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EAST AFRICAN STANDARD

Compounded fish feeds — Specification — Part 1: Trout feeds

EAST AFRICAN COMMUNITY

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

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

KS 01-871:1992, *Specification for compounded fish feeds — Part 1: Trout feeds*

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.mrlidatabase.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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Compounded fish feeds — Specification — Part 1: Trout feeds

1 Scope

This Part 1 of this Kenya Standard prescribes requirements for dry compounded trout feeds used as a complete diet and serving as the only source of nutrients for cultured trout species.

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.

ISO 5061, *Animal feeding stuffs — Determination of castor oil seed husks — Microscope method*

ISO 5506, *Soya bean products — Determination of urease activity*

ISO 5510, *Animal feeding stuffs — Determination of available lysine*

ISO 5983-1, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 1: Kjeldahl method*

ISO 5983-2, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 2: Block digestion/steam distillation method*

ISO 5984, *Animal feeding stuffs — Determination of crude ash*

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

ISO 6490-1, *Animal feeding stuffs — Determination of calcium content — Part 1: Titrimetric method*

ISO 6491, *Animal feeding stuffs — Determination of phosphorus content — Spectrometric method*

ISO 6492, *Animal feeding stuffs — Determination of fat content*

ISO 6493, *Animal feeding stuffs — Determination of starch content — Polarimetric method*

ISO 6495, *Animal feeding stuffs — Determination of water-soluble chlorides content*

ISO 6496, *Animal feeding stuffs — Determination of moisture and other volatile matter content*

ISO 6497, *Animal feeding stuffs — Sampling*

ISO 6498, *Animal feeding stuffs — Preparation of test samples*

ISO 6651, *Animal feeding stuffs — Semi-quantitative determination of aflatoxin B1 — Thin-layer chromatographic methods*

ISO 6654, *Animal feeding stuffs — Determination of urea content*

ISO 6655, *Animal feeding stuffs — Determination of soluble nitrogen content after treatment with pepsin in dilute hydrochloric acid*

ISO 6865, *Animal feeding stuffs — Determination of crude fibre content — Method with intermediate filtration*

ISO 6866, *Animal feeding stuffs — Determination of free and total gossypol*

ISO 6867, *Animal feeding stuffs — Determination of vitamin E content — Method using high-performance liquid chromatography*

ISO 6869, *Animal feeding stuffs — Determination of the contents of calcium, copper, iron, magnesium, manganese, potassium, sodium and zinc — Method using atomic absorption spectrometry*

ISO 7088, *Fish-meal — Vocabulary*

ISO 7485, *Animal feeding stuffs — Determination of potassium and sodium contents — Methods using flame-emission spectrometry*

ISO 9831, *Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method*

ISO 13903, *Animal feeding stuffs — Determination of amino acids content*

ISO 13906, *Animal feeding stuffs — Determination of acid detergent fibre (ADF) and acid detergent lignin (ADL) contents*

ISO 14181, *Animal feeding stuffs — Determination of residues of organochlorine pesticides — Gas chromatographic method*

ISO 14182, *Animal feeding stuffs — Determination of residues of organophosphorus pesticides — Gas chromatographic method*

ISO 14183, *Animal feeding stuffs — Determination of monensin, narasin and salinomycin contents — Liquid chromatographic method using post-column derivatization*

ISO 14565, *Animal feeding stuffs — Determination of vitamin A content — Method using high-performance liquid chromatography*

ISO 14718, *Animal feeding stuffs — Determination of aflatoxin B1 content of mixed feeding stuffs — Method using high-performance liquid chromatography*

ISO 16634-1, *Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content — Part 1: Oilseeds and animal feeding stuffs*

ISO 17372, *Animal feeding stuffs — Determination of zearalenone by immunoaffinity column chromatography and high performance liquid chromatography*

ISO 17375, *Animal feeding stuffs — Determination of aflatoxin B1*

3 Definitions

For the purpose of this standard the following definitions shall apply:

3.1

trout

Any fish of the family salmonidae. Commonly known species include rainbow trout, brown trout and brook trout.

3.2

palatable

Of reasonable hardness and free of compounds that are offensive to the olfactory receptors of the fish.

3.3**feedable**

Water stable (resistant to sudden crumbling) and float long enough in water to be accessible.

3.4**Fines**

Particles passing through a 420 µm screen or 0.42 mm (1 mm = 1 000 µm).

4 General requirements

4.1 Compounded trout feeds may be in the form of pellets, crumbles or cubes.

4.2 Pellet/crumble sizes — The pellets or crumbles shall comply with the size specifications in Tables 1 and 2.

Table 1 — Crumble size for fry and fingerlings (starter diet)

Length of trout (cm)	Crumble size (mm)	Size tolerance diameter (per cent)
0 to 3.5	0.3 to 0.5	10
3.51 to 5	1 to 1.2	10
5.1 to 7.5	1.5 to 1.8	10

Table 2 — Pellet size for growers and breeders

Length of trout (cm)	Pellet size (mm)	Size tolerance diameter (per cent)
7.51 to 15	2 to 2.2	10
15.1 to 15.5	3 to 3.2	10
15.51 to 22.5	4 to 4.5	10
22.51 and above	8	10

4.3 The feeds shall be free from pathogenic bacteria, metallic objects and pesticide residues.

4.4 The feeds shall be palatable and feedable.

4.5 The feeds shall be free of mouldy growth and rancidity which is indicative of spoilage.

4.6 For all the different types of feeds, the total content of 'fines' shall not exceed 3 % by weight.

4.7 The aflatoxin levels shall be not more than 1ppb (0.001 µg/kg) when tested according to the method prescribed in ISO 17375.

5 Nutrient requirements

5.1 Compounded feeds for trout shall comply with the compositional requirements specified in Table 3.

5.2 The feeds shall contain vitamins and minerals specified in Table 4.

Table 3 — Compositional requirements

	Starter diet	Grower diet	Brood-stock diet	Test method
	Small fry (crumble) 0 to 7.5 cm	Medium sized trout (pellets) 7.6 to 22.5 cm	Large size trout (pellets) 23 cm and above	
Crude protein	45 min	40 min	35 min	ISO 5983-1/-2
Moisture	10 max	10 max	10 max	ISO 6496
Crude fibre	4 max	5 max	5 max	ISO 6865
Crude fat	15 to 20	10 to 15	10 to 15	ISO 6492
Total ash	10 max	10 max	10 max	ISO 5984
Calcium	0.2 to 1	0.2 to 1	0.2 to 1	ISO 6490-1
Phosphorus	0.7 to 0.8	0.7 to 0.8	0.7 to 0.8	ISO 6491

5.3 Antioxidant requirement — Antioxidant per kg feed shall be as follows:

B.H.T.	150 mg
B.H.A.	20 mg
Ethoxyquin	150 mg

This list may be extended to include other types of antioxidants approved by KEBS.

Table 4 — Level of minerals and vitamins in compounded trout feeds (complete diet)

MINERALS AND VITAMINS	LEVEL
	Units = mg/kg (dry basis) amount per kg of feed
Copper	1 to 4 mg/kg
Zinc	30 to 100 mg/kg
Manganese	20 to 50 mg/kg
Iodine	100 to 300 mg/kg
Iron	50 to 100 mg/kg
Vitamin B ₁₂	0.02 to 0.05 mg/kg
Vitamin A (min.)	12 000 IU
Vitamin D	1 800 to 2 000 IU
Choline	1 000 to 15 000 mg/kg
Vitamin E	50 mg/kg
Riboflavin (min.)	20 mg/kg
Pyridoxine	10 to 15 mg/kg
Pantothenic (min.)	50 mg/kg
Biotin	0.8 to 1.5 mg/kg
Folacin (min.)	5 mg/kg
Niacine	150 to 200 mg/kg
Ascorbic acid (min.)	600 mg/kg
Institol	300 to 400 mg/kg
Thiamine	10 to 20 mg/kg

6 Packaging and labelling

6.1 Packaging

The feed shall be packaged in containers that shall protect the product from spillage and damage during normal handling, transportation and storage.

6.2 Labelling

The package shall be marked, or bear tags, to display the following information:

- (i) Name of product (diet identification);
- (ii) Pellet size/crumble size;
- (iii) Address of manufacturer;
- (iv) Date of manufacture;
- (v) Net weight;
- (vi) 'Best use before' date.

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Annex A
(normative)

Ingredients for feeds

The following ingredients may be used in fish feed manufacture:

A.1 Grain product

Wheat flour
Oat flour
Wheat bran
Wheat germ
Rice bran
Rice (hulled)
Rye
Millet
Barley
Sorghum
Cassava

A.2 Protein sources

Fishmeal
Hydrolyzed feather meal
Bloodmeal
Meatmeal
Dry whey
Skimmed milk (dry)
Whole milk

A.3 Soybean meal

Alfalfa meal
Potatoes (*Solanum tuberosum*)
Linseed meal

A.4 Industrial by-products

Sunflower cake (decorticated)
Brewer's yeast
Peanut cake
Cotton seed cake (decorticated)

A.5 Other ingredients

Vitamin and mineral pre-mixes
Calcium phosphate
Ethoxyquin (antioxidant)
Cantaxanthin (Optional ingredient to improve colour)

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