EAST AFRICAN COMMUNITY

EDICT OF GOVERNMENT

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EAS 2 (2011) (English): Maize grains – Specification

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EAST AFRICAN STANDARD

Maize grains — 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 East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. 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.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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.

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Introduction

This standard has been developed to take into account:

— the needs of the market for the product;

— the need to facilitate fair domestic, regional and international trade and prevent technical barriers to trade by establishing a common trading language for buyers and sellers.

— the structure of the CODEX, UNECE, USA, ISO and other internationally significant standards;

— the needs of the producers in gaining knowledge of market standards, conformity assessment, commercial cultivars and crop production process;

— the need to transport the product in a manner that ensures keeping of quality until it reaches the consumer;

— the need for the plant protection authority to certify, through a simplified form, that the product is fit for cross-border and international trade without carrying plant disease vectors;

— the need to promote good agricultural practices that will enhance wider market access, involvement of small-scale traders and hence making farming a viable means of wealth creation; and

— the need to ensure a reliable production base of consistent and safe crops that meet customer requirements.

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Maize grains — Specification

1 Scope

This East African Standard specifies requirements and methods of sampling and test for maize grains. The standard applies to maize (corn) for direct human consumption, i.e., ready for its intended use as human food, presented in packaged form or sold loose from the package directly to the consumer. This standard specifies requirements for whole grain shelled dent maize, *Zea mays indentata* L., and/or shelled flint maize, *Zea mays indurata* L., or their hybrids and of all colour types.

2 Normative references

The following normative documents contain provisions which, through reference in this text constitute provisions of this East African

ISO 605*, Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 711, *Cereals and cereal products — Determination of moisture content (Basic reference method)*

ISO 712*, Cereals and cereal products — Determination of moisture content — Routine reference method*

ISO 5223, *Test sieves for cereals*

ISO 6639-1, *Cereals and pulses — Determination of hidden insect infestation — Part 1: General principles*

ISO 6639-2, *Cereals and pulses — Determination of hidden insect infestation — Part 2: Sampling*

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*

ISO 13690, *Cereals, pulses and milled products — Sampling of static batches*

ISO 16050, *Foodstuffs — Determination of aflatoxin B_1, and the total content of aflatoxin B_1, B_2, G_1 and G_2 in cereals, nuts and derived products — High performance liquid chromatographic method*

EAS 39, Code of Hygiene Practice in Food and Drink Manufacturing Industry

CODEX Stan 193, Codex general Standards for contaminants and toxins in Food and Feed

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

EAS 79, *Cereals and pulses as grain — Methods of sampling*

EAS 217, *Methods for the microbiological examination of foods*

EAS 285, Maize-Determination of moisture content

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3 Terms and Definitions

For the purpose of this East African Standard, the following definitions shall apply:

3.1
maize (corn)
the shelled grains of the species *Zea mays indentata* L, (dent maize) and/or *Zea* mays *indurata* L, (flint maize), or their hybrids

3.2
blemished/damaged grains
grains which are insect or vermin damaged, stained, diseased, discoloured, germinated, frost damaged, or otherwise materially damaged

3.3
insect or vermin damaged grains
kernels with obvious weevil-bored holes or which have evidence of boring or tunneling, indicating the presence of insects, insect webbing or insect refuse, or degermed grains, chewed in one or more than one part of the kernel which exhibit evident traces of an attack by vermin

3.4
stained kernels
kernels whose natural colour has been altered by external factors. This includes ground, soil or weather damaged kernels, which may have dark stains or discolourations with a rough external appearance
3.5
diseased grains
grains made unsafe for human consumption due to decay, moulding, or bacterial decomposition, or other causes that may be noticed without having to cut the grains to examine them

3.6
discoloured kernels
kernels materially discoloured by excessive heat, including that caused by excessive respiration (heat damage) and dried damaged kernels. Kernels may appear darkened, wrinkled, blistered, puffed or swollen, often with discoloured, damaged germs. The seed coat may be peeling or may have peeled off completely, giving kernels a checked appearance.

3.7
germinated kernels
kernels showing visible signs of sprouting, such as cracked seed coats through which a sprout has emerged or is just beginning to merge

3.8
frost damaged kernels
kernels which appear bleached or blistered and the seed coat may be peeling, germs may appear dead or discoloured

3.9
mouldy kernels
maize grains with visible mycelial growth on its tip or surface

3.10
immature/shriveled grains
maize grains which are underdeveloped, thin and papery in appearance

3.11
broken kernels
pieces of maize which shall pass through a 4.50 mm metal sieve

3.12
other grains

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other grains are edible grains, whole or identifiable broken, other than maize (i.e., cereals, pulses and other edible legumes)

3.13
foreign matter
all organic and inorganic material (such as sand, soil, glass) other than maize, broken kernels and other grains

3.14
filth
impurities of animal origin

3.15
defective grains
pest damaged, discouloured, diseased, germinated, mouldy, immature and shriveled grains, or otherwise materially damaged, which specifically do not include broken grains

4 Quality Requirements

4.1 General requirements

4.1.1 Maize may be presented as yellow, white, or red, or a mixture of these colours.

4.1.2 Yellow maize may contain not more than 5.0 % by weight of maize of other colours. Maize grains which are yellow and/or light red in colour are considered to be yellow maize. Yellow maize also means maize grains which are yellow and dark red in colour, provided the dark red colour covers less than 50 % of the surface of the grain.

4.1.3 White maize may contain not more than 2.0 % by weight of maize of other colours. Maize grains which are white and/or light pink in colour are considered to be white maize. White maize also means maize grains which are white and pink in colour, provided the pink colour covers less than 50 % of the surface of the grain.

4.1.4 Red maize may contain not more than 5.0 % by weight of maize of other colours. Maize grains which are pink and white, grey or dark red and yellow in colour are considered to be red maize, provided the pink or dark red or yellow colour covers 50 % or more of the surface of the grain.

4.1.5 Mixed maize includes maize not falling into the classes of white, yellow or red maize as defined in 4.1.2 to 4.1.4

4.1.6 Maize also may be presented as flint or dent or their hybrids or mixtures thereof.

4.1.7 Flint maize includes maize of any colour which consists of 95 % or more by weight of grains of flint maize.

4.1.8 Dent maize includes maize of any colour which consists of 95 % or more by weight of grains of dent maize.

4.1.9 Flint and dent maize includes maize of any colour which consists of more than 0.5 % but less than 95.0 % of flint maize.

4.1.10 Maize shall be free from foreign odours, moulds, live pests, rat droppings, toxic or noxious weed seeds and other injurious contaminants as determined from samples representative of the lot.

4.1.11 Maize shall be of a reasonably uniform colour according to type, be whole and clean.

4.2 Specific requirements

4.2.1 Grading

Maize grains shall be graded into three grades on the basis of the tolerable limits established in Table 1 which shall be additional to the general requirements set out in this standard.

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4.2.2 Ungraded maize grains

Shall be maize grains which do not fall within the requirements of Grades 1, 2 and 3 of this standard but are not rejected maize grains.

Note: For Tanzania and Burundi this requirement shall not apply.

4.2.3 Reject grade maize grains

This comprises maize grains which have objectionable odour, off flavour, living insects or which do not possess the quality characteristics specified in Table 1. They cannot satisfy the conditions of ungraded maize grains and shall be graded as reject maize grains and shall be regarded as unfit for human consumption.

Table1 — Specific requirements

Characteristics	Maximum limits			Method of test
	Grade 1	Grade 2	Grade 3	
Foreign matter, % m/m	0.5	1.0	1.5	ISO 605
Inorganic matter, % m/m	0.25	0.5	0.75	
Broken kernels, % m/m	2.0	4.0	6.0	
Pest damaged grains, % m/m	1.0	3.0	5.0	
Rotten & Diseased grains, % m/m	2.0	4.0	5.0	
Discoloured grains, % m/m	0.5	1.0	1.5	
Moisture, % m/m	13.0	13.0	13.0	EAS 285/ISO 711/712
Immature/Shriveled grains, % m/m	1.0	2.0	3.0	ISO 605
Filth, % m/m	0.1	0.1	0.1	
Total Aflatoxins, ppb	10			ISO 16050
Aflatoxin B1, ppb	5			
Fumonisin, ppm	2			
Total Defectives Grains, % m/m	4.0	5.0	7.0	ISO 605

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5 Contaminants

5.1 Toxic metals

Maize grains shall comply with those maximum limits for heavy metals established by the Codex Alimentarius Commission for this commodity.

5.2 Pesticide residues

Maize grains shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity

Note: where the use of certain pesticides is prohibited by some Partner States, then it shall be notified to all Partner States accordingly.

5.3 Mycotoxin limits

Maize grains shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity. In particular, total aflatoxin levels in maize grains for human consumption shall not exceed 10 µg/kg (ppb) with B_1 not exceeding 5 µg/kg (ppb) when tested according to ISO 16050.

6 Hygiene

6.1 Maize grains shall be produced, prepared and handled in accordance with the provisions of appropriate sections of EAS 39

6.2 When tested by appropriate standards of sampling and examination listed in Clause 2, the products:

— shall be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 2;

— shall be free from parasites which may represent a hazard to health; and

— shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

Table 2 — Microbiological

	Type of micro-organism	**Limits**	**Test method**
i)	Yeasts and moulds, max. per g	10^4	EAS 217
ii)	*S.aureus* per 25 g	Not detectable	
iii)	*E. Coli*, max. per g	Not detectable	
iv)	*Salmonella,* max. per 25 g	Not detectable	

7 Packaging

7.1 Maize grains shall be packed in suitable packages which shall be clean, sound, free from insect, fungal infestation and the packing material shall be of food grade quality

7.2 Maize grains shall be packed in containers which will safeguard the hygienic, nutritional, and organoleptic qualities of the products.

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7.3 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odour or flavor to the product.

7.4 Each package shall contain Maize grains of the same type and of the same grade designation.

7.5 If maize grains are presented in bags, the bags shall also be free of pests and contaminants.

7.6 Each package shall be securely closed and sealed.

8 Marking or labelling

8.1 In addition to the requirements in EAS 38, each package shall be legibly and indelibly marked with the following:

i) product name as “White Maize Grains, Yellow Maize Grains Red Maize Grains or Mixed Maize Grains”;

ii) grade;

iii) name, address and physical location of the producer/ packer/importer;

iv) lot/batch/code number;

v) net weight, in kg;

Note: EAC partner states are signatory to the International Labour Organizations (ILO) for maximum package weight of 50kg where human loading and offloading is involved

vi) the declaration “Food for Human Consumption’’

vii) storage instruction as “Store in a cool dry place away from any contaminants’’;

viii) crop year;

ix) packing date;

x) instructions on disposal of used package;

xi) country of origin;

xii) a declaration on whether the maize was genetically modified where applicable.

9 Methods of sampling

Sampling shall be done in accordance with the EAS 79/ISO 13690.

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