##### DRAFT EAST AFRICAN STANDARD

Edible palm oil — Specification

EAST AFRICAN COMMUNITY

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*East African Community*

*P.O. Box 1096,*

*Arusha*

*Tanzania*

*Tel: + 255 27 2162100*

*Fax: + 255 27 2162190*

*E-mail: eac@eachq.org*

 *Web: www.eac-quality.net*

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

EAS 301 was prepared by Technical Committee EASC/ TC/015, Oil Seeds, Edible Fats and Oils.

This third edition cancels and replaces the second edition (EAS 301:2013), which has been technically revised.

Edible palm oil — Specification

# 1 Scope

This Draft East African standard specifies requirements and methods of sampling and test for virgin and refined edible palm oil derived from fruit (mesocarp) of the palm (Elaeis guineensis).

# 2 Normative references

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.

EAS 38, Labelling of pre-packaged foods — Specification

EAS 39, Code of practice for hygiene for food and drink manufacturing industries

CXS 192-1995, General Standard for food additives

EAS 769, Fortified edible oils and fats — Specification

EAS 804, Claims on foods —Requirements

EAS 805, Use of nutritional and health claims — Requirement

ISO 660, Animal and vegetable fats and oils — Determination of acid value and acidity

ISO 661, Animal and vegetable fats and oils — Preparation of test sample

ISO 662, Animal and vegetable fats and oils — Determination of moisture and volatile matter content

ISO 663, Animal and vegetable fats and oils — Determination of insoluble impurities content

ISO 2590, General method for determining of arsenic — Diethyldithiocarbamate photometric method

ISO 3596, Animal and vegetable fats and oils — Determination of unsaponifiable matter — Method using diethyl ether

ISO 3657, Animal and vegetable fats and oils — Determination of saponification value

ISO 3960, Animal and vegetable fats and oils  Determination of peroxide value — Iodometric (visual) endpoint determination

ISO 3961, Animal and vegetable fats and oils — Determination of iodine value

ISO 5555, Animal and vegetable fats and oils — Sampling

ISO 6320, Animal and vegetable fats and oils — Determination of refractive index

ISO 6883, Animal and vegetable fats and oils — Determination of conventional mass per volume (litre weight in air)

ISO 8294, Animal and vegetable fats and oils — Determination of copper, iron and nickel contents — Graphite furnace atomic absorption method

ISO 10539, Animal and vegetable fats and oils — Determination of alkalinity

ISO 12193, Animal and vegetable fats and oils — Determination of lead by direct graphite furnace atomic absorption spectroscopy

ISO 15305, Animal and vegetable fats and oils — Determination of Lovibond colour

# 3 Terms and definitions

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

3.1

edible palm oil

foodstuff composed primarily of glycerides of fatty acids obtained from fleshy mesocarp of the fruit of the oil palm (Elaels gulneensis). It 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

virgin palm oil

edible 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.

3.3

refined (non–virgin) palm oil

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

3.4

cold pressed palm oil

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

3.5

food grade packaging material

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

# 4 Requirements

## 4.1 General requirements

Edible palm oil shall:

1. be free from adulterants, and any other foreign matter, separated water and added colouring substances;
2. be free from rancid odour and taste; and
3. be free from admixture with other oils, when tested according to appropriate method.

## 4.2 Specific requirements

Edible palm oil shall comply with requirements specified in Table 1. when tested in accordance with the test methods specified therein.

Table 1 ― Specific requirements for edible palm oil

|  |  |  |  |
| --- | --- | --- | --- |
| **S/No.** | **Characteristic** | **Requirement** | **Test method** |
|  | Moisture and matter volatile at 105 oC, % m/m, max. | 0.2 | ISO 662 |
|  | Insoluble impurities, % m/m, max. | 0.05 | ISO 663 |
|  | Acid value, mg KOH/g oil, max | Non virgin oil: 0.6Virgin oil: 10 | ISO 660 |
|  | Soap content, % m/m, max. | 0.005 | ISO 10539 |
|  | Relative density (50 oC/ water at 20 oC ) | 0.891 – 0.899 | ISO 6883 |
|  | Refractive index, 50 oC | 1.454 – 1.456 | ISO 6320 |
|  | Slip melting point, max. | 39 oC | ISO 6321 |
|  | Saponification value (mg KOH/g oil) | 190 – 209 | ISO 3657 |
|  | Iodine value (Wij’s), min. | 45  | ISO 3961 |
|  | Colour, 133.35 mm (5¼ in.) Lovibond | Non-Virgin :≤ 6 R Virgin: ≥ 6 | ISO 15305 |
|  | Unsaponifiable matter, g/kg, max. | 12 | ISO 3596 |
|  | Total carotenoids in virgin palm oil, mg/kg, as Beta carotene | 500 – 2000 | Annex A |
|  | Peroxide value, mEq peroxide oxygen/kg oil, max. | 10 | ISO 3960 |
|  | Iron, mg/kg, max. | Virgin: 5Refined: 1.5 | ISO 8294 |
|  | Copper, mg/kg, max. | Virgin: 0.4Refined 0.1 | ISO 8294 |
|  | Colour, units in a 25.4 mm Lovibond cell, max. | Red: 4Yellow: 50 | ISO 15305 |

### 4.3 Fortification of edible palm oil

Edible palm oil may be fortified in accordance with EAS 769.

# 5 Food additives

**5.1** Virgin or cold pressed palm oils shall not contain food additives

**5.2** Refined palm oil may contain food additives as permitted in CXS 192

# 6 Flavouring agents

Flavouring used in refined edible palm oil shall comply with guidelines for use of flavourings CXG 66-2008.

# 7 Hygiene

Edible palm oil shall be produced, prepared and handled in accordance with EAS 39.

# 8 Contaminants

**8.1 Pesticide residues**

Palm oil shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

**8.2 Heavy metal contaminants**

Edible palm oil shall comply with the maximum limits specified in Table 2.

Table 2 ― Limits for heavy metal contaminants in edible palm oil

|  |  |  |  |
| --- | --- | --- | --- |
| **S/No.** | **Contaminant** | **Maximum limit** | **Test method** |
|  | Lead, mg/kg | 0.08 | ISO 12193 |
|  | Arsenic, mg/kg | 0.1 | ISO 2590 |

# 10 Packaging

Edible palm oil shall be packaged in food grade containers and sealed in manner to ensure the safety and quality requirements specified in this standard are maintained throughout the shelf life of the product.

# 11 Labelling

**11.1** In addition to the labelling requirements in EAS 38 the name of the product shall be ‘palm oil’ and with the description as either:

1. virgin,
2. refined or non-virgin

**11.2 Health and nutrition claims**

Where Health and nutrition claims have been used, they shall be done in accordance to EAS 804 and EAS 805

# 12 Sampling

Sampling shall be carried in accordance with ISO 5555 and samples prepared for testing according to ISO 661.

Annex A
(informative)

Determination of carotene contents

##### A.1 Definition

The carotene of palm oil is defined and calculated as B-carotene in parts per million (ppm)

##### A.2 Principle

Spectrophotometric measurement at 446 nm of the absorbance of a homogenized and diluted sample

##### A.3 Reagent

Trimethylpentane (ISO-octane) or n-hexane, optically pure at 446 nm

##### A.4 Apparatus

A.4.1 Spectrophotometer, with 1 cm quartz cuvettes suitable for measurement at 446 nm

A.4.2 Volumetric flask, 25-mL capacity

A.4.3 Pipette, 5-mL capacity

##### A.5 Preparation of sample

Melt the sample at 60 ºC to 70 ºC and homogenize thoroughly before taking a test portion. Filter through a fast filter paper if the sample contains impurities or is not clear.

##### A.6 Procedure

Weigh, to the nearest 0.0001 g, 0.3 g of the sample into the 25-mL volumetric flask. Dissolve the test portion with a few millilitres of solvent and dilute to the mark.

Pipette accurately 5 mL of the prepared solution into another 25-mL volumetric flask and make up to volume with the same solvent.

Transfer the diluted solution to the 1 cm cuvette and measure the absorbance at 466 nm against the solvent used. Correct for cuvette error at the same wavelength.

##### A.7 Expression of results

The carotene content is expressed as ppm β-carotene and is given by:

Corotene Content = $\frac{478.5(as-ab)}{w}$

where,

as is the absorbance of the sample;

ab is the cuvette error; and

w is the weight, in grams, of sample.

Express the results to the nearest unit.

Annex B
(informative)

GLC fatty acid composition

When required the fatty acid profile should be determined by Gas Liquid Chromatography. Ranges of fatty acids are given in Table B.1 for information.

Table B.1 — GLC fatty acid composition

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Carbon Configuration | C12 | C14:0 | C16:0 | C16:1 | C17:0 | C18:0 | C18:1 | C18:2 | C18:3 | C20:0 | C:21:0 | C22:0 |
| Composition % | 0.5 | 0.5-2.0 | 39.3-47.5 | 0.6 | ND – 0.2 | 3.5-6.0 | 36-44 | 9.0-12 | 0.5 | 1.0 |  |  |