

**ICS 67.200.10**

**DMS 51:2018**  
Fourth edition

**DRAFT PROPOSAL**

# **Fortified edible oils – Specification**

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

# Fortified edible oils – Specification

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## FOREWORD

This draft Malawi standard is the fourth edition of MS 51, *Fortified edible oils – Specification*. The revision of this standard has been done to incorporate contemporary information prevalent now due to technological and environmental changes. This standard specifies requirements for fortified refined edible oils without considering the crude oils after consideration of health hazards that may result from consumption of crude edible oils.

In preparing this standard reference was made to the following standards:

CODEX STAN 19:2017, *General standard for edible fats and oils*.

South African Standard, SANS 1875:2007, *Edible Oils – Specification*.

Acknowledgement is made for the use of the information.

This draft Malawi standard once approved will cancel and replace the following Malawi standards which have been reviewed and combined in the current draft:

MS 77:1988, Groundnut oil – Specification;

MS 78:1988, Refined sunflower oil – Specification;

MS 79:1988, Refined cottonseed oil – Specification;

MS 80:1988, Rape seed oil – Specification; and

MS 157:1988, Refined soya bean oil – Specification.

## TECHNICAL COMMITTEE

In preparing this draft Malawi standard, the following companies and organisations in the MBS/TC 14, *Edible oils and fats* were represented:

Blantyre City Assembly;

Capital Oil Refining Industries;

Consumers Association of Malawi;

Lilongwe University of Agriculture and Natural Resources (LUANAR);

Malawi Bureau of Standards;

Ministry of Health and population;  
Mount Meru Millers Limited;  
Moti Oil Mill Limited;  
Peoples Trading Centre;  
Rab Processors Limited;  
SAFA Foods Limited;  
Sunseed Oil Limited;  
Universal Industries Limited; and  
University of Malawi – The Malawi Polytechnic.

**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.*

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## DRAFT PROPOSAL

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# Fortified edible oils – Specification

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## 1 SCOPE

**1.1** This draft standard specifies requirements for fortified refined edible oils derived from oil seeds and oil-bearing fruits. These oils are suitable for use as cooking oils and salad oils.

**1.2** This standard excludes the use of crude oils i.e. crude oils shall not be sold for human consumption.

## 2 NORMATIVE REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this 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 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: *Code of hygienic conditions for food and food processing units;*

MS 56: *Edible fats and oils – Methods of test;*

MS 237: *Food additives – General standard;*

MS 302: *Contaminants and toxins in foods – General standard;*

MS 624: *Nutrition labelling – Guidelines;*

MS 625: *Nutrition claims – Guidelines;*

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

CAC/GL 23: *Guidelines for use of nutrition and health claims.*

## 3 TERMS AND DEFINITIONS

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

### 3.1

#### **defective batch**

batch which has failed to meet the quality requirements outlined in this draft standard

### 3.2

#### **edible oils**

are those oils composed of glycerides of fatty acids of vegetable origin and in which naturally occurring lipids, such as phosphatides of unsaponifiable constituents and of free fatty acids may be present

### 3.3

#### **fatty acids**

straight-chain compounds found in oils and ranging from two to twenty-four carbons. They can be either saturated, i.e. containing no double bonds, or unsaturated, i.e. containing double bonds

### **3.4**

#### **food fortification**

practice of deliberately adding essential micronutrients in a food to improve the nutritional quality of the food and to provide a public health benefit with minimal risk to health

### **3.5**

#### **fortificant**

a compound which contains the specified micronutrient intended to be added to a food vehicle

### **3.6**

#### **fortified edible oils**

edible oils containing added micronutrients in accordance with this draft standard

### **3.7**

#### **free fatty acids**

acids which are broken free from a triglyceride molecule

### **3.8**

#### **glyceride**

compounds consisting of one molecule of glycerol and one to three molecules of fatty acids

### **3.9**

#### **lipids**

are esters of fatty acids with glycerol to form monoglycerides, diglycerides or triglycerides, including esters of fatty acids with different alcohols and a variety of substances such as phosphatides, sterols, terpenes, fatty alcohols, fatty acids, fat-soluble vitamins and hydrocarbons, i.e. waxes

### **3.10**

#### **phosphatides**

are triglycerides with two fatty acid chains and one phosphoric acid residue to which may be attached a base

### **3.11**

#### **pre-blend**

mixture of premix with edible oil to dilute fortificant before adding to full amount of oil; prepared to facilitate homogenous mixing

### **3.12**

#### **premix**

blend of fortificants and diluents formulated to provide specified and determinable amounts of micronutrients

### **3.13**

#### **refined oils**

edible oils obtained by mechanical procedures and/or solvent extraction and subjected to refining processes to adopt it especially for use in food products

## **4 ESSENTIAL COMPOSITION AND QUALITY FACTORS**

### **4.1 Raw materials**

Raw materials for fortified edible oils shall be obtained from plant sources of wholesome quality fit for human consumption.

### **4.2 Colour**

The colour of the product shall be characteristic of designated product.

### **4.3 Odour and taste**

The odour and taste of the product shall be characteristic to the designated product and free from foreign and rancid odour and taste. The product shall be free from musty or other unpleasant odour characteristic of bad quality oils. The oils shall be wholesome, with pleasant odour characteristic of good quality fortified edible oils fit for human consumption.

#### 4.4 Physical and chemical requirements for fortified edible oils

Fortified edible oils shall conform to the maximum levels for physical and chemical requirements indicated in Table A1.

### 5 FORTIFICATION REQUIREMENTS

#### 5.1 Addition of vitamin A

All fortified edible oils shall contain vitamin A at the levels provided in Table 1. These levels shall be applied to fortified edible oil during production and importation.

**Table 1 – Fortification requirements at production and during importation**

Nutrient	Fortification compound	Factory addition level (mg/kg)	Tolerable range at factory or site of import (mg/kg)		
			Minimum	Average	Maximum
Vitamin A	Retinyl Palmitate (Oily)	35.0	30.0	35.0	40.0

#### 5.2 Fortification requirements during marketing

It is recognized that some losses in vitamin A may occur during marketing and so the levels to be applied at retail take into account these losses. The regulatory levels at retail are provided in Table 2.

**Table 2 – Fortification requirements during marketing**

Nutrient	Fortification compound	Amount (mg/kg)		Label claim (mg per 100g)
		Minimum	Maximum	
Vitamin A	Retinyl Palmitate (Oily)	20	40	3.0

#### 5.3 Specification of the Vitamin A premix addition levels

**5.3.1** All vitamin premix shall be of acceptable standard and conform to the following standards: United States Pharmacopoeia (USP), British Pharmacopoeia (BP), Food Chemical Codex (FCC), Merck Index (MI), United States National Formulary (NF), European Pharmacopoeia (Ph Eur) and Codex Alimentarius Commission (CAC).

**5.3.2** The premix shall be labelled in accordance with MS 19 and CAC/GL 23.

**5.3.3** The premix shall be diluted to provide pre-blends so that the dilution factor at time of adding pre-blend to oil is reduced. This dilution facilitates good mixing of the vitamin A with the oil to improve homogeneity in the final product. Regardless of the pre-blend formulated, the premix should be added at the rate of 68.6 g to 1 metric ton of oil or 116.7 g to 1 metric ton (Table 3) of oil depending on the concentration used.

**Table 3 – Specification of the Vitamin A premix addition levels**

Nutrient	Premix	Factory addition level (mg/kg)	Amount of premix to be added (g/MT)
Vitamin A	Retinyl Palmitate 1.7 million IU/g	35.0	68.6
	Retinyl Palmitate 1.0 million IU/g	35.0	116.7

## 6 FOOD ADDITIVES

Only those food additives permitted for use in fortified edible oils and as per set maximum levels in MS 237, shall be used.

## 7 CONTAMINANTS

### 7.1 Heavy metals

The products covered by this standard shall comply with the maximum levels for contaminants that are specified for the product in MS 302.

### 7.2 Pesticide residues

Fortified edible oils shall comply with those maximum pesticide residue limits as laid down by the current Codex Alimentarius Commission.

## 8 FOOD HYGIENE

Fortified edible oils shall be prepared and handled under hygienic conditions as prescribed in MS 21. The products should comply with any microbiological criteria established in accordance with MS 935.

## 9 PACKAGING AND LABELING

### 9.1 Packaging

**9.1.1** Fortified edible oil shall be packed in clear sachets or clear bottles or opaque containers that shall not impart any foreign odour or taste to the product or contaminate the product, or be affected by the product.

**9.1.1.1** Clear sachets shall be of food grade plastics and each sachet shall contain net volume of 25 ml to 1000 ml of the fortified edible oil.

**9.1.1.2** Clear bottles shall be of food grade materials and each bottles shall contain net volume of 250 ml to 5 000 ml of the fortified edible oil. The bottles shall be provided with tamper proof seals or closures.

**9.1.1.3** Opaque containers shall be of plastic or metallic food grade materials and each container shall contain net volume of 2 500 ml to 200,000 ml of the fortified edible oil. The containers shall be provided with tamper proof seals or closures.

### 9.2 Labelling

#### 9.2.1 Retail containers

In addition to the provisions of MS 19, the following provisions shall apply on packages of fortified edible oil:

**9.2.1.1 Name of the product.** The name of the product shall be edible 'X' oil or blended 'X' oil where X is the word vegetable or name of such vegetable. The words "*fortified with Vitamin A*" shall be declared in close proximity to the name of the oil. The word "*refined*" shall be declared on the label to indicate the type of oil.

**9.2.1.2 Date marking and storage instructions.** The "*date of minimum durability*" preceded by the words "*best before*" shall be declared. Storage instructions of the product shall be indicated in close proximity to the date marking if the validity of the date depends thereon.

**9.2.1.3 Net content.** The net contents of the product shall be declared by volume in metric units.

**9.2.1.4 Name and address.** The name and address of the manufacturer, packer, distributor, or vendor of the product shall be declared.



**9.2.1.5 Country of origin.** The country of origin of the product shall be declared and shall not be obscured by any outer wrapper.

**9.2.1.6 Lot identification.** Each packaging material shall be permanently marked clearly to identify the producing factory and lot.

**9.2.1.7 List of ingredients.** All ingredients used shall be declared on the label.

**9.2.1.8 Nutrition labelling.** In addition to provisions prescribed in MS 624 the amount of vitamin A in the oil shall be declared on the label in mg per 100 g.

**9.2.1.9 Nutrition and health claims.** Fortified edible oil may have claims on the importance of vitamin A in nutrition and health. Such claims when declared shall be in accordance with MS 625 and CAC/GL 23.

## **9.2.2 Non-retail containers**

The above labelling requirements shall be either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer 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 TEST**

### **10.1 Sampling**

**10.1.1 Sampling for food fortification.** Sampling shall be in accordance with provision in AOAC and the ECSA manual for monitoring of oil fortified with vitamin A.

#### **10.1.2 Sample for incubation at 37 °C**

From the lot take at random the number of containers relative to the lot size in accordance with requirements in column 2 of Table B1.

#### **10.1.3 Sampling for physical, chemical and microbiological requirements.**

For physical, chemical and microbiological examination from the lot take at random the number of containers shown in column 3 of Table B1.

### **10.2 Methods of analysis**

**10.2.1 Methods of analysis for vitamin A.** Determination of the quantity of vitamin A in fortified edible oils shall be undertaken in accordance with the ECSA manual of laboratory methods for fortified foods, Part II Determination of vitamin A in oil.

**10.2.2 Methods of analysis** for physical and chemical requirements shall be done in accordance with MS 56.

**Annex A**  
(Normative)

**Table A1 – Requirements for fortified edible oils**

Common name	Botanical name	Colour, units in 5.25 inch Lovibond cell, max.	Refractive Index	Saponification value mg KOH/g	Unsaponifiable matter, max. % by mass	Iodine value g/100g	Free fatty acids, max % by mass	Moisture and volatile matter, max. % by mass	Peroxide value milliequivalents of active oxygen/kg oil, Max.
Coconut	<i>Cocos nucifera</i> Linnaeus	5 yellow units 2 red units	1.4485 – 1.4500 at 40 °C	248 – 264	8	7 - 11	< 0.15 as lauric acid	0.1	2
Cotton seed	<i>Gossypium spp.</i>	Dependent on gossypol content	1.4580 – 1.4660 at 40 °C	189 – 198	15	100 - 115	< 0.15 as oleic acid	0.1	2
Groundnut (arachis)	<i>Arachis hypogaea</i> Linnaeus	35 yellow units 4 red units	1.4680 – 1.4720 at 20 °C	188 – 196	10	80 - 106	< 0.15 as oleic acid	0.1	2
Maize (corn)	<i>Zea mays</i> Linnaeus	40 yellow units 4 red units	1.4720 – 1.4740 at 20 °C	187 – 195	28	103 - 128	< 0.15 as oleic acid	0.1	2
Palm olein	<i>Elaeis guineensis</i> Linnaeus	3-6 red units	1.4490 – 1.4550 at 50 °C	190 – 209	12	56	< 0.1 as palmitic acid	0.1	2
Palm stearin	<i>Elaeis guineensis</i>	3-6 red units	1.4460 – 1.4520 at 40 °C	188 – 193	12	48	< 0.15 as palmitic acid	0.1	2
Rape (colza) low erucic acid	<i>Brassica napus</i> Linnaeus	40 yellow units 3 red units	1.4650 – 1.4670 at 40 °C	188 – 193	20	110 - 126	< 0.15 as oleic acid	0.1	2
Sunflower	<i>Helianthus annuus</i> Linnaeus	25 yellow units 3 red units	1.4670 – 1.4690 at 40 °C	188 – 194	15	126 - 135	< 0.15 as oleic acid	0.1	2
Soya	<i>Glycine max</i>	Not specified	1.4660 – 1.4700 at 40 °C	189 – 195	15	120 - 143	< 0.15 as oleic acid	0.1	2

**Annex B**  
(Normative)

**Table B1 – Sample sizes**

1	2	3	4	5
Lot size, containers	Sample size for incubation at 37 °C	Sample size for physical examination	Sample size for chemical analysis	Sample size for microbiological examination
0 – 5 000	2 % of the lot size	3	1	3
5 001 – 12 500	2 % of the lot size with a maximum of 200	6	1	3
12 501 – 25 000	2 % of the lot size with a maximum of 200	9	1	3
25 001 – 50 000	2 % of the lot size with a maximum of 200	16	2	3
50 001 upwards	2 % of the lot size with a maximum of 200	30	3	3

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