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ICS 67.200

EAST AFRICAN STANDARD

Edible Maize/ Corn oil — Specification

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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.

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. 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 procedures of the Community.

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

This second edition cancels and replaces the first edition (EAS 304:2000), which has been technically revised

Edible Maize/ corn oil — Specification

1. Scope

This East African Standard specifies the requirements, sampling and test methods for edible maize/corn oil derived from the germ of maize/corn (*Zea mays* L.) 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 pre-packaged 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 on foods — 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 3596, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Method using diethyl ether extraction*

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*

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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 inductively coupled plasma atomic emission spectrometric method*

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

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 standard, the following terms and definitions shall apply

3.1
edible maize/ corn oil
edible oil derived from maize germ (the embryos of Zea mays L.)

3.2
virgin maize/corn oil
edible maize/ corn 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

3.3
cold-pressed maize/corn oil
virgin maize/corn oil obtained by mechanical procedures without the application of heat

3.4
refined (non-virgin) maize/ corn oil
edible maize/corn oil obtained by mechanical procedures and/or solvent extraction and subjected to refining processes

3.5
foreign matter
any undesirable material visible with naked eye in a packaged edible maize/corn oil

3.6
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 maize/corn oil shall:

a) be obtained from germ (embryo) of themaize/ corn kernels which are mature, clean and practically free from insect infestation;
b) be free from foreign matter;
c) be free from rancid or undesirable odour and/or taste;
d) be free from admixture with other oils; and
e) have colour characteristic of maize/ corn oil.

4.2 Specific requirements

Edible maize/corn oil shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein

Table 1- Specific requirements for edible corn oil

S/N	Parameter	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. • Virgin • Non-virgin (refined)	 4.0 0.6	ISO 660
v.	Peroxide value, mEq oxygen/kg max. • Virgin • Non-virgin (refined)	 15 10	ISO 3960
vi.	Iron (Fe), mg/kg, max. • Virgin • Non-virgin (refined)	 5.0 1.5	ISO 21033
vii.	Copper (Cu), mg/kg, max. • Virgin • Non-virgin (refined)	 0.4 0.1	
viii.	Iodine value, g I_2 per 100 g	103 – 135	ISO 3961
ix.	Saponification value, mg KOH/g oil	187 – 195	ISO 3657
x.	Unsaponifiable matter, g/kg, max.	28	ISO 3596
xi.	Refractive index, at 40 ºC	1.465 – 1.468	ISO 6320
xii.	Relative density at 20 ºC	0.917 – 0.925	ISO 6883
xiii.	Colour units in a 25.4 mm Lovibond cell, max.	Red: 7 Yellow: 70	ISO 15305
	[Fatty acid composition]	[Annex A]	ISO 5508

5.

5. Fortification

Edible maize/corn oil may be fortified. When fortified, the product shall comply with EAS 769.

6. Food additives

6.1 Food additives when used in edible non-virgin (refined) maize/corn oil shall comply with CXS 192.

6.2 Edible virgin or cold pressed maize/corn oil shall not contain food additives.

7. Flavourings

7.2 Flavourings when used in maize/ corn oil shall comply with CXG 66-2008.

8. Contaminants

8.1 Pesticide residues

Edible maize/corn oil shall comply with the maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

8.2 Heavy metals

Edible maize/ corn oil shall comply with the maximum limits for heavy metals given in Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Limits for heavy metals in edible maize/ corn oil

S. No.	Contaminant	Limit (mg/kg, max.)	Test method
iv)	Lead, mg/kg	0.08	ISO 12193
v)	Arsenic, mg/kg	0.1	ISO 13547-2

8.3 Aflatoxins

Aflatoxin levels in edible maize/corn 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 maize/corn oil

S/N	Parameter	Limit µg/kg, max.	Test method

i.	Total aflatoxin	10	ISO 16050
ii.	Aflatoxin B1	5	

8.4 Other Contaminants and Toxins

The edible maize/ corn oil shall comply with the maximum levels specified in CXS 193-1995.

9 Hygiene

Edible maize/corn oil shall be produced, processed, handled and stored in accordance with EAS 39

10. Packaging

Edible maize/corn oil shall be packaged in food grade packaging material and sealed in a manner that safeguards the hygienic, nutritional and organoleptic properties of the product.

11. Labelling

11.1 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 “maize oil” or “corn oil”)], [name of the product as “Edible maize oil” or “Edible corn oil”)].]

b) type of the oil as:

i) virgin;

ii) cold-pressed; or

iii) non-virgin or refined.

11.2 Maize/ Corn Oil shall comply with the requirements for labelling non-retail containers as provided in EAS 1246.

12. Nutrition and health claims

Edible maize/corn oil may have claims on nutrition and health. Such claims when made shall comply with EAS 803, EAS 804 and EAS 805

13. Sampling

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

Annex A
(informative)

Gas Liquid Chromatography (GLC) fatty acid composition

Table A.1 provides the fatty acid profile range for edible maize/corn oil, when tested using Gas Liquid Chromatography (GLC).

Table A.1 — Fatty acid composition for edible maize/corn oil

Carbon configuration	Composition %
C6:0	ND
C8:0	ND
C10:0	ND
C12:0	<0.3
C14:0	<0.3
C16:0	8.6-16.5
C16:1	<0.5
C17:0	<0.1
C17:1	<0.1
C18:0	<3.3
C18:1	20.0-42.2
C18:2	34-65.6
C18:3	<2.0
C20:0	0.3−1.0
C20:1	0.2−0.6
C20:2	<0.1
C22:0	<0.5
C22:1	<0.3
C22:2	ND
C24:0	<0.5
C24:1	ND
ND – non detectable, defined as ≤0.05%	

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