so that the oil floats up. The oil-water mixture is decanted off by tilting the vessel. The operation is repeated once more. The solid mass is then taken in a nylon bag and pressed in a screw hydraulic press at a pressure of 5 kg/cm² to remove the maximum amount of water. The pressed cake so obtained is manually broken into small lumps.

A.3 Production of dry powder

The pressed mass is then dried on aluminium trays in a hot air tunnel drier at a temperature of 67 °C to 70 °C to a final moisture level of 5 percent and below. The dried cake while hot is pulverised in a beater type pulveriser to a fine powder. The powder is sieved in a mechanical gravity-type sieving machine to 150-micron size and the oversized produce is pulverised once again, sieved and the final oversize which contains mainly bones, scales, etc, is discarded. The sieving machine shall have all its contact parts made of stainless steel and shall be fitted with two sieves (80 and 150 micron) in two decks, with an arrangement for continuous charging and for receiving products and oversize products continuously without stopping the machine. The product is tested chemically and bacteriologically. The edible fish powder is then packed (see 5.1).

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