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EAST AFRICAN STANDARD

Raw cane sugar — 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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Raw cane sugar — Specification

1 Scope
This standard specifies requirements, methods of test and sampling for raw sugar produced from sugarcane and intended for further processing to make it fit 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 217-2, Methods for the microbiological examination of foods — Part 2: General guidance for the enumeration of micro-organisms-colony count technique at 30 °C
EAS 217-6, Methods for microbiological examination of foods — Part 6: Examination for Salmonella spp
EAS 217-8, Methods for the microbiological examination of foods — Part 8: Enumeration of yeast and moulds in foods
ICUMSA Method GS 1/2/3/9-1, The Determination of Polarisation of Raw Sugar by Polarimetry
ICUMSA Method GS 1/3/4/7/8-13, The Determination of Conductivity Ash in Raw Sugar
ICUMSA Method GS 1/3-7, The Determination of Raw Sugar Solution Colour at pH 7.0
ICUMSA Method GS 1/3/7-3, The Determination of Reducing Sugars in Cane Raw Sugar, Lane+Eynon Procedure
ICUMSA Method GS 1-5, The Determination of Reducing Sugars in Cane Raw Sugar, Luff-Schoorl Procedure
ICUMSA Method GS 1-10, The Determination of Ash in Raw Sugar by Single Sulphation
ICUMSA Method GS 1-16, The Determination of Starch in Raw Sugar by the BSES method
ICUMSA method GS 1-17, The Determination of Starch in Raw Sugar by the SPRI Rapid Starch Test
ICUMSA Method GS 2/1/3/9-15, The Determination of Sugar Moisture by Loss on Drying
ICUMSA Method GS 2/1/3-27, The Determination of Lead in Sugar Products by a Colorimetric Method
ICUMSA Method GS 2/3-23, The Determination of Arsenic and Lead in White Sugar, Atomic Adsorption Spectroscopy
ICUMSA Method GS 9/1/2/3-8, The Determination of Raw Sugar Solution Colour at pH 7.0, MOPS Method

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3 Terms and definitions

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

3.1 raw cane sugar
centrifugal sugar whose crystals are surrounded by film of molasses and is derived from sugar cane

3.2 ICUMSA unit
international unit developed by International Commission for Universal Methods of Sugar Analysis (ICUMSA) for expressing the purity of sugar and is directly related to the colour of sugar

3.3 polarisation
estimate of the sucrose content of sugar expressed as degrees of polarization

3.4 lot
collection of packages of the same size, type and style which have been manufactured and packaged under essentially the same conditions

4 Requirements

4.1 General requirements
Raw cane sugar shall be
a) in the form of uniform crystals;
   b) free from dirt, foreign and extraneous matter; and
   c) free from fermented, musty or undesirable odours.

4.2 Compositional requirements
Raw cane sugar shall conform to the compositional factors in Table 1
Table 1 — Composition and quality factors for raw cane sugar

<table>
<thead>
<tr>
<th>S No</th>
<th>Characteristic</th>
<th>Requirement/limits</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Polarisation, $^\circ Z$</td>
<td>94 - 99.0</td>
<td>ICUMSA Method GS 1/2/3/9-1</td>
</tr>
<tr>
<td>ii.</td>
<td>Invert sugar content % m/m (max)</td>
<td>1.2</td>
<td>ICUMSA Method GS 1-5 ICUMSA Method GS 1/3/7-3</td>
</tr>
<tr>
<td>iii.</td>
<td>Conductivity ash, % m/m (max)</td>
<td>1.0</td>
<td>ICUMSA Method GS 1-10 ICUMSA Method GS 1/3/4/7/8-13</td>
</tr>
<tr>
<td>iv.</td>
<td>Moisture content, % (max) (3 h at 105 °C ± 2 °C)</td>
<td>1.0</td>
<td>ICUMSA Method GS 2/1/3/9-15</td>
</tr>
<tr>
<td>v.</td>
<td>Colour, in ICUMSA units at 420 nm</td>
<td>&gt;1 300 - 6 000</td>
<td>ICUMSA Method GS 1/3-7 ICUMSA Method GS 9/1/2/3-8</td>
</tr>
<tr>
<td>vi</td>
<td>Starch, mg/kg m/m (max)</td>
<td>450</td>
<td>ICUMSA Method GS 1-16 ICUMSA method GS 1-17</td>
</tr>
</tbody>
</table>

5 Contaminants

5.1 Heavy metals

Raw cane sugar shall be free from heavy metals in amounts which may represent a hazard to human health and shall conform to the limits indicated in Table 2:

Table 2 — Maximum permissible levels of heavy metal contaminants

<table>
<thead>
<tr>
<th>S No</th>
<th>Heavy metal,</th>
<th>Maximum limit, mg/kg</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Arsenic (As)</td>
<td>1</td>
<td>ICUMSA Method GS 2/3-23</td>
</tr>
<tr>
<td>ii.</td>
<td>Lead (Pb)</td>
<td>2</td>
<td>ICUMSA Method GS 2/1/3-27</td>
</tr>
</tbody>
</table>

5.2 Pesticide residues

Raw cane sugar shall conform to those maximum residue limits established by the Codex Alimentarius Commission.

6 Hygiene

6.1 General requirements

Raw cane sugar shall be prepared and handled in accordance with the requirements of EAS 39.

6.2 Specific requirements

The product shall conform to the microbiological limits in Table 3.
Table 3 — Microbiological limits for raw cane sugar

<table>
<thead>
<tr>
<th>Microbiological parameter</th>
<th>Limit</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Plate Count (mesophylic), CFU/10 g, max</td>
<td>10^4</td>
<td>EAS 217-2:</td>
</tr>
<tr>
<td>Yeast and moulds, CFU/10 g, max</td>
<td>50</td>
<td>EAS 217-8</td>
</tr>
<tr>
<td>Escherichia coli, CFU/g</td>
<td>&lt;1</td>
<td>ISO 7251</td>
</tr>
<tr>
<td>Salmonella, per 25 g</td>
<td>Absent</td>
<td>EAS 217-6</td>
</tr>
</tbody>
</table>

7 Packaging

Raw cane sugar shall be packaged in food grade materials that ensure product safety and integrity.

NOTE Packaging materials may be required to meet different regulations in the different destination countries.

The package fill shall conform to the requirements of the legal metrology of the Partner States.

8 Labelling

In addition to the requirements of EAS 38, the following specific provisions shall apply:

a) the name of the product shall be declared as “Raw cane sugar”;

b) the net contents shall be declared by weight in the metric units ("Systeme International");

c) the name, address and physical location of the manufacturer and/or the packer, distributor, importer, exporter or vendor of the product shall be declared;

d) the country of origin of the product shall be declared; and

e) the declaration, “Not for direct human consumption”.

9 Method of sampling

9.1 General requirements for sampling

In drawing, preparing, storing and handling of samples, the following precautions and directions shall be observed.

a) Samples shall be taken in a protected place not exposed to damp air, dust or soot.

b) The sampling instruments shall be clean and dry when used.

c) When sampling for microbiological purposes, the sampling instruments and containers for samples shall be sterilized preferably by dry heat at 170 °C for 1 h before use.

d) Precautions shall be taken to protect the samples, the material being sampled, the sampling instruments and the containers for samples from adventitious contamination.

e) The samples shall be placed in clean, dry, and moisture-proof containers.

f) The sample containers shall be sealed air-tight after filling and marked with name of material, date of sampling, name of the manufacturer, name of the person sampling and such other particulars of the consignments.
9.2 Scale of sampling

9.2.1 All the packages of the same size, type and style which have been manufactured and packaged under essentially the same conditions in a single consignment shall constitute a lot. Samples shall be tested separately for each lot for ascertaining the conformity of the sugar.

9.2.2 The number of bags to be selected \( n \) from the lot shall depend on the size \( N \) of the lot and shall be in accordance with the formula:

\[
n = \sqrt{N}
\]

These bags shall be selected at random from the lot; to ensure the randomness of selection a random number table, as agreed to between the purchaser and the supplier shall be used. In case such a table is not available, the following procedure shall be used:

Starting from any bag, count them as 1, 2, 3, … up to \( r \) and so on in one order, where \( r \) is equal to the integral part of \( N/n \), \( N \) being the total number of bags in the lot and \( n \) the number of bags to be selected. Every \( r^{th} \) bag thus counted shall be separated until the requisite number of bags is obtained from the lot to give samples for test.

In case of bags stacked in a pyramidal shape, approximately equal number of bags shall be selected from all exposed sides of the lot, so as to give the required number of sample bags.

9.3 Preparation of sample

9.3.1 Procedure

From the top, middle and bottom portions of each of the selected bags (see 9.2), approximately equal quantity of sugar shall be taken with the help of a suitable sampling instrument. The sample collected from each of the bags shall be thoroughly mixed so as to give a composite sample of 600 g. The composite sample thus prepared shall be divided approximately into three equal parts; one for the purchaser, one for the supplier, and the third for the referee and sealed air tight with particulars as given in 9.1.(f).

9.3.2 Number of tests

The composite sample prepared as under 9.3.1 shall be tested for the characteristics as prescribed in Table 1.

9.3.3 Criteria for conformity

The lot shall be declared as conforming to this specification, when the test results on various characteristics obtained on the composite sample satisfy the corresponding requirements.

10 Method of analysis — Determination of pesticides

Pesticide residues shall be determined according to AOAC methods of analysis for pesticides. (970.52, 985.22, and 970.53 of 1990).