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DMS 745: 2021
Second edition

DRAFT MALAWI STANDARD

Mayonnaise – Specification

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

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Mayonnaise – Specification

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FOREWORD

This draft Malawi standard has been prepared by MBS/TC 8, the Technical Committee on *Spices, condiments and culinary herbs,* to provide requirements for mayonnaise.

This draft Malawi standard is the first revision of the standard MS 745 , *Mayonnaise – Specification* which was first published in 2014.

This draft Malawi standard is based on the following standards;

Uganda Standard US 51:2020*, Mayonnaise – Specification*; and

Rwanda Standard RS 371: 2017, *Mayonnaise – Specification.*

Acknowledgement is made for the use of the information.

TECHNICAL COMMITTEE

This standard was prepared by MBS/TC 8, the Technical Committee on *Spices,condiments and culinary herbs* and the following companies, organizations and institutions were represented:

Blantyre City Council;
Consumers Association of Malawi;
Lilongwe University of Natural Resources;
Malawi Bureau of Standards;
Malawi University of Business and Applied Science;
Ministry of Health – Blantyre District Health Office;
Nali Limited;
Peoples Trading Center;
Rab Processors Limited;
Rambo Packaging;
Shoprite Trading; and
Tajo Products.

NOTICE

This standard shall be reviewed every five years, or earlier whenever 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

Mayonnaise – Specification

1 SCOPE

This draft Malawi standard specifies the requirements, sampling and methods of test, for mayonnaise intended for human consumption.

2 NORMATIVE REFERENCES

The following standard contains provisions, which through reference in this text, constitute provisions of this draft Malawi 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 Malawi 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 11: *Artificial vinegar – Specification;*

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

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

MS 51*: Fortified edible oils – Specification;*

MS 188: *Edible salt – Specification;*

MS 202: *Fortified white sugar – Specification;*

MS 214: *Drinking water – Specification;*

MS 237: *Food additives – General standard;*

MS 302: *Contaminants and toxins in food;*

MS 624: *Nutrition labelling – Guidelines;*

MS 625: *Nutrition claims – Guidelines;*

MS 935*: Principles for the establishment and application of microbiological criteria for foods*;

MS 1516: *Code of hygienic practice for egg and egg products;*

MS 1635: *Fruit and vegetable products – Determination of pH;*

ISO 1738: *Butter – Determination of salt content;*

ISO 661: *Animal and vegetable fats and oils – Preparation of test sample;*

ISO 3960: *Animal and vegetable fats and oils – Determination of peroxide value – Iodometric (visual) endpoint determination*;

ISO 5555:*Animal and vegetable fats and oils – Sampling;*

ISO 8294*: Animal and vegetable fats and oils – Determination of copper, iron and nickel contents – Graphite furnace atomic absorption method*;

ISO 17189: *Butter, edible oil emulsions and spreadable fats – Determination of fat content (Reference method)*;

AOAC 950.17, *Official Method Citric Acid in non-alcoholic Beverages*;

3 TERMS AND DEFINITIONS

For the purposes of this document, the following terms and definitions apply

3.1
Mayonnaise
condiment sauce obtained by emulsifying edible vegetable oil(s) in an aqueous phase consisting of vinegar, the oil-in-water emulsion being produced by the hens' egg yolk.

3.2
Emulsion
mixture of two or more liquids that are normally immiscible (not forming a homogenous or unblendable). It is to be used when both phases, dispersed and continuous, are liquids. One liquid (the dispersed phase) is dispersed in the other (the continuous phase)

3.3
Emulsifier
substance that stabilizes an emulsion by increasing its kinetic stability. These compounds typically have a polar or hydrophilic (i.e. water-soluble) part and a non-polar or lipophilic part. Because of this, they tend to have more or less solubility either in water or in oil. The more soluble in water (and conversely, less soluble in oil) will generally form oil-in-water emulsions, while those that are more soluble in oil will form water-in-oil emulsions

3.4
texture
sensory perception of the structure of a food

3.5
phase inversion
phenomenon that occurs when agitated oil in water emulsion, reverts to a water in oil and vice versa

3.6
Vinegar
liquid, fit for human consumption, produced exclusively from suitable products containing starch and/or sugars by the process of double fermentation, first alcoholic and then acetous

3.7
organoleptic
qualities (such as taste, colour, odour, and feel) of mayonnaise that stimulate the sense organs involving the use of the sense organs

3.8
winterized oil
oil which has the higher-melting glycerides removed by slow cooling , filtration or centrifuging. So that the oil in the mayonnaise does not separate out when refrigerated

3.9
low fat mayonnaise
produced by decreasing the dispersed phase (oil) and increasing the aqueous phase. Using fat replacer is recommended to decrease fat content

3.10
Condiment
spice, sauce, or preparation that is added to food, typically after cooking, to impart a specific flavour, to enhance the flavour, or to complement the dish

4 Description

Mayonnaise is a condiment sauce obtained by emulsifying edible vegetable oil(s) in an aqueous phase consisting of vinegar, the oil-in-water emulsion being produced by the hens' egg yolk. Mayonnaise may also contain optional ingredients. The egg York contains lecithin, a fat emulsifier that serves as a stabilizer between the two liquids.
High quality mayonnaise has a firm texture and a small droplet size. Mayonnaise reaches a peak in texture and a minimum in droplet size during mixing. At longer mixing times the quality decreases and the mayonnaise becomes over-sheared. When the ingredients are cold and a high amount of egg yolk is used, mayonnaise with a high quality can be made.

Mayonnaise with an increased oil content has a firmer texture but is also more sensitive to over-shear. Full-fat mayonnaise contains around 65 to 80 %. The oil is dispersed in a water phase to form an oil-in-water (O/W) emulsion. A low viscosity characterizes phase inversed mayonnaise, or broken mayonnaise, which is close to the viscosity of oil resulting in a water-in-oil (W/O) emulsion.

Low or reduced-fat mayonnaise, on the other hand, is a growing market, with continually reducing oil content while maintaining similar product taste and texture. As the oil is present in levels of at least 30 to 60 % by weight in light or low calorie mayonnaise, substantial reformulation is necessary in order to produce a mayonnaise product with less than 5 % by weight vegetable oil.

5 ESSENTIAL COMPOSITION AND QUALITY CRITERIA

5.1 General requirements

Mayonnaise shall have the following characteristics;

5.1.1 The texture of the product shall be semisolid, uniform, smooth and free from lumps due to poor manufacturing;

5.1.2 It shall be free from impurities and foreign materials, rancidity and any other foreign flavours;

5.1.3 It shall be free from animal fats and oils;

5.1.4 The taste of mayonnaise shall be characteristic of mayonnaise;

5.1.5 Bubbles of oil shall be small and uniform in size; and

5.1.6 Egg white content shall not be more than 20% and the egg yolk shall not be less than 6% in accordance with MS 1516.

5.2 Raw materials

5.2.1 All ingredients shall be of sound quality and fit for human consumption and shall comply with the requirements of the relevant standards.

5.2.2 Water used shall comply with the requirements laid down in MS 214.

5.2.3 Eggs and egg products shall be from the poultry birds, unless otherwise specified.

5.2.4 Ingredients added to impart a characterizing flavour to the products shall be used in quantities sufficient to influence significantly the organoleptic properties of the product.

5.2.5 Raw materials shall be stored, treated and handled under suitable conditions to maintain their chemical and microbiological characteristics.

5.3 Essential ingredients

Mayonnaise shall consist of the following essential ingredients, which shall be of sound quality and fit for human consumption:

a) Potable water complying with MS 214;

b) Acidifying agents such as lemon juice or vinegar complying with MS 11;

c) Edible vegetable oils complying with MS 51;

d) Egg white;

e) Pasteurised egg yolk; and

f) Food grade salt complying with MS 188.

5.4 Optional ingredients

Other ingredients which may be used include but are not limited to the following:

a) Sugar complying with MS 202;

b) Condiments, spices, herbs complying with relevant Malawi standards;

c) Fruits and vegetables including fruit juice and vegetable juice with relevant Malawi standards;

d) Mustard;

e) Dairy products complying with relevant Malawi standards.

5.6 Specific requirements

Mayonnaise shall comply with the specific requirements stipulated in **Table 1**.

Table 1 – Specific requirements for mayonnaise

S/N	Characteristics	Requirement	Test method
i	Total fat % m/m min	70	ISO 17189
ii	Total acidity as acetic acid, %, m/m	0.3-1.5	AOAC 950.17
iii	pH, max	4	MS 1635
iv	Salt (sodium chloride) min, %, m/m	1	ISO 1738
v	Iron content, mg/kg	1.5-5.0	ISO 8294
vi	Peroxide value, milliequivalents of peroxide oxygen/kg, max.	10	ISO 3960
vii	Edible vegetable oil% (m/m), max	50	Annex A

5.7 Microbiological requirements

Mayonnaise shall conform to microbiological limits in **Table 2**.`

Table 2 – Microbiological requirements for mayonnaise

S/N	Microorganisms	Limit	Test method
i	Total viable count, *CFU/g, max.*	10^4	IS0 4833-1
ii	Escherichia. coli, *CFU/g, max.*	absent	ISO 16649-1
iii	Salmonella spp, *CFU/25 g, max*.	absent	IS0 6579-1
iv	Staphylococcus aureus, *CFU/g, max.*	absent	IS0 6888-1
v	Yeast and moulds, *CFU/g max.*	100	ISO 21527

6 FOOD ADDITIVES

Only those food additives listed under this product in MS 237 shall be used and only within the limits specified.

7 CONTAMINANTS

7.1 Heavy metals

The products covered by this draft poposal shall comply with the maximum levels for heavy metals as stated in MS 302.

7.2 Pesticide residues

The products covered by this draft Malawi standard shall comply with the maximum pesticides residue limits established by the Codex Alimentarius Commission.

8 HYGIENE

8.1 It is recommended that the products covered by the provisions of this draft Malawi standard shall be prepared and handled in accordance with the appropriate sections of MS 21, and other relevant Codex texts.

8.2 The produce shall comply with any microbiological criteria established in accordance with MS 935.

9 PACKAGING AND LABELLING

9.1 Packaging

The products covered by the provisions of this standard shall be packed in containers which ensure the hygienic quality and the other qualities of the food.

9.2 Labelling

In addition to the provisions of MS 19, the following specific provisions shall apply:

9.2.1 The name of the food

9.2.1.1 Products complying with provisions of this standard shall be designated “mayonnaise”.

9.2.1.2 Where an ingredient has been added which imparts a special or characteristic flavour to the product, this shall be indicated by an appropriate term in conjunction with or in close proximity to the name of the food.

9.2.2 Nutrition labelling and nutrition claims

Nutritional labelling and nutrition claims shall be done according to the provisions prescribed in MS 624 and MS 625.

9.2.3 List of ingredients in descending order;

9.2.4 Net contents;

9.2.5 Name and address manufacturer/importer;

9.2.6 Country of origin;

9.2.7 Date of manufacture and best before date;

9.2.8 Batch number; and

9.2.9 Instructions on use including the storage of the product after the package has been opened.

9.2.10 Labelling of non-retail containers

When labelling non-retail packages, information for non-retail packages shall be given either on the packages or in enclosed documents, except that the name of the produce, lot identification and the name and address of the manufacturer or packer shall appear on the package.

10 METHOD OF SAMPLING

Sampling and sample preparation for testing shall be carried out in accordance ISO 661 and ISO 5555 respectively

ANNEX A
(Normative)

DETERMINATION OF OIL

A.1. Pre-Extraction

As high fat levels can prevent effective hydrolysis; samples with 10 per cent content shall be pre extracted with the same type of solvent as used in the final extraction.

A.1.1 Requirements

Basic laboratory apparatus.

A.1.2 Procedure

A.1.2.1 Weigh in the sample with a precision of 1000 ± 2 mg. Load the glass thimble with 1 g celite and the sample. Do not cover with cotton.

A.1.2.2 Fit adapters on the thimbles, by introducing them into the thimbles in such a way that the circlip is compressed progressively into the thimble, (i.e. the closed side of the circlip is pressed in first and then working towards the open side) and insert them into the Soxtec HT extraction unit.

A.1.2.3 Add solvent and extract for 10 minutes in rinsing position.

A.1.2.4 After the extraction, dry the extraction cups in an oven at 100 ºC for 30 minutes. Let them cool down and weigh them. Calculate percentage extracted fat. If the fat content is higher than 20 per cent, it is recommended to use a second extraction cup for the final extraction.

A.1.2.5 Remove the thimble holders from the glass thimbles. Transfer the pre-extracted sample as quantitatively as possible from the glass thimble to a sample tube for acid hydrolysis. Proceed from step 2 of the hydrolysis part.

A.2 Hydrolysis

A.2.1 Procedure

A.2.1.1 Weigh the samples with a precision of 1000 ± 2 mg and transfer them to the sample tubes.

A.2.1.2 Add 1g to 2 g of celite and 100 mL to 120 mL of the acid solution to each sample tube. The level of the acid solution shall be over the top of the cover of the heaters.

A.2.1.3 Insert the tubes into position in the 1047 hydrolyzing unit. Lower the suction tubes to the fume exhaust position by pulling the handle upwards. The Teflon part shall rest on the top of the sample tubes and suction tubes shall be about one centimetre down in the sample tubes.

A.2.1.4 Place the glass thimbles into the thimble supports and insert them into the hydrolyzing unit.

A.2.1.5 Start the water aspirator pump for the fume exhaust system. Open vacuum valves under each thimble. Adjust during boiling for low fume exhaust.

A.2.1.6 Turn on the heater to maximum effect and place the reflector in front of the sample tubes. When the solution starts boiling, adjust to a gently boiling speed with the heater control.

A.2.1.7 At the end of the hydrolyzing period, turn off the heater and remove the reflector.

A.2.1.8 Open the cold-water tap for the condensers (approximately 2 L/min).

A.2.1.9 Pull down the suction tube handle. Dilute the acid solution in each tube with some 100 mL of 20 ºC to 25 ºC-distilled water. Close the vacuum valve under each thimble.

A.2.1.10 Lower the suction tubes. Open the vacuum valve under one thimble and suck up the sample solution and as much as possible of the solid particles in the solution. Close the valve and repeat in the same way with the rest of the tubes.

A.2.1.11 Wash each tube by opening the vacuum valve and spray 5 mL x 50 mL of approximately 50 ºC distilled water, by using the water sprayer.

A.2.1.12 Raise the suction tubes and take out one of the sample tubes. Cover the cleaning rod with a thin layer of deflated cotton wool and wet it with acetone. Clean the inside of the tubes by gently pushing and pulling the cleaning rod up and down in the tube. Take a small piece of the cotton wool and clean the outside of the suction tube if necessary. Place each pad of the cotton wool on the top of the sample residue in the glass thimble.

A.3 Drying

A.3.1 To make the wet sample residue hyophilic and achieve effective solvent extraction, the residue and thimble must be dried.

a) Alternative 1: Dry overnight at 60 ºC to 80 ºC in an oven; and

b) Alternative 2: Dry in a microwave oven with turntable at medium power for 30 min to 60 min.

A.3.2 Most samples can be dried in a microwave oven, except meat and fish products.

A.4 Procedure for Solvent Extraction

A.4.1 Fit the adapters, as in **A1.2.2**, to each thimble and insert them into the Soxtec HT extraction unit.

A.4.2 Extract and analyse the samples according to the Soxtec HT extraction unit instructions (see Soxtec HT manual).

A.5 Calculation

A.5.1 Calculate the fat content according to the formula below.

$$per\ cent\ fat\ = \left(\frac{W_3\ - W_2}{W_1}\right) \times 100$$

Where,

W_3 is the extraction cup weight after fat extraction and cooling in a desiccator;

W_2 is the weight for the clean and pre-dried extraction cup; and

W_1 is the sample weight.

A.5.2 If a pre-extraction is required, using two extraction cups, add the two results that have been calculated, and the sum is the total fat in the sample.

$$per\ cent\ fat/\ oil\ =\ F_1\ +\ F_2$$

Where,

F_1 is the fat content after pre-extraction; and

F_2 is the fat content in final extraction.

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THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards is the standardizing body in Malawi under the aegis of the Ministry of Industry. 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.