EAST AFRICAN STANDARD

Milled rice — 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.

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 128:2013 was prepared by Technical Committee EAS/TC 014, Cereals, Pulses and related products

This second edition cancels and replaces the first edition (EAS 128:2000) which has been technically revised.
Introduction

This standard has been developed to take into account:

a) the needs of the market for the product;

b) 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;

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

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

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

f) 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;

g) 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

h) the need to ensure a reliable production base of consistent and safe crops that meet customer requirements.
Milled rice — Specification

1 Scope

This East African Standard specifies the requirements and methods of sampling and test for milled rice of the varieties grown from *Oryza* spp. intended for human consumption.

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

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

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

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

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

ISO 16050, *Foodstuffs — Determination of aflatoxin B₁, and the total content of aflatoxin B₁, B₂, G₁ and G₂ in cereals, nuts and derived products — High performance liquid chromatographic method*

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

EAS 764, *Rough (paddy) rice — Specification*

EAS 765, *Brown rice — Specification*

3 Terms and definitions

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

3.1 milled rice

whole or broken kernels of rice (*Oryza* spp.) from which the hulls and at least the outer bran layers have been removed
3.2 bran
by product from milling consisting of the outer (pericarp) layers of the kernel with part of the germ

3.3 aromatic milled rice
special varieties of rice (Oryza sativa L. scented) that have a distinctive and characteristic aroma; for example, basmati and jasmine rice

3.4 broken kernels
pieces of rice that are less than three-quarters of a whole kernel and includes grains of rice in which part of the endosperm is exposed or rice without a germ. If the piece is more than three-quarters of a kernel, it is considered whole.

3.5 brown rice
whole or broken kernels of rice from which the hulls have been removed

3.6 chalky kernels
head rice or broken kernel of non-parboiled rice, except wax rice, whose whole surface has an opaque and floury appearance

3.7 chip
part of kernel which passes through a metal sieve with round perforations 1.4 mm in diameter

3.8 damaged /defective
kernels, pieces of rice kernels, and other grains that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, injured-by-heat, insect-bored, field fungi, skinned, mould-damaged, shot or sprout-damaged, dark tipped, pink-stained, over-dried damaged, bin burnt, storage mould affected or rotted, smut, stained or otherwise materially damaged.

3.9 foreign matter
organic and inorganic material other than rice, broken kernels, other grains and filth

3.10 glutinous milled rice
special varieties of rice (Oryza sativa L. glutinosa) which contain more than 50 % chalky kernels and have a white and opaque appearance

3.11 granulated brewers milled rice
milled rice which has been crushed or granulated so that 95.0 % or more will pass through a 5 sieve, 70.0 % or more will pass through a 4 sieve, and not more than 15.0 % will pass through a 2 1/2 sieve.

3.12 head rice
whole kernel or part of the kernel with a length greater than or equal to 75 % of the average length of the test sample kernels (see Figure 1)
Key

a  Not passing through a round perforation of 1.4 mm in diameter

$L$ is the average length

**Figure 1 — Size of kernels, broken kernels and chips**

3.13 **heat-damaged**
whole or broken kernels of rice which are materially discoloured and damaged as a result of heating and parboiled kernels in nonparboiled rice which are as dark as, or darker in color than, the interpretive line for heat-damaged kernels.

**NOTE** This category includes the kernel that is yellow/dark yellow in the case of non-parboiled rice and orange/dark orange in the case of parboiled rice, due to a microbiological alteration.

3.14 **immature /malformed**
head rice or broken kernel which is unripe and/or badly developed

3.15 **insect/pest damaged**
grains eaten in part by stored grain insects and any field pests of grains including *Heliothis spp.* Grains may have a hole (commonly referred to as bored) or have a chewed appearance on any part of the grain.

3.16 **large broken kernel**
part of kernel with a length less than three-quarters but greater than one half of the average length of the test sample kernels

3.17 **medium broken kernel**
part of kernel with a length less than or equal to one half but greater than one quarter of the average length of the test sample kernels (Figure 1)

3.18 **paddy kernels**
whole or broken unhulled kernels of rice; whole or broken kernels of brown rice, and whole or broken kernels of milled rice having a portion or portions of the hull remaining which cover 12.5 % or more of the whole or broken kernel
3.19 **parboiled milled rice**
rice in which the starch has been gelatinized by soaking, steaming, and drying.

3.20 **partly gelatinized kernel**
head rice or kernel of parboiled rice which is not fully gelatinized and shows a distinct white opaque area

3.21 **peck**
head rice or broken kernel of parboiled rice of which more than 25 % of the surface is dark brown or black in colour due to the parboiling process

3.22 **poisonous, toxic and/or harmful seeds**
seeds which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — datura (*D. fastuosa* Linn and *D. stramonium* Linn.) corn cokle (*Agrostemma githago* L., *Machai Lallium remulenum* Linn.) Akra (*Vicia species*), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

3.23 **red**
head rice or broken kernel having a red bran covering more than 25 % of its surface

3.24 **red-streaked kernel**
head rice or broken kernel with red bran streaks of length greater than or equal to 50 % of that whole kernel, but where the surface covered by these red streaks is less than 25 % of the total surface

3.25 **rotten**
kernels that are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They may feel spongy under pressure. There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotten kernels.

3.26 **un-gelatinized kernels**
whole or broken kernels of parboiled rice with distinct white or chalky areas due to incomplete gelatinization of the starch

3.27 **well milled kernels**
whole or broken kernels of rice from which the hulls and practically all of the germs and the bran layers have been removed

**NOTE** This factor is determined on an individual kernel basis and applies to the special grade Under-milled milled rice only.

3.28 **whole kernels**
unbroken kernels of rice and broken kernels of rice which are at least three-fourths of an unbroken kernel

3.29 **food grade material**
packaging material, made of substances which are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product
4 Quality requirements

4.1 General requirements

4.1.1 Milled rice shall be obtained from rough or brown rice complying to EAS 764 or EAS 765 respectively.

4.1.2 Milled rice shall be:

a) the dried mature grains of edible *Oryza* spp;

b) clean, wholesome, uniform in size, colour and shape;

c) safe and suitable for human consumption;

d) free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration; and

e) free from micro-organisms and substances originating from micro-organisms, fungi or other poisonous or deleterious substances in amounts that may constitute a hazard to human health.

4.1.3 Grades 1 to 4, inclusive, shall contain not more than 10.0 % of ungelatinized kernels. Grades 1 and 2 shall contain not more than 0.1 %, Grades 3 and 4 not more than 0.2 % of non parboiled rice.

4.1.4 If the rice is:

a) not distinctly coloured by the parboiling process, it shall be considered "parboiled light";

b) distinctly but not materially coloured by the parboiling process, it shall be considered "parboiled"; and

c) materially coloured by the parboiling process, it shall be considered "parboiled dark".

The colour levels for "parboiled light," "parboiled," and "parboiled dark", shall be in accordance with the interpretive line samples for parboiled rice.

NOTE The maximum limits for "Chalky kernels," "Heat-damaged kernels," and the "Colour requirements" are not applicable to the special grade "Parboiled milled rice."

4.2 Specific requirements

Milled rice grains for human consumption shall be graded into three grades on the basis of the tolerable limits established in Table 1.
Table 1 — Specific requirements

<table>
<thead>
<tr>
<th>S/N</th>
<th>Characteristics</th>
<th>Maximum limits</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Grade 1</td>
<td>Grade 2</td>
</tr>
<tr>
<td></td>
<td>Broken, %</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Heat damaged rice, %</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Damaged rice, %</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Chalky %</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Red or red streaked, %</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Immature grains, %</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Other contrasting varieties, %</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Organic matter, %</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Paddy grains, %</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moisture content, %</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fumonisins, ppm</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inorganic matter, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Filth, %</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moisture content, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total aflatoxin (AFB₁+AFB₂+AFG₁+AFG₂), ppb</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aflatoxin B₁, ppb</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fumonisins, ppm</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70 % of the sum total of individual defects.

4.3 Classification

If rice is classified as long grain, medium grain or short grain, the classification shall be in accordance with one of the following specifications:

a) Option 1 (Kernel length/width ratio):

i) Long grain rice:
   - Husked rice or parboiled husked rice with a length/width ratio of 3.1 or more; and
   - Milled rice or parboiled milled rice with a length/width ratio of 3.0 or more;

ii) Medium grain rice:
   - Husked rice or parboiled husked rice with a length/width ratio of 2.1–3.0; and
   - Milled rice or parboiled milled rice with a length/width ratio of 2.0–2.9;

iii) Short grain rice:
• Husked rice or parboiled rice with a length/width ratio of 2.0 or less; and
• Milled rice or parboiled milled rice with a length/width ratio of 1.9 or less;

b) Option 2 (Kernel length):
   i) Long grain rice has a kernel length of 6.6 mm or more;
   ii) Medium grain rice has a kernel length of 6.2 mm or more but less than 6.6 mm; and
   iii) Short grain rice has a kernel length of less than 6.2 mm;

c) Option 3 (Combination of the kernel length and the length/width ratio):
   i) Long grain rice has either:
      • kernel length of more than 6.0 mm and with a length/width ratio of more than 2 but less than 3, or;
      • kernel length of more than 6.0 mm and with a length/width ratio of 3 or more;
   ii) Medium grain rice has a kernel length of more than 5.2 mm but not more than 6.0 mm and a length/width ratio of less than 3; and
   iii) Short grain rice has a kernel length of 5.2 mm or less and a length/width ratio of less than 2.

NOTE: Traders should indicate which classification option is chosen.

5 Contaminants

5.1 Pesticide residues
Milled rice 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, it should be notified to all Partner States accordingly.

5.2 Other contaminants
Milled rice shall comply with those maximum limits for other contaminants established in CODEX STAN 193.

6 Hygiene

6.1 Milled rice 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:
   a) be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 2;
   b) be free from parasites which may represent a hazard to health; and
c) not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Type of micro-organism</th>
<th>Limits</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Yeasts and moulds, cfu per g, max.</td>
<td>$10^4$</td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td><em>Staphylococcus aureus</em>, cfu per g, max.</td>
<td>$10^3$</td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td><em>Escherichia coli</em>, per g</td>
<td>Absent</td>
<td>EAS 217</td>
</tr>
<tr>
<td>iv)</td>
<td><em>Salmonella</em>, per 25 g</td>
<td>Absent</td>
<td></td>
</tr>
</tbody>
</table>

7 Packaging

7.1 Milled rice shall be packed in suitable packages which shall be clean, sound, free from insect, fungal infestation and the packaging material shall be food grade.

7.2 Milled rice shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

7.3 Each package shall contain rice of the same type and of the same grade designation.

7.4 If milled rice is presented in bags, the bags shall also be free of pests and contaminants.

7.5 Each package shall be securely closed and sealed.

8 Labelling

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

a) product name as “Milled rice”;

b) variety;
   i) Long grain milled rice
   ii) Medium grain milled rice
   iii) Short grain milled rice
   iv) Mixed milled rice

c) grade;

d) name, address and physical location of the manufacturer/packer/importer;

e) lot/batch/code number;

f) net weight, in kilograms;

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.

g) the declaration “Food for human consumption”;

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

i) crop year;

j) packing date;

k) instructions on disposal of used package;

l) country of origin; and

m) a declaration on whether the milled rice was genetically modified or not.

9 Sampling methods

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