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## **DRAFT EAST AFRICAN STANDARD**

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**Edible macadamia oil — Specification**

**EAST AFRICAN COMMUNITY**

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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.

The committee responsible for this document is Technical Committee EASC/TC 015, *Oilseeds, edible fats and oils*.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

## Edible macadamia oil — Specification

### 1 Scope

This draft East African Standard specifies requirements, sampling and test methods for virgin and refined macadamia oil derived from the kernel of the macadamia nuts of varieties grown from *Macadamia integrifolia* and *Macadamia tetraphylla* and their hybrids intended for human consumption.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all 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.

CXG 66, *Guidelines for the use of flavourings*

CXS 192, *General standard for food additives*

EAS 38, *Labelling of prepackaged foods — General requirements*

EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

EAS 769, *Fortified edible fats and oils — Specification*

EAS 803, *Nutrition labelling — Requirements*

EAS 804, *Claims — General requirements*

EAS 805, *Use of nutrition and health claims — Requirements*

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

ISO 3960, *Animal and vegetable fats and oils — Determination of peroxide value*

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 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 13547 -2, *Copper, lead, zinc and nickel sulfide concentrates — Determination of arsenic Part 2: Acid digestion and by inductively coupled plasma atomic emission and spectrometric method*

ISO 16050, *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*

ISO 21033, *Animal and vegetable fats and oils — Determination of trace elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)*

### 3 Terms and definitions

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

#### 3.1 virgin macadamia oil

edible macadamia oil obtained without altering its nature that may be obtained by use of mechanical procedures such as expelling or pressing, with or without the application of heat and without the use of solvents. It may have been purified by washing with water, settling, filtering and/or centrifuging only

#### 3.2 cold-pressed macadamia oil

virgin macadamia oil obtained without the application of heat.

#### 3.3 refined (non-virgin) macadamia oil

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

#### 3.4 foreign matter

any undesirable material visible with naked eye in a packaged edible macadamia oil

#### 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 macadamia oil shall:

- a) be obtained from raw macadamia kernels which are clean and free from mould infestation
- b) be free from foreign matter
- c) be free from rancid or undesirable odour and/or taste; and
- d) have colour characteristic of macadamia oil.

## 4.2 Specific requirements

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

**Table 1 — Specific compositional and quality requirements for edible macadamia oil**

S/N	Characteristic	Requirement	Test method
i.	Moisture and volatile matter at 105 °C, %, m/m, max.	0.2	ISO 662
ii.	Insoluble impurities, %, m/m, max.	0.05	ISO 663
iii.	Soap Content, %, m/m, max.	0.005	ISO 10539
iv.	Acid value, (mg/KOH/g (max.)) <ul style="list-style-type: none"><li>• Virgin</li><li>• Refined (non-virgin)</li></ul>	4.0	ISO 660
		0.6	
v.	Peroxide value, (mEq oxygen/kg (max.)) <ul style="list-style-type: none"><li>• Virgin</li><li>• Refined (non-virgin)</li></ul>	15	ISO 3960
		10	
vi.	Iron (Fe) mg/kg, max. <ul style="list-style-type: none"><li>• Virgin</li><li>• Refined (non-virgin)</li></ul>	5.0	ISO 21033
		1.5	
vii.	Copper, mg/kg, max. <ul style="list-style-type: none"><li>• Virgin</li><li>• Refined (non-virgin)</li></ul>	0.4	ISO 21033
		0.1	
viii.	Iodine Value $gl_2$ , per 100 g	65 - 85	ISO 3961
ix.	Saponification value, mg KOH/g oil	190 - 200	ISO 3657
x.	Refractive index, at 20 °C	1.460 - 1.470	ISO 6320
xi.	Relative density at 20 °C	0.905 - 0.920	ISO 6883

## 5 Fortification

Edible refined macadamia oil may be fortified. Where fortification of edible macadamia oil is done, it shall be in accordance with EAS 769.

## 6 Food additives

6.1 Edible virgin macadamia oil shall not contain food additives.

6.2 Food additives when used in edible refined macadamia oil shall comply with CXS 192.

## 7 Flavouring agents

7.1 Edible virgin macadamia oil shall not contain flavouring agents.



7.2 Flavouring agents when used in edible refined macadamia oil shall comply with CXG 66.

## 8 Contaminants

### 8.1 Pesticide residues

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

### 8.2 Heavy metal contaminants

Edible macadamia oil shall comply with the maximum limits of heavy metals as specified in Table 2 when tested in accordance with the test methods therein.

**Table 2 — Limits for heavy metal contaminants in edible macadamia oil**

S/N	Contaminant	Maximum limit mg/kg	Test method
i.	Lead (Pb)	0.08	ISO 12193
ii.	Arsenic (As)	0.1	ISO 13547 -2

### 8.3 Aflatoxins

Aflatoxin levels in edible macadamia oil shall not exceed the limits given in Table 3 when tested in accordance with the test method specified therein.

**Table 3 — Aflatoxin limits for edible macadamia oil**

S/No.	Characteristic	Maximum limit µg/kg	Test method
i.	Total aflatoxin	10	ISO 16050
ii.	Aflatoxin B1	5	

## 9 Hygiene

Edible macadamia oil shall be produced, processed, handled and stored in accordance with EAS 39.

## 10 Packaging

Edible macadamia oil shall be packaged in food grade packaging material and sealed in a manner that will safeguard the hygienic, nutritional, and organoleptic properties of the product.

## **11 Labelling**

In addition to the labelling requirements specified in EAS 38, the following information shall be legibly and indelibly labelled:

- a) name of the product as Macadamia oil;
- b) type of the oil as:
  - i) virgin;
  - ii) cold-pressed
  - iii) refined (non-virgin)

## **12 Nutrition and health claims**

Edible macadamia oil may have claims on nutrition and health. Such claims when declared shall comply with EAS 803, EAS 804 and EAS 805.

## **13 Sampling**

Sampling and sample preparation for test shall be done in accordance with ISO 5555 and ISO 661 respectively.

(1)

**Annex A**  
(informative)

**Gas Liquid Chromatography (GLC) fatty acid composition**

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

**Table A.1 — GLC fatty acid composition for edible macadamia oil**

Carbon configuration	Composition %
C12:0	< 0.2
C14:0	< 1.5
C16:0	7.0 – 12.0
C16:1	14.0-25.0
C17:0	< 0.2
C17:1	< 0.1
C18:0	2.0 – 6.0
C18:1	50.0 – 70.0
C18:2	1.0 – 5.0
C18:3	< 1.2
C20:0	1.5 – 3.0
C20:1	1.5 - 3.0
C22:0	< 1.7
C22:1	< 1.0
C24:0	< 0.5

## Bibliography

[1]

[2]

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