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**DRAFT MALAWI STANDARD
(COMESA AND SADC HARMONIZED)**

Quick frozen fish fillets – Specification

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

Quick frozen fish fillets – Specification

DRAFT MALAWI STANDARD FOR PUBLIC REVIEW

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TABLE OF CONTENTS

Contents	Page
Foreword.....	i
Technical Committee	i
Notice.....	ii
Scope.....	1
Normative references	1
Terms and definitions	2
Description.....	2
Essential composition and quality factors.....	3
Food additives	4
Contaminants.....	4
Hygiene.....	4
Packaging and labeling.....	5
Methods of sampling and tests.....	5
Defects.....	6
Lot acceptance	7
Annex A; Sensory and physical examination	8

FOREWORD

This draft standard is a Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC) Harmonized Text, covering the requirements and methods of tests for quick frozen fish fillets.

The harmonization of standards and technical regulations in the COMESA is an obligation under the COMESA Treaty in order to promote the achievement of the aims and objectives of the Common Market as set out in Article 3 of COMESA Treaty.

In SADC, harmonization of standards and technical regulations is also an obligation under the SADC Trade Protocol which was established under the SADC Treaty to provide elimination of tariffs and non-tariff barriers to trade.

This draft standard is identical to the following standards:

CODEXSTAN 190:1995, *Codex standard for quick frozen fish fillets*, which was adopted by COMESA, except for the inclusion of the microbiological limits (clause **5.4**); and

SADC HT 83, *General standard for quick frozen fish fillet*.

Acknowledgement is made for the use of the above standards.

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

Quick frozen fish fillets - Specification

1 SCOPE

This draft standard specifies applies to quick frozen fillets of fish as defined below and offered for direct consumption without further processing. It does not apply to products indicated as intended for further processing or for other industrial purposes.

2 NORMATIVE REFERENCES

The following standards 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;* and

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 TERMS AND DEFINITIONS

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

3.1

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

3.2

foreign matter

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

3.3

fresh whole fish

fish harvested while alive from culture, immediately cleaned and/or chilled to preserve freshness

3.4

veterinary drug

any substance applied or administered to fish, whether used for therapeutic, prophylactic, or diagnostic purposes or for modification of physiological functions or behaviour.

3.5

lot

fish from the same origin and harvest

3.6

sound

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

4 DESCRIPTION

4.1 Product definition

Quick frozen fillets are slices of fish of irregular size and shape which are removed from the carcass of the same species of fish suitable for human consumption by cuts made parallel to the backbone and sections of such fillets cut so as to facilitate packing, and processed in accordance with the process definitions given in section 4.2.

4.2 Process definition

4.2.1 The product after any suitable preparation shall be subjected to a freezing process and shall comply with the conditions laid down hereafter. The freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18 °C (0 °F) or colder at the thermal centre after thermal stabilization. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution.

4.2.2 These products shall be processed and packaged so as to minimize dehydration and oxidation.

4.2.3 The recognized practice of repacking quick frozen products under controlled conditions which will maintain the quality of the product, followed by the reapplication of the quick freezing process as defined, is permitted.

4.3 Presentation

4.3.1 Any presentation of the product shall be permitted provided that it:

- (a) Meets all requirements of this draft standard, and
- (b) Is adequately described on the label to avoid confusing or misleading the consumer.

4.3.2 Fillets may be presented as boneless, provided that deboning has been completed including the removal of pin-bones.

5 ESSENTIAL COMPOSITION AND QUALITY FACTORS

5.1 Raw material

Quick frozen fish fillets shall be prepared from sound fish which are fit to be sold fresh for human consumption.

5.2 Glazing

If glazed, the water used for glazing or preparing glazing solutions shall be of potable quality or shall be clean fresh or sea-water. Potable water is fresh-water fit for human consumption. Standards of portability shall not be less than those contained in the latest edition of MS 214 or the WHO guidelines for drinking water.

Note: Clean sea-water is sea-water which meets the same microbiological standards as potable water and is free from objectionable substances.

5.3 Other ingredients

All other ingredients used shall be of food grade quality and conform to all applicable Malawi or International Standards

5.4 Microbiological limits

5.4.1 The product shall comply with microbiological limits given in Table 1.

Table 1: Microbiological limits for quick frozen fish fillets

1	2	3	4
SL No	Micro-organisms	Max. limits	Method of test
i)	<i>Salmonella</i> per 25 g	Absent	ISO 6579
ii)	<i>E. coli</i> per gram	Absent	ISO 7251
iii)	<i>listeria monocytogenes</i>	Absent	ISO 11290
iv)	<i>Staphylococcus aureus</i> cfu per gram	10 ²	ISO 6888
v)	<i>Clostridium perfringens</i> per gram	Absent	ISO 7937
vi)	<i>Vibrio Spp</i> per gram	Absent	ISO 21872
vii)	Total viable count per gram	10 ⁵	ISO 4833

5.5 Final product

Products shall meet the requirements of this draft standard when lots are examined in accordance with section 10.

6 FOOD ADDITIVES

In addition to preservatives listed in Table 1, additives used in the products covered by this draft standard shall comply with MS 237.

Table 1: Preservatives for quick frozen fish fillets

1	2	3	4
S/No	Name of preservative	INS Number	Maximum level in the final product
1	Monosodium orthophosphate	339 (i)	10 g/Kg, singly or in combination expressed as P ₂ O ₅ (includes natural phosphate)
2	Monopotassium orthophosphate	340 (i)	
3	Tetrapotassium orthophosphate	450 (iii)	
4	Pentasodium triphosphate	450 (v)	
5	Pentapotassium triphosphate	451 (i)	
6	Sodium polyphosphate	452 (i)	
7	Calcium, polyphosphates	452 (iv)	
8	Sodium alginate	401	GMP
9	Sodium ascorbate	301	GMP
10	Potassium ascorbate	303	GMP

7 CONTAMINANTS

7.1 Quick frozen fish fillets shall conform to those maximum levels for heavy metals and other contaminants as stipulated in MS 302.

7.2 The products shall not contain more than 10 mg/100 g of histamine based on the average of the sample unit tested. This shall apply only to species of *Clupeidae*, *Scombridae*, *Scombresocidae*, *Pomatomidae* and *Coryphaenidae* families.

8 HYGIENE

8.1 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, MS 790 and CAC/RCP 8.

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

9 PACKAGING AND LABELLING

9.1 Packaging

Quick frozen fish fillets 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 product shall be "fillets or fillets of...";

9.2.2 Storage and transportation conditions declaring the temperature to be -18 °C or lower;

9.2.3 Name and physical address of processor;

9.2.4 Net weight in metric units;

9.2.5 Date of production;

9.2.6 Batch or code number;

9.2.7 Expiry date;

9.2.8 Country of origin and/or water body; and

9.2.9 The term "quick frozen" shall also appear on the label.

9.3 Labelling of non-retail containers

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.

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 METHOD OF SAMPLING AND TEST

10.1 Sampling

10.1.1 Sampling of lots for examination of the product shall be in accordance with the CODEX STAN 233.

Note: A Sample unit is the primary container or for individually quick frozen products is at least a 1 kg portion of the sample unit.

10.1.2 Sampling of lots for examination of net weight shall be carried out in accordance with an appropriate sampling plan meeting the criteria established by the Codex Alimentarius Commission.

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 Annex A and MS 1247.

10.3 Determination of net weight

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

10.3.2 Determination of net weight of products covered by glaze; as soon as the package is removed from low temperature storage, open immediately and place the contents under a gentle spray of cold water. Agitate carefully so that the product is not broken. Spray until all ice glaze that can be seen or felt is removed. Remove adhering water by the use of paper towel and weigh the product in a tared pan.

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

The entire sample unit is examined non-destructively by placing appropriate portions of the thawed 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

Gelatinous condition of fillets shall be determined by AOAC 950.46.

10.6 Cooking methods

The following procedures are based on heating the product to an internal temperature of 65 – 70 °C. The product must not be overcooked. Cooking times vary according to the size of the product and the temperatures used. The exact times and conditions of cooking for the products should be determined by prior experimentation.

10.6.1 Baking Procedure: Wrap the product in aluminum foil and place it evenly on a flat cookie sheet or shallow flat pan.

10.6.2 Steaming Procedure: Wrap the product in aluminum foil and place it on a wire rack suspended over boiling water in a covered container.

10.6.3 Boil-in-Bag Procedure: Place the product in a boilable film-type pouch and seal. Immerse the pouch in boiling water and cook.

10.6.4 Microwave Procedure: Enclose the product in a container suitable for microwave cooking. If plastic bags are used, check to ensure that no odour is imparted from the plastic bags. Cook according to equipment instructions.

10.7 Determination of histamine

Histamine shall be determined using AOAC 977.13.

11 DEFECTS

A sample unit shall be considered as defective when it exhibits any of the properties defined below:

11.1 Dehydration

Greater than 10 % of the surface area of the sample unit or for pack sizes described below, exhibits excessive loss of moisture clearly shown as white or yellow abnormality on the surface, which masks the colour of the flesh and penetrates below the surface, and cannot be easily removed by scraping with a knife or other sharp instrument without unduly affecting the appearance of the product.

1	2
Pack Size	Defect Area
≤200 g units	≥25 cm ²
201 - 500 g units	≥ 50 cm ²
501 - 5000 g units	≥150 cm ²

11.2 Foreign matter

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

11.3 Parasites

The presence of two or more parasites per kg of the sample unit with a capsular diameter greater than 3 mm or a parasite not encapsulated and greater than 10 mm in length.

11.4 Bones (in packs designated boneless)

More than one bone per kg of product greater or equal to 10 mm in length, or greater or equal to 1 mm in diameter; a bone less than or equal to 5 mm in length, is not considered a defect if its diameter is not more than 2 mm. The foot of a bone (where it has been attached to the vertebra) shall be disregarded if its width is less than or equal to 2 mm.

11.5 Odour and flavour

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

11.6 Flesh abnormalities

A sample unit affected by excessive gelatinous condition of the flesh together with greater than 86 % moisture found in any individual fillet or a sample unit with pasty texture resulting from parasitic infestation affecting more than 5 % of the sample unit by weight.

12 LOT ACCEPTANCE

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

- (i) The total number of "defects" as classified according to section 11 does not exceed the acceptance number (c) of the appropriate sampling plan in the CODEX STAN 233.
- (ii) the average net contents of all containers examined is not less than the declared weight, provided there is no unreasonable shortage in any containers;
- (iii) The food additives, hygiene and handling and the labelling requirements of clauses 6, 7, 8 and 9 are met.

ANNEX A
(Normative)

SENSORY AND PHYSICAL EXAMINATION

1. Complete net weight determination, according to defined procedures in clause **10.3** (de-glaze as required).
2. Examine the frozen fillets for the presence of dehydration by measuring those areas which can only be removed with a knife or other sharp instrument. Measure the total surface area of the sample unit, and calculate the percentage affected.
3. Thaw and individually examine each fillet in the sample unit for the presence of foreign matter, parasites, bone where applicable, odour, and flesh abnormality defects.
4. In cases where a final decision on odour cannot be made in the thawed 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 **10.6**.
5. In cases where a final decision on gelatinous condition cannot be made in the thawed uncooked state, the disputed material is sectioned from the product and gelatinous condition confirmed by cooking or by using the procedure in section **10.5** to determine if greater than 86 % moisture is present in any fillet. If a cooking evaluation is inconclusive, then the procedure in **10.5** would be used to make the exact determination of moisture content.

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



