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DRAFT EAST AFRICAN STANDARD

Fish protein concentrate — Specification

EAST AFRICAN COMMUNITY

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Foreword

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

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

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.

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.

DEAS 895 was prepared by Technical Committee EAS/TC 003, *Fish and fishery products*.

Introduction

The nutritive value of proteins from fish in many instances is the same as that of milk proteins. Fish proteins are fairly well-balanced in most of the essential amino acids, and are also generally rich in lysine, which is known to be deficient in most cereals, millets, root crops, etc, which form the bulk of the more than two-thirds of the world population. It is now well established that supplementation of diets based on cereals and such other products with fish even at low levels greatly improves the growth-promoting value of the former.

In recent years there is increase in concern for conversion of fish material into fish protein concentrate conforming to prescribed nutritional and hygienic standards.

The objectives of the Standard is to ensure the production of safe and quality fish protein concentrate.

Fish protein concentrate — Specification

1 Scope

This Draft East African Standard specifies requirements, methods of sampling and test for fish protein concentrate intended for human consumption.

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.

AOAC 952.13, *Arsenic in food. Silver diethyldithiocarbamate*

AOAC 972.23, *Lead in fish. Atomic absorption spectrophotome*

AOAC 973.34, *Cadmium in food. Atomic absorption spectrophot*

AOAC 983.20, *Mercury (methyl) in fish and shellfish. Gas chr*

AOAC 999.13, *Lysine, methionine and threonine in pure amino*

CAC/GL 50, *General guidelines on sampling*

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

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 803, *Nutrition labelling — Requirements*

EAS 804, *Claims on foods — Requirements*

EAS 805, *Use of nutritional and health claims — Requirement*

ISO 936, *Meat and meat products — Determination of total ash*

ISO 1736, *Dried milk and dried milk products — Determination of fat content — Gravimetric method (Reference method)*

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

ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique*

ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp.*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 20483, *Cereals and pulses — Determination of the nitrogen content and calculation of the crude protein content — Kjeldahl method*

ISO 21567, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Shigella spp.*

ISO 21527-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 1: Colony count technique in products with water activity greater than 0,95*

ISO 10304-1 2007- *Water Quality- Determination of dissolved anions by liquid chromatography of ions- Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite phosphate and sulfate Specifies a method for the determination*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions shall apply

3.1 fish protein concentrate

is any stable fish preparation, intended for human consumption, in which the protein is more concentrated than in the original fish.

3.2 “food grade material”

material that is free from substances that are hazardous to human health and may be permitted to come in contact with food.”

4 Requirements

4.1 General requirements

4.1.1 Raw materials

The fish used shall itself be in a condition fit for human consumption. Fish protein concentrates may be produced using food grade solvents such as ethanol, iso-propanol, hexane and ethylene dichloride.

4.1.2 Finished products

Fish protein concentrate shall:

- a) be in the form of a fine free-flowing colourless powder that is easy to blend
- b) not have more than a faint odour and taste when added to boiling water in a closed container

- c) be free from dirt, or other extraneous matter,
- d) be free from added colouring and flavouring agents
- e) not containing solvent residues exceeding the limits compatible with good manufacturing practices

4.2 Specific requirements

The fish protein concentrate, when tested in accordance with the relevant methods, shall comply with the requirements given in Table 1 and Table 2.

Table 1 — Requirements for fish protein concentrate

S/No	Characteristic	Requirement	Test method
i	Moisture, % by mass, Max (if in powder form)	8.0	Annex A
ii	Crude protein content (N×6.25), on dry basis, % by mass, Min	80.0	ISO 20483
iii	Fat content, on dry basis, % by mass, Max	0.75	ISO 1736
iv	Ash, on dry basis, % by mass, Max	18	ISO 936
v	Acid insoluble ash, on dry basis, % by mass, Max	0.5	ISO 5985
vi	Available lysine, g/100 g of protein, Min	6.5	AOAC 999.13
vii	Particle Size, 150 micron sieve	0	ISO 3310-2

5 Hygiene

Fish protein concentrate shall be produced and handled in a hygienic manner in accordance with EAS 39 and CAC/RCP 52 and shall comply with the microbiological limits given in Table 2.

Table 2 — Microbiological and heavy metal limits for fish protein concentrate

S/no	Characteristic	Requirement	Test method
i	Yeast and moulds	10 ³	ISO 21527-1
ii	Total bacterial count/g	10 000	ISO 4833
iii	<i>Escherichia coli</i> count/g	Absent	ISO 7251
iv	<i>Staphylococcus aureus</i> CFU/g,	2 x 10 ³	ISO 6888
v	<i>Salmonella</i> , per 25 g	Absent	ISO 6579
vi	<i>Shigella</i> , per 25 g	Absent	ISO 21567

6 Contaminants

6.1 Heavy metals

Fish protein concentrate shall comply with the heavy metal limits given in Table 3.

Table 3 — Heavy metal limits for Fish protein concentrate

S/No	Parameter	Maximum limit, mg/kg	Test method
i	Arsenic	0.1	AOAC 952.13
ii	Lead	0.3	AOAC 972.23
iii	Cadmium	0.3	AOAC 973.34
iv	Mehtyl mercury	1.0	AOAC 983.20

6.2 Other contaminants

Fish protein concentrate shall not exceed limits of other contaminants specified in table 4.

Table 4 — Other contaminants

S/No	Contaminant	Maximum limit,mg/kg	Test method
i	Melamin	2.5	HPLC / ELISA
ii	Flouride	250	ISO 10304-1

7 Weights and measures

The weight of the product shall comply with Weights and Measures regulations of the Partner States.

8 Packaging

The fish protein concentrate (FPC) shall be packaged in food grade containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the product.

9 Labelling

9.1 In addition to the requirements in EAS 38, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

- a) name of the product, fish protein concentrate and name of specie,
- b) name and address of the manufacturer.
- c) batch/Code number,
- d) net weight in metric units
- e) date of manufacture, and
- f) expire date

9.2 Nutritional labelling, nutrition and health claims may be made in accordance with EAS 803, EAS 804 and EAS 805.

10 Sampling

Sampling shall be done in accordance with CAC/GL 50.

Annex A (normative)

Determination of moisture content

A.1 Principle

The sample is dried to constant weight in an oven.

A.2 Apparatus

A.2.1 Moisture dishes, made of nickel, stainless steel, aluminium or porcelain, with well-fitting lids

A.2.2 Oven

A.2.3 Desiccator

A.3 Procedure

Weigh accurately about 10 g of the sample in a suitable moisture dish, previously dried in an oven and weighed. Place the dish in an oven maintained at $105\text{ °C} \pm 2\text{ °C}$ for five hours. Cool the dish in a desiccator and weigh with the lid on. Repeat the process of heating, cooling and weighing at half-hour intervals until the loss in mass between two successive weightings is less than 1 mL. Record the lowest mass obtained. Preserve the dish containing this dried material in a desiccator for the determination of total ash (see B.2.3).

A.4 Calculation

The moisture content shall be expressed as follows:

$$\text{Moisture, \% by mass} = \frac{m_1 - m_2}{m_1 - m} \times 100$$

where

m_1 is the mass, in grams, of the moisture dish with material before drying;

m_2 is the mass, in grams, of the moisture dish with the material after drying; and

m is the mass, in grams, of the empty moisture dish.

Bibliography

IS 9808:1981(R2005), Specification for Fish Protein Concentrate

CKS 286:1971, Fish protein concentrate for human consumption

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

