

Compounded tilapia feeds — Specification

Part 1:

Complete feeds

KS 2289-1:2016

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

Ministry of Agriculture Livestock and Fisheries — State Department of Livestock
Kenya Marine and Fisheries Research Institute
Unga Farm Care EA Ltd.
Kenyatta University—Department of animal science
Modern Ways Ltd.
Joeliz Bone meal Ltd.
Consumer Information Network
Proctor and Allan EA Ltd.
State Department of Veterinary Services
Association of Kenya Feed Manufacturers(AKEFEMA)
Pioneer Feeds Ltd.
Pembe Flour Mills Ltd.
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Foreword

This Kenya Standard has been prepared by the Technical Committee on Animal Feeds under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Commercial compounded feeds for intensive fish culture have been developed in a few industrialized countries with a long history of agriculture. Most of the present day information and data on fish feeds is based on nutritional and diet development work carried out on cold water species of fish in those countries.

The development of this standard is geared to the need for developing suitable fish feeds based on locally available ingredients while ensuring that such diets provide a suitable energy source and are balanced for tilapia to facilitate fast growth. Such feeds must not only be acceptable, available and easily digestible by the fish, but should be of a chemical composition that will encourage fast growth, good conversion and survival.

Though it is recognized that there still exists many gaps in our knowledge concerning the nutrition of most fish species cultured in the tropics, some progress has been made with regard to specific diets for species such as tilapia. The standard should encourage local production of formulated fish feeds which are of acceptable quality.

During the preparation of this standard, assistance was derived from the following document:

Nutrient requirements of fish (1993) published by the National Academics Press.

Acknowledgement is hereby made for assistance derived from this source.

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Part 1:

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1 Scope and field of application

This Kenya Standard prescribes requirements for compounded tilapia feeds used as a complete diet and serving as the only source of nutrients for tilapia fish.

This standard shall apply to the following types of tilapia fish feeds;

- a) Starter;
- b) Grower;
- c) Finisher; and
- d) Brooder

2 Definitions

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

2.1

tilapia

any fish of the family *Cichlidae*

2.2

starter

feed for small fry and fingerlings

2.3

Grower

feed for fish between 50 g -200g

2.4

finisher

feed for fish which are more than 200g and which are not reared for breeding

2.5

brooders

feed for mature tilapia fish where males are more than 80g and females are more than 50g in weight reared for breeding

2.6

Palatable

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

2.7

feedable

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

2.8

fines

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

3 General requirements

3.1 Compounded tilapia feeds shall be in the form of floating pellets, slow sinking pellets, mash or crumbles.

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

3.3 The feeds shall be palatable and feedable.

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

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

3.6 Total aflatoxin content shall not be more than 10 ppb and 5ppb for aflatoxin B1.

3.7 The shelf life of the supplemental feed shall be 6 months.

4 Nutrient requirements

4.1 Compounded complete feeds for tilapia shall comply with the requirements specified in Table 1.

4.2 The feeds shall contain vitamins and minerals specified in Table 2.

Table 1 — Requirements for compounded complete tilapia feeds

Sl.No.	Parameters	Starter feed	Grower feed	Finisher feed	Brooder feed
i)	Fish weight (g)	< 50	50-200	≥ 200	≥ 50 (females) ≥ 80 (males)
ii)	Feeding rate% body weight	6 – 8	3	2 - 4	4 - 6
iii)	Crude protein % (min).	35	30	30	32
iv)	Energy (DE) Kcal/Kg (min).	2500	2750	2900	2800
v)	Amino acid levels				
	a) Lysine g/kg (min).	2.1	1.7	1.7	1.7
	b) Methionine g/kg (min)	0.9	0.8	0.8	0.81.1
	c) Methionine +cysteine	1.4	1.1	1.1	1.0
	d) Threonine	1.3	1.0	1.0	0.4
	e) Tryptophan	0.5	0.4	0.4	
vi)	Crude fiber % (max).	4	10	10	10
vii)	Crude fat % .	5-12	5-15	5-15	5-15
Viii)	Fatty Acids				
	a) Linoleic acid	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
viii)	Pellet size(mm)	2 (max)	2 – 5	4 - 6	2 - 5
ix)	Pellets should float on water for (minutes-minimum)	2	2	2	2
x)	Moisture content of pellets (% Max).	10	10	10	10
xi)	Calcium %	0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.4 - 0.65
xii)	Phosphorus %	0.8 – 1.5	0.8 – 1.5	0.8 – 1.5	0.8 – 1.5

Table 2—Level of minerals and vitamins in compounded complete tilapia feeds

Sl. No.	Minerals and Vitamins on dry matter basis per kg of feed (min)	Starter feed	Grower feed	Finisher feed	Brooder feed
i)	Copper mg/Kg	6 2-3 4-5	3 2-3	6 2-3	6 2-3
ii)	Zinc mg/Kg	100 20	50 20	100 20	100 20
iii)	Manganese mg/Kg	50 12	25 12	50 12	50 12
iv)	Iodine mg/Kg	6 1	3 1	6 1	6 1
v)	Iron mg/Kg	60	30	60	60
vii)	Vitamin A IU/Kg	3000	1500	3000	3000
vii)j	Vitamin D IU/Kg	1500	750	1500	1500
ix)	Choline mg/Kg	1000	600	1000	1000
x)	Vitamin E mg/Kg	120 50-100	60 50-100	120 50-100	120 50-100
xi)	Riboflavin mg/Kg B2	24 5-	12 5	24 5	24
xii)	Pyridoxine mg/Kg B6	15	13	13	15
xiii)	Pantothenic mg/Kg	48 10	24 10	48 10	48 10
xiv)	Biotin mg/Kg	0.2 0.06	0.1 0.06	0.2 0.06	0.2 0.06
xv)	Ascorbic acid mg/Kg C	300 50	150 50	300 50	300 50
xvi)	Inositol mg/Kg	150 400	75 400	150 400	150 400

xvii)	Thiamine mg/Kg	18	9	18	18
	B1	2	2	2	2

5 Packaging and labelling

5.1 Packaging

The feeds shall be packed and supplied in airtight and suitable weather-resistant material. e.g. laminated bags

Each package for tilapia feeds shall be clean and free from visible indications of contamination, infection and insect infestation.

5.2 Labelling

The packages shall be securely closed and marked with the following information:

- a) name of product;
- b) category of fish for which it is intended;
- c) form and size e.g. mash, crumble or pellet;
- d) net weight of the product;
- e) batch number;
- f) name and physical address of the manufacturer;
- g) date of manufacture;
- h) date of expiry;
- i) instructions for use and storage;
- j) nutrition declaration (moisture, crude protein, crude fat, crude fibre, ash)
- k) feeding rate shall be displayed in grams /day.