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## DRAFT EAST AFRICAN STANDARD

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### Milled maize (corn) products – 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 44 was prepared by Technical Committee EASC/ TC 014, *Cereals, pulses and related products*.

This Fourth edition cancels and replaces the third edition (EAS 44: 2017), which has been technically revised.

## Milled maize (corn) products – Specification

### 1 Scope

This East African Standard specifies requirements, sampling and test methods for whole maize meal, granulated maize meal, sifted maize meal, maize grits and maize flour from the grains of common maize (*Zea mays* L.) intended for human consumption. Maize grits intended for brewing, manufacturing of starch, any other industrial use are not covered.

This standard does not apply to fortified milled maize (corn) products.

### 2 Normative references

The following referenced documents are indispensable for the application 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 901, *Cereal and Pulses - Test methods*

EAS 900, *Cereal and Pulses - Sampling*

AOAC 952.13, *Arsenic in food – Silver diethyldithiocarbamate*

CODEX STAN 192, *Codex general standard for food additives*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

EAS 2, *Maize grains – Specification*

EAS 38, *Labelling of pre-packaged foods – Specification*

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

ISO 7305 *Milled cereal products -- Determination of fat acidity*

AOAC 965.22 *Sorting Corn Grits Sieving Method Modified*

ISO 2171, *Cereals, pulses and by-products – Determination of ash yield by incineration*

ISO 4833-1 *Microbiology of the food chain -- Horizontal method for the enumeration of microorganisms -- Part 1: Colony count at 30 degrees C by the pour plate technique*

ISO 5985, *Animal feeding stuffs -- Determination of ash insoluble in hydrochloric acid*

ISO 21527-2 *Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of yeasts and moulds -- Part 2: Colony count technique in products with water activity less than or equal to 0,95*

ISO 16649-2 *Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli -- Part 2: Colony-count technique at 44 degrees C using 5-bromo-4-chloro-3-indolyl beta-D-glucuronide*

ISO 6579-1 *Microbiology of the food chain -- Horizontal method for the detection, enumeration and serotyping of Salmonella -- Part 1: Detection of Salmonella spp*

ISO 6561-1, *Fruits, vegetables and derived products – Determination of cadmium content – Part 1: Method using graphite furnace atomic absorption spectrometry*

ISO 6561-2, *Fruits, vegetables and derived products – Determination of cadmium content – Part 2: Method using flame atomic absorption spectrometry.*

ISO 6633, *Fruits, vegetables and derived products – Determination of lead content – Flameless atomic absorption spectrometric method*

ISO 6888-1, *Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) – Part 1: Technique using Baird-Parker agar medium*

ISO 11085, *Cereals, cereals-based products and animal feeding stuffs – Determination of crude fat and total fat content by the Randall extraction method*

ISO 5498, *Agricultural food products – Determination of crude fibre content – General method*

### 3 Terms and definitions

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

#### 3.1

##### **milled maize (corn) products**

products obtained from maize grains *Zea mays* L. through milling process

#### 3.2

##### **whole maize meal**

food prepared from fully mature, sound, un-germinated, whole kernels of maize, *Zea mays* L., by a grinding process in which the entire grain is comminuted to a suitable degree of fineness

#### 3.3

##### **granulated maize meal**

coarse product obtained from milling and sifting of clean shelled maize

#### 3.4

##### **sifted maize meal**

form of granulated maize meal that has been reduced to a certain degree of fineness

#### 3.5

##### **sifting**

particle size separation by sieving and aspiration of milled products

#### 3.6

##### **clean maize kernel**

shelled maize that has been subjected to a cleaning process for the removal of foreign and objectionable matter originally present

#### 3.7

##### **maize flour**

product obtained by removing the germ and bran followed by grinding, clean maize kernels using roller mills or other methods and sifting the resulting product to suitable degree of fineness

#### 3.8

##### **food grade packaging material**

material which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product

## 3.9

**foreign matter**

Organic or inorganic material other than maize flour.

**4 Quality requirements****4.1 General requirements**

**4.1.1** Milled maize (corn) products shall be made from maize grain complying with EAS 2.

**4.1.2** Milled maize (corn) products shall:

- a) be characteristic of the colour of maize from which they were prepared;
- b) not contain any foreign matter such as insects, fungi or dirt;
- c) be free from fermented musty or other objectionable odour and colours; and
- d) be wholesome and fit for human consumption in all aspects.

**4.2 Specific requirements**

Milled maize (corn) products shall comply with the requirements given in Table 1 when tested in accordance with the test methods specified therein.

**Table 1 – Specific requirements for milled maize (corn) products**

S/N	Characteristic	Type					Test method
		Sifted maize meal	Granulated maize meal	Whole maize meal	Maize flour	Maize grit	
i.	Crude fibre, % by m/m, max.	0.7	1.0	3.0	0.7	1.0	ISO 5498
ii.	Crude fat on moisture free basis, % by m/m, max.	3.0	3.0	3.1*	3.0	3.0	ISO 11085
iii.	Moisture content, % by m/m, max.	14	14	14	14	14	EAS 901 Clause 5
iv.	Total ash, % by m/m, max.	1.0	1.0	3.0	1.0	1.0	ISO 2171
v.	Acid insoluble ash, % by m/m, max.	0.15	0.35	0.40	0.15	0.15	ISO 5985
vi.	Fat acidity, mg KOH per 100 g of product, on dry mass basis, max.	80	80	80	80	80	ISO 7305
vii.	Residue on sieving through 1000-micron sieve, % by m/m, max	0.5	N/A	N/A	0.5	N/A	AOAC 965.22
* Minimum crude fat on moisture free basis for whole maize meal N/A not applicable							

## 5 Food additives

Milled maize (corn) products may contain only the permitted food additives specified in CODEX STAN 192.

## 6 Hygiene

6.1 Milled maize (corn) products shall be prepared and handled in accordance with EAS 39.

6.2 The product shall conform to the microbiological limits in Table 2 when tested in accordance with test methods specified therein.

**Table 2 – Microbiological limits for milled maize (corn) products**

S/N	Micro-organism	Maximum limit	Test method
i.	Total aerobic count, cfu/g	10 <sup>5</sup>	ISO 4833-1
ii.	<i>Escherichia coli</i> , cfu/g	<1x 10 <sup>2</sup>	ISO 16649-2
iii.	<i>Salmonella</i> , per 25 g	Absent	ISO 6579-1
iv.	Yeast and moulds, cfu/g	10 <sup>4</sup>	ISO 21527-2
v.	<i>Staphylococcus aureus</i> , cfu/g	<10	ISO 6888-1

## 7 Contaminants

### 7.1 Heavy metals

Milled maize (corn) products shall comply with the heavy metal limits in Table 3 when tested in accordance with test methods specified therein.

**Table 3 – Heavy metals limits for milled maize (corn) products**

S/N	Heavy metal	Limit mg/kg	Test method
i.	Arsenic (As)	0.1	AOAC 952.13
ii.	Lead (Pb)	0.2	ISO 6633
iii.	Cadmium (Cd)	0.1	ISO 6561-1 ISO 6561-2

### 7.2 Pesticide residues

Milled maize (corn) products shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

### 7.3 Mycotoxins

Milled maize (corn) products shall comply with mycotoxin limits specified in Table 4 when tested in accordance with test methods specified therein.

**Table 4 – Mycotoxins limits for milled maize (corn) products**

S/ N	Mycotoxin	Maximum limit	Test method
i.	Total aflatoxins, µg/kg	10	EAS 901, Clause 9 Clause 10
ii.	Aflatoxins B <sub>1</sub> , µg/kg	5	
iii.	Fumonisin, µg/kg	2 000	Clause 11 Clause 12

### 8 Weights and measures

Milled maize (corn) products shall be packaged in accordance with the weights and measures regulations of the destination country.

NOTE EAC Partner States are signatory to the International Labour Organizations (ILO) for maximum package weight of 50 kg where human loading and offloading is involved.

### 9 Packaging

Milled maize (corn) products shall be packaged in food grade packaging materials. When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

### 10 Labelling

Labelling shall be done in accordance with EAS 38. At the minimum, the following information shall be displayed:

- a) Name of product as "Whole Maize Meal, Sifted Maize meal, Maize Flour or Granulated Maize Meal";
- b) name and address of the manufacturer/packer/importer;
- c) brand name/registered trade mark;
- d) batch or code number;
- e) net weight in metric units;
- f) storage instruction as "Store in a cool dry place away from any contaminants";
- g) the statement "Food for human consumption";
- h) country of origin;
- i) date of manufacture;



- j) expiry date; and
- k) Instructions for disposal of used package.

## **11 Sampling**

Sampling shall be done in accordance with EAS 900.

## Bibliography

CODEX STAN 154:1985(Rev.1:1995), *Standard for whole maize (corn) meal*

