



## **DRAFT TANZANIA STANDARD**

**Edible Almond oil – Specification**

draft for stakeholders comments

**TANZANIA BUREAU OF STANDARDS**

## 0 Foreword

Edible almond oil is derived from the kernel of almond fruit and is widely used in the food industry. This Tanzania standard lays down specifications aiming at ensuring the safety and quality of edible almond oil produced or traded in the country for human consumption.

In preparation of this Tanzania standard considerable help was derived from:  
CODEX STAN 210 -1999 (Amended 2015) *Codex standard for named vegetable oils* published by Codex Alimentarius Commission

In reporting the results of a test or analysis made in accordance with this Tanzania Standard, if the final value observed or calculated is to be rounded off, it shall be done in accordance with TZS 4.

## 1 Scope

This Tanzania Standard specifies the requirements, sampling and testing methods for almond oil intended for human consumption.

## 2 Normative Reference

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

CODEX STAN 192, *General standards for food additives*

TZS 4, *Rounding off numerical values*

TZS 54, *Animal and Vegetable fats and oils – Sampling*

TZS 76, *Methods for determination of arsenic*

TZS 109, *Food processing units – Code of hygiene — General*

TZS 268, *General atomic absorption – Spectro – Photometric method for determination of lead in food stuffs*

TZS 288-1, *Animal and vegetable fats and oils -- Gas chromatography of fatty acid methyl esters -- Part 1: Guidelines on modern gas chromatography of fatty acid methyl esters*

TZS 288-2, *Animal and vegetable fats and oils -- Gas chromatography of fatty acid methyl esters -- Part 2: Preparation of methyl esters of fatty acids*

TZS 288-3, *Animal and vegetable fats and oils -- Gas chromatography of fatty acid methyl esters -- Part 3: Preparation of methyl esters using trimethylsulfonium hydroxide (TMSH)*

TZS 288-4, *Animal and vegetable fats and oils -- Gas chromatography of fatty acid methyl esters -- Part 4: Determination by capillary gas chromatography*

TZS 538, *Packaging and labeling of foods*

TZS 799, *Foodstuffs – Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products – High\performance liquid chromatographic method*

TZS 1313, *Fortified edible fats and oils —Specification*

TZS 1322, *Oils and fats Sampling and test methods – Purity tests*

TZS 1324, *Animal and vegetable fats and oils – Determination of peroxide value – Iodometric (visual) end point determination*

TZS 1325, *Animal and vegetable fats and oils – Determination of saponification value*

- TZS 1326, *Animal and vegetable fats and oils – Determination of moisture and volatile matter*
- TZS 1327, *Animal and vegetable fats and oils – Determination of iodine value*
- TZS 1328, *Essential oils – Determination of relative density at 20 °C– Reference method*
- TZS 1329, *Animal and vegetable fats and oils – Determination of refractive index*
- TZS 1331, *Animal and vegetable fats and oils – Determination of acid value and acidity*
- TZS 1332, *Animal and vegetable fats and oils – Determination of unsaponifiable matter-method using diethyl ether extraction*
- TZS 1335, *Animal and vegetable fats and oils – Determination of copper, iron and nickel content-graphite furnace atomic absorption*
- TZS 1336, *Animal and vegetable fats and oils – Determination of insoluble impurities content*
- TZS 1369, *Animal and Vegetable fats and oils – Determination of Butylhydroxyanisole (BHA) and Butylhydroxytoluene (BHT) – Gas liquid chromatographic method*
- TZS 1370, *Animal and Vegetable fats and oils – Determination of tocopherol and tocotrienol content by High Performance Liquid Chromatography*
- TZS 1371, *Animal and vegetable fats and oils — Determination of individual and total sterol contents —Gas chromatographic method*
- TZS 1775, *Animal and Vegetable fats and oils — Detection and identification of antioxidants - Thin-layer chromatographic method*

### **3 Terms and definitions**

For the purpose of this document, the following terms and definitions below shall apply:

#### **3.1 edible oils**

food stuffs which are composed of glycerides of fatty acids of vegetable, animal or marine origin which is suitable for human consumption. They may contain small amounts of other lipids such as phosphatides, of unsaponifiable constituents and of free fatty acids naturally present in the oil.

#### **3.2 vegetable oil**

any of a large group of oils that are esters of fatty acids and glycerol, obtained from the leaves, fruit, or seeds of plants.

#### **3.3 edible almond oil**

edible oil derived from the kernel of almond fruit (*Amygdalus communis* L.).

#### **3.4 virgin almond oil**

almond oil obtained, without altering the nature of the oil, by mechanical procedures, for example, expelling or pressing, and the application of heat only. It may have been purified by washing with water, settling, filtering and centrifuging only.

#### **3.5 refined almond oil**

almond oil obtained, by mechanical procedures and/or solvent extraction and subjected to refining processes

## 4 Requirements

### 4.1 General requirements

Edible almond oil shall be free from;

- a) adulterants, sediments, suspended or foreign matter, separated water and added colouring or flavouring substances; and
- b) rancid odour and taste.

### 4.2 Specific requirements

Edible almond oil shall comply with requirements given in table 1 when tested in accordance with the methods specified therein.

**Table 1-Specific requirements for edible almond oil**

S. No.	Parameter	Requirement	Test method
i.	Relative density( at 25 °C/water at 20 °C)	0.911-0.929	TZS 1328
ii.	Refractive index,( ND 20 ° C )	1.468 - 1.475	TZS 1329
iii.	Saponification value, mg KOH/g oil	183 - 207	TZS 1325
iv.	Iodine value (Wij's), g/100	85- 109	TZS 1327
v.	Unsaponifiable matter, g/kg, max.	20	TZS 1332
vi.	Fatty acids composition,%of total fatty acids	As in Annex A	TZS 288
vii.	Moisture and matter volatile at 105 °C, % m/m, max.	0.2	TZS 1326
viii.	Insoluble impurities, % m/m, max.	0.05	TZS 1336
ix.	Free Fatty Acids(FFA) as oleic acid, % m/m, max.	Refined oils: 0.3 Cold pressed and virgin oils: 2.0	TZS 1331
x.	Peroxide value, mEq peroxide- oxygen/kg oil, max	Refined oils :10 Cold pressed and virgin oils: 15	TZS 1324
xi.	Total sterols(mg/kg)	1590-4590	TZS 1371

### 4.3 Food additives

**4.3.1** Refined almond oil may contain food additives in accordance with CODEX STAN 192. However, food additives shall not be used in virgin or cold pressed oils.

**4.3.2** In refined almond oil the additives may be used subject to tables 2, 3, and 4.

## 4.3.2.1 Antioxidant

Table 2 – Requirements for antioxidant in edible almond oil

INS No.	Antioxidant	Requirements	Test method
304	Ascorbyl palmitate, mg/kg, max	500 (singly or in combination)	TZS 1775
305	Ascorbyl stearate , mg/kg, max		
307a	Tocopherol, d- <i>alpha</i> - , mg/kg, max	300 (singly or in combination)	TZS 1370
307b	Tocopherol concentrate, mixed , mg/kg, max		
307c	Tocopherol, dl- <i>alpha</i> , mg/kg, max		
310	Propyl gallate , mg/kg, max	100	TZS 1775
319	Tertiary butyl hydroquinone (TBHQ) , mg/kg, max	120	
320	Butylated hydroxyanisole (BHA) , mg/kg, max	175	TZS 1369
321	Butylated hydroxytoluene (BHT) ,mg/kg,max	75	
Any combination of gallates, BHA, BHT, and/or TBHQ , mg/kg, max		200 within individual limits	TZS 1775
322(i)	Lecithin	GMP	
389	Dilauryl thiodipropionate , mg/kg, max	200	

## 4.3.2.2 Antioxidant synergists

Table 3 —Requirements for antioxidant synergists in edible almond oil

INS No.	Antioxidant synergist	Requirements	Test method
330	Citric acid	GMP	TZS 1775
331(i)	Sodium dihydrogen citrate		
331(iii)	Trisodium citrate		
332(ii)	Tripotassium citrate		
333(iii)	Tricalcium citrate		
384	Isopropyl citrates , mg/kg, max	100 (Singly or in combination)	
472c	Citric and fatty acid esters of glycerol , mg/kg, max		

**4.3.2.3 Antifoaming agents (deep frying oil)**

Antifoaming agents specified in Table 4 may be used.

**Table 4 — Antifoaming agents**

INS No.	Antifoaming agent	Requirements	Test method
900a	Polydimethylsiloxane, mg/kg, max	10	TZS 1775

**4.4 Fortification**

Edible almond oil may be fortified in accordance to TZS 1313.

**5 Hygiene**

Edible almond oil shall be produced, processed, handled and stored in accordance to TZS 109.

**6 Contaminants****6.1 Pesticide residues**

Edible almond oil shall comply with relevant maximum pesticide residue limits established by the Codex Alimentarius Commission.

**6.2 Soap content**

The **soap content shall not exceed 0.005%** when tested according to **TZS 1322**

**6.3. Metals contaminants**

Edible almond oil shall comply with maximum limits established by Codex Alimentarius Commission as specified in Table 5.

**Table 5– Acceptable levels of metal contaminants in edible almond oil**

Characteristics	Maximum level	Test method
Iron (Fe) mg/kg	Virgin 5.0 Refined 1.5	TZS 1335
Copper (Cu) mg/kg	Virgin 0.4 Refined 0.1	TZS 1335
Lead (Pb) mg/kg	0.1	TZS 268
Arsenic (As) mg/kg	0.1	TZS 76

**6.4** Total aflatoxin shall not exceed 10 µg/kg while aflatoxin B1 shall not exceed 5 µg/kg when tested in accordance with TZS 799.

## 7 Sampling and Testing

### 7.1 Sampling

Sampling shall be carried out in accordance with TZS 54 .

### 7.2 Tests

**7.2.1** Testing shall be in accordance with TZS 1322 and as provided in the respective tables and Annexes of this Tanzania Standard.

## 8 Packing, marking and labeling

### 8.1 Packing

Edible almond oil shall be packed in containers made from suitable food grade material

### 8.2 Marking and labeling

Edible almond oil containers shall be marked and labelled in accordance with TZS 538. In addition, each container shall be legibly and indelibly marked with the following information:

- a) Name of the product shall be 'Almond oil'
- b) The words virgin or refined shall be declared on the label to indicate the type of oil
- c) Name, physical and postal address of the manufacturer and/or packer
- d) Date of manufacture and
- e) best before date
- f) Language-Kiswahili and/or English
- g) A complete list of ingredients in descending order of proportion
- h) Net content
- i) Batch number
- j) Manufacturers registered trade mark
- k) Country of origin
- l) The phrase "Place the products away from direct sunlight".
- m) Disposal of used packages
- n) Nutritional Information(optional)

**8.2.2** The containers may also be marked with the TBS Standards Mark of Quality.

**NOTE** - The TBS Mark of Quality shall be used by the packers only under licence from TBS. Particulars of conditions under which the licenses are granted, may be obtained from TBS.

**ANNEX A**  
(normative)  
**fatty acids composition**

Carbon configuration	Fatty acid composition(%)	Test Method
C6:0	ND	TZS 288
C8:0	ND	
C10:0	ND	
C12:0	ND	
C14:0	ND-0.1	
C16:0	4.0-9.0	
C16:1	0.2- 0.8	
C17:0	ND-0.2	
C17:1	ND-0.2	
C18:0	ND-3.0	
C18:1	62.0-76.0	
C18:2	20.0-30.0	
C18:3	ND-0.5	
C 20:0	ND-0.5	
C 20:1	ND-0.3	
C20:2	ND	
C22:0	ND-0.2	
C22:1	ND-0.1	
C22:2	ND	
C24:0	ND-0.2	
C24:1	ND	
<b>NOTE-</b> fatty acid composition is expressed as % of total fatty acids ND-none detectable, defined as ≤0.05		



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