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**DRAFT MALAWI STANDARD
(SADC HARMONIZED)**

Fresh and chilled fish – Specification

Note: This is a draft standard and it shall neither be used nor regarded as a Malawi standard

Fresh and chilled fish – Specification

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FOREWORD

This draft standard is a Southern African Development Community (SADC) Harmonized Text (SADCSTAN) covering the requirements and methods of tests for fresh and chilled fish.

The harmonization of standards and technical regulations in the SADC region is an obligation under the SADC protocol on Trade which was established under the SADC Treaty to provide for elimination of tariffs and non-tariff barriers to trade.

This standard is identical to SADC HT 82, *Fresh and chilled fish – Specification*.

Acknowledgement is made for the use of the above standard.

TECHNICAL COMMITTEE

This draft standard was prepared by the Technical Committee MBS/TC 39, *Fish and fishery products*, and the following companies, organizations and institutions were represented:

Malawi Bureau of Standards.

MALDECO Fisheries

Malawi College of Fisheries;

Ministry of Agriculture, Irrigation and Water Development – Department of Fisheries;

Lake Harvest; and

Lilongwe University for Agriculture and Natural Resources.

NOTICE

This standard shall be reviewed every five years, or earlier when it is necessary, in order to keep abreast of progress. Comments are welcome and shall be considered when the standard is being reviewed.

DRAFT MALAWI STANDARD

Fresh and chilled fish - Specification

1 SCOPE

This draft standard applies to fresh and chilled fish as defined and offered for direct consumption without further processing. It does not apply to products indicated as intended for further processing or for other industrial use.

2 NORMATIVE REFERENCES

The following standard contains provisions, which through reference in this text, constitute provisions of this draft standard. All standards are subject to revision and, since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this draft standard are encouraged to take steps to ensure the use of the most recent edition of the standard indicated below. Information on current valid national and international standards can be obtained from the Malawi Bureau of Standards.

MS 19: *Labelling of prepacked foods – General standard;*

MS 21: *Food and food processing units – Code of hygienic conditions;*

MS 188: *Edible salt – Specification;*

MS 214: *Potable water – Specification;*

MS 237: *Food additives – General standard;*

MS 302: *General standard for contaminants and toxins in foods and feed;*

MS 790: *Code of practice for fish and fishery products;*

MS 1241: *Guidelines for the sensory evaluation of fish and shellfish in laboratories;*

CODEXSTAN 233: *Sampling plans for prepackaged foods (AQL-6.5);*

ISO 4833: *Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of microorganisms – Colony-count technique at 30 degrees;*

ISO 6579: *Microbiology of food and animal feeding stuffs – Horizontal method for the detection of Salmonella spp.;*

ISO 6888: *Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species);*

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 7937: *Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of Clostridium perfringens – Colony-count technique;*

ISO 11290: *Microbiology of the food chain – Horizontal method for the detection and enumeration of Listeria monocytogenes and of Listeria spp.;*

ISO 16050: *Foodstuffs – Determination of aflatoxin B1, and the total content of aflatoxin B1, B2, G1 and G2 in cereals, nuts and derived products – High performance liquid chromatographic method;*

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 0.9;*

ISO/TS 21872-1: *Microbiology of food and animal feeding stuffs – Horizontal method for the detection of potentially enteropathogenic Vibrio spp. – Part 1: Detection of Vibrio parahaemolyticus and Vibrio cholera;*

ISO/TS 21872-2: *Microbiology of food and animal feeding stuffs – Horizontal method for the detection of potentially enteropathogenic Vibrio spp. – Part 2: Detection of species other than Vibrio parahaemolyticus and Vibrio cholera;*

ISO 27085: *Animal feeding stuffs – Determination of calcium, sodium, phosphorus, magnesium, potassium, iron, zinc, copper, manganese, cobalt, molybdenum, arsenic, lead and cadmium by ICP- AES;*

AOAC 990.04: *Mercury (Methyl) in sea food by liquid chromatography-Atomic Absorption Spectroscopy (LC-AAS);* and

AOAC 977.15 / 974.14: *Mercury in fish by Flame Atomic Absorption Spectroscopy (FAA).*

3 DEFINITIONS

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

3.1 chilling

the process of cooling fish products to a temperature approaching that of melting ice

3.2 establishment

any premises where fish products are prepared, processed, chilled, frozen, packaged or stored. Auction and wholesale markets in which only display and sale by wholesale takes place are not deemed to be establishments

3.3 fish products

all seawater or freshwater animals or parts thereof, including their roes, excluding aquatic mammals, frogs and other aquatic animals

3.4 fresh fish

freshly caught, chilled marine and freshwater fish

3.5 fresh products

any fish product whether whole or prepared, including products packaged under vacuum or in a modified atmosphere, which have not undergone any treatment to ensure preservation other than chilling

3.6 food grade material

packaging material, made of substances which are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product

3.7 foreign matter

any material which is not of fish origin e.g. sand, stones, metallic chips, plant parts etc

3.8 sound

free from physiological deterioration or adulteration/contamination, that appreciably affects their appearance, edibility and the keeping quality of the dried fish

4 ESSENTIAL COMPOSITION AND QUALITY FACTORS

4.1 Whatever the variety, whole fresh fish shall have the following characteristics that indicate freshness:

4.1.1 Bright, clear, full eyes that are often protruding. As the fish loses freshness, the eyes become cloudy, pink, and sunken;

4.1.2 Bright red or pink gills. Avoid fish with dull-coloured gills that are gray, brown, or green;

4.1.3 Slime shall be transparent and slippery;

4.1.4 Firm and elastic flesh that springs back when pressed gently with the finger. With time, the flesh becomes soft and will slip away from the bone;

4.1.5 Shiny skin, with scales that adhere tightly. Characteristic colours and markings start to fade as soon as a fish leaves the water; and

4.1.6 The marine and freshwater fish shall have a characteristic fresh appearance, colour and odour.

4.2 The product when tested in accordance to appropriate methods as indicated, the microbial counts shall be within the limits given in Table 1.

Table 1: Microbiological limits for fresh and chilled fish

SL No	Micro-organisms	Max. limits	Method of test
i)	<i>Salmonella</i> per 25 g, max	Absent	ISO 6579
ii)	<i>E. coli</i> per gram, max	Absent	ISO 7251
iii)	<i>Listeria monocytogenes</i> , max	Absent	ISO 11290
iv)	<i>Staphylococcus aureus</i> cfu per gram, max	10 ²	ISO 6888
v)	<i>Clostridium perfringens</i> per gram, max	Absent	ISO 7937
vi)	<i>Vibrio Spp</i> per gram, max	Absent	ISO 21872
vii)	Total viable count per gram, max	10 ⁵	ISO 4833

5 FOOD ADDITIVES

No additives are allowed in fresh and chilled fish.

6 CONTAMINANT

6.1 Heavy metals

Fresh and chilled fish shall conform to those maximum levels for heavy metals and other contaminants as stipulated in MS 302.

6.2 Veterinary drugs

The product shall comply with the residual limits of veterinary drugs specified by the Codex Alimentarius.

7 HYGIENE

7.1 The products covered by the provisions of this draft standard shall be prepared and handled in accordance with the appropriate sections of the MS 21 and 790.

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

8 STORAGE AND TRANSPORT

8.1 Fish products shall, during storage and transport, be kept at the temperatures laid down in this draft standard and in particular fresh fish products must be kept at the temperature of melting ice;

8.2 Products may not be stored or transported with other products which may contaminate them or affect their hygiene, unless they are packaged in such a way as to provide satisfactory protection.

8.3 Vehicles used for the transport of fish products must be constructed and equipped in such a way that the temperatures laid down in this standard can be maintained throughout the period of transport. If ice is used to chill the products, adequate drainage must be provided in order to ensure that water from melted ice does not stay in contact with the products. The inside surfaces of the means of transport must be finished in such a way that they do not adversely affect the fish products. They must be smooth and easy to clean and disinfect.

8.4 Means of transport used for fish and fish products may not be used for transporting other products likely to impair or contaminate the products, except where the fish products can be guaranteed uncontaminated as a result of such transport being thoroughly cleaned and disinfected.

8.5 Fish products may not be transported in a vehicle or container which is not clean or which should have been disinfected.

8.6 The vehicles shall be visibly and clearly marked.

9 PACKAGING AND LABELLING

9.1 Packaging

Fresh and chilled fish shall be packaged in food grade containers.

9.2 Labelling

In addition to the requirements in MS 19, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

9.2.1 Name of the fish

9.2.1.1 The name of the product as declared on the label shall be "... fresh fish".

9.2.1.2 There shall appear on the label reference to the form of presentation in close proximity to the name of the food in such additional words or phrases that will avoid misleading or confusing the consumer.

9.2.1.3 The term "fresh fish", shall also appear on the label.

9.2.2 Net contents. The net contents of the product shall be clearly indicated on the package.

9.2.3 Storage instructions. The label shall include storage instructions.

9.2.4 Origin. The origin of the product shall be clearly and visibly marked on the product.

9.2.5 Shelf life or expiry date of the products shall be clearly marked on the package.

9.3 Labelling of non-retail containers

9.3.1 Information on the above provisions shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the processor or packer as well as storage instructions, shall appear on the container.

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

10 METHODS OF SAMPLING AND TESTS

10.1 Sampling

10.1.1 Sampling of lots for examination of the product shall be done in accordance with the CODEXSTAN 233.

10.1.2 Sample unit is the primary container, or for individually fresh fish products is at least a 1 kg portion of the sample unit.

10.2 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 MS 1241 and Annex A.

10.3 Determination of net weight

The net weight (exclusive of packaging material) of each sample unit representing a lot shall be determined in the fresh state.

10.4 Procedure for the detection of parasites (type 1 method)

The entire sample unit is examined non-destructively by placing appropriate portions of the fresh sample unit on a 5 mm thick acryl sheet with 45 % translucency and candled with a light source giving 1500 lux 30 cm above the sheet.

10.5 Determination of gelatinous condition

According to the AOAC Methods - "Moisture in Meat and Meat Products, Preparation of Sample Procedure"; 983.18 and "Moisture in Meat" (Method A); 950.46.

11 DEFINITION OF DEFECTS

A sample unit will be considered defective when it exhibits any of the properties defined below.

11.1 Foreign matter

The presence in the sample unit of any matter, which has not been derived from the fish or the packing media, 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.

11.2 Odour/flavour

A sample unit affected by persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity.

11.3 Texture

11.3.1 Excessively mushy flesh uncharacteristic of the species in the presentation.

11.3.2 Excessively tough or fibrous flesh uncharacteristic of the species in the presentation.

11.4 Discolouration

A sample unit affected by distinct discolouration indicative of decomposition or rancidity or by sulphide staining of more than 5 % of the fish by weight in the sample unit.

11.5 Objectionable matter

A sample unit affected by struvite crystals - any struvite crystal greater than 5 mm in length.

12 LOT ACCEPTANCE

A lot will be considered as meeting the requirements of this standard when:

12.1 The total number of "defectives" as classified according to section **11** does not exceed the acceptance number (c) of the appropriate sampling plan in the CODEXSTAN 233.

12.2 The average net contents of all containers examined is not less than the declared weight, provided there is no unreasonable shortage in any containers;

12.3 The requirements of clauses **4, 5, 6, 7, and 8** are met.

ANNEX A
(Normative)

SENSORY AND PHYSICAL EXAMINATION

A.1 Complete net weight determination according to defined procedures in section **8.3** (de-glaze as required).

A.2 Individually examine each fish in the sample unit for the presence of foreign matter, parasites, bone where applicable, odour, and flesh abnormality defects.

A.3 In cases where a final decision on odour cannot be made in the fresh uncooked state, a small portion of the disputed material (approximately 200 g) is sectioned from the sample unit and the odour and flavour confirmed without delay by using one of the cooking methods defined in section **8.6**.

A.4 In cases where a final decision on gelatinous condition cannot be made in the fresh uncooked state, the disputed material is sectioned from the product and gelatinous condition confirmed by cooking or by using the procedure in Section **8.5** to determine if greater than 86 % moisture is present in any fish. If a cooking evaluation is inconclusive, then the procedure in **8.5** would be used to make the exact determination of moisture content.

ANNEX B
(Normative)

GENERAL CONDITIONS FOR ESTABLISHMENTS

B.1 General conditions relating to premises and equipment

Establishment shall afford at least the following facilities:

B.1.1 Working areas of sufficient size for work to be carried out under adequate hygienic conditions. Their design and layout shall be such as to preclude contamination of the product and keep quite separate the clean and contaminated parts of the building;

B.1.2 In areas where products are handled, prepared and processed;

B.1.2.1 Waterproof flooring which is easy to clean and disinfect and laid down in such a way as to facilitate the drainage of the water or provided with equipment to remove water;

B.1.2.2 Walls which have smooth surfaces and are easy to clean, durable and impermeable;

B.1.2.3 Ceilings or roof linings which are easy to clean;

B.1.2.4 Doors shall be self-closing and made of durable materials which are easy to clean;

B.1.2.5 Adequate ventilation and, where necessary, good steam and water-vapour extraction facilities;

B.1.2.6 Adequate natural or artificial lighting;

B.1.2.7 An adequate number of facilities for cleaning and disinfecting hands. In work rooms and lavatories taps must not be hand-operable. These facilities must be provided with single use hand towels;

B.1.2.8 Facilities for cleaning plant, equipment and utensils;

B.1.3 In cold rooms where fish products are stored:

B.1.3.1 The provisions set out under point (ii) (a), (b), (c), (d) and (e);

B.1.3.2 Where necessary, a sufficiently powerful refrigeration plant to keep products at temperatures prescribed in this draft standard.

B.1.4 Appropriate facilities for protection against pests such as insects, rodents, birds, etc.

B.1.5 Instruments and working equipment shall be made of stainless steel, easy to clean and disinfect;

B.1.6 Special watertight, corrosion-resistant containers for fish products not intended for human consumption and premises for the storage of such containers if they are not emptied at least at the end of each working day;

B.1.7 Facilities to provide adequate supplies of safe water within the meaning of *WHO Guidelines on drinking water* or alternatively of clean water treated by an appropriate system, under pressure and in sufficient quantity. However, by way of exception, a supply of non-drinking water is permissible for the production of steam, fire-fighting and the cooling of refrigeration equipment, provided that the pipes installed for the purpose preclude the use of such water for other purposes and present no risk of contamination of the products. Non-drinking-water pipes must be clearly distinguished from those used for drinking water;

B.1.8 Hygienic waste water disposal system;

B.1.9 An adequate number of changing-rooms with smooth, water-proof, washable walls and floors, wash basins and flush lavatories. The latter may not open directly onto the work rooms. The wash basins must have materials for cleaning the hands and disposable towels; the wash basin taps must not be hand-operable;

B.1.10 If the volume of products treated requires regular or permanent presence an adequately equipped lockable

B.1.11 Floors, walls and partitions, ceilings or roof linings, equipment and instruments used for working on fish products must be kept in a satisfactory state of cleanliness and repair, so that they do not constitute a source of contamination for the products.

B.1.12 Detergents, disinfectants and similar substances must be approved by the competent authority and used in such a way that they do not have adverse effects on the machinery, equipment and products.

B.2 General conditions of hygiene applicable to staff

B.2.1 The highest possible standard of cleanliness is required of staff. More specifically:

B.2.2 Staff must wear suitable clean working clothes and headgear which completely encloses the hair. This applies particularly to persons handling exposed fish and fish products;

B.2.3 Staff assigned to the handling and preparation of fish products must be required to wash their hand;

B.2.4 at least each time work is resumed; wounds to the hands must be covered by a waterproof dressing;

B.2.5 Smoking, spitting, eating and drinking in work and storage premises of fish products must be prohibited.

B.3 Special conditions for handling fresh fish

B.3.1 They shall have been handled and, where appropriate, packaged, prepared, processed, or stored hygienically in establishments approved in accordance with the provisions of this draft standard.

B.3.2 Where chilled, unpacked products are not dispatched, prepared or processed immediately after reaching the establishment, they must be stored or displayed under ice in the establishment's cold room. Re-icing must be carried out as often as is necessary; the ice used, with or without salt, must be made from drinking water and be stored under hygienic conditions in receptacles provided for the purpose; such receptacles must be kept clean and in a good state of repair. Pre-packed fresh products must be chilled with ice or mechanical refrigeration plant creating similar temperature conditions.

B.3.3 Operations such as heading and gutting must be carried out hygienically as outlined in this draft standard. The products must be washed thoroughly with drinking water immediately after such operations.

B.3.4 Operations such as filleting and slicing must be carried out in such a way as to avoid the contamination or spoilage of fillets and slices, and in a place other than that used for heading and gutting operations 'Fillets and slices must not remain on work tables any longer than is necessary for their preparation and must be protected from contamination by appropriate packaging.' Fillets and slices to be sold fresh must be chilled as quickly as possible after preparation.

B.3.5 Guts and parts that may constitute a danger to public health must be separated from and removed from the vicinity of products intended for human consumption.

B.3.6 Containers used for the dispatch or storage of fresh fish products must be designed in such a way as to ensure both their protection from contamination and their preservation under sufficiently hygienic conditions and, more particularly, they must provide adequate drainage of melt water.

B.3.7 Unless special facilities are provided for the continuous disposal of waste, the latter must be placed in leakproof, covered containers which are easy to clean and disinfect. Waste must not be allowed to accumulate in working areas.

B.3.8 Suitable vehicles and containers licensed by competent authorities.

THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards is the standardizing body in Malawi under the aegis of the Ministry of Industry and Trade. Set up in 1972 by the Malawi Bureau of Standards Act (Cap: 51:02), the Bureau is a parastatal body whose activities aim at formulating and promoting the general adoption of standards relating to structures, commodities, materials, practices, operations and from time to time revise, alter and amend the same to incorporate advanced technology.

CERTIFICATION MARK SCHEME

To bring the advantages of standardization within the reach of the common consumer, the Bureau operates a Certification Mark Scheme. Under this scheme, manufacturers who produce goods that conform to national standards are granted permits to use the Bureau's "Mark of Quality" depicted below on their products. This Mark gives confidence to the consumer of the commodity's reliability



