DRAFT EAST AFRICA STANDARD

Fortified sugar — Specification

EAST AFRICAN COMMUNITY
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Foreword

Development of the East African Standard 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 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 Testing 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

The Health Ministers of the East, Central and Southern Africa (ECSA) Health Community passed a resolution in 2002 directing the Secretariat to work with the countries to fortify commonly consumed foods in the region after recognizing that the high levels of malnutrition in the region. ECSA-HC is an intergovernmental organization that fosters cooperation in health among countries in the East, Central and Southern African Region. It has 10 active member states namely Kenya, Uganda, Tanzania, Malawi, Zambia, Zimbabwe, Lesotho, Swaziland, Mauritius and Seychelles. The mandate of the organization is to promote relevance and efficiency in health in the region.

Following initial promotion efforts, the countries identified staple foods suitable for fortification as oil, sugar, maize/meal flour and wheat flour. These foods can be used as vehicles to deliver essential micronutrients to the populations. Based on scientific evidence and working with countries using country data, the Secretariat developed implementation focused guidelines on fortification of these foods to help countries start up programs and scale up the existing programs. These guidelines included fortification levels for addition of micronutrients at the factory, and levels for monitoring at commercial level.

Based on the guidelines and other available information, most of the countries in the East African Region and in the larger Africa have initiated national programs on oil fortification with vitamin A; and wheat and maize/meal flour fortification with iron, zinc, folic acid, niacin, vitamin B-1, B-2 and B-12, B6 and vitamin A. Sugar fortification with vitamin A has also been considered as a way of supplementing other sources of the vitamin in order to prevent and reduce problems associated with the deficiency of this vitamin. Salt fortification with iodine continues to be implemented in all the countries.

With the increased trade of food commodities including these fortified foods within the region, it has become imperative to develop regional standards that over and above the other standards, stipulate minimum and maximum levels of the added nutrients, provide clauses on how to pack the fortified product and the use of health and nutrition claims. The guidelines developed through ECSA have now been incorporated into food standards to provide for specific fortified products.

It is envisaged that, the adoption of these standards and their utilization within the region will help countries adopt food fortification as a strategy to prevent, alleviate or eliminate micronutrient deficiency in the region. Standards will not only promote the health of the population but will also ensure safety of food products and enhance fair trade.

This standard was developed with support from the East, Central and Southern African Health community (ECSA-HC) Secretariat. This was possible through a grant by the A2Z Project of the United States Agency for International Development (USAID). The financial and technical support was used in the process of formulation of fortification levels, development of the draft standards and mobilization of stakeholders to review the standard in national and regional fora. This support is hereby acknowledged.
Fortified sugar — Specification

1 Scope

This draft East African Standard specifies the requirements and methods of sampling and testing for fortified brown sugars and fortified plantation (mill) white sugar intended for direct human consumption.

2 Normative references

The following normative documents contain provisions which, through reference in this text constitute provisions of this draft Standard

EAS 16 Plantation (Mill) white sugar — Specification
EAS 38, Labelling of prepackaged foods — Specification
EAS 39, Code of practice for hygiene in the food and drink manufacturing industry
EAS 103, Schedule for permitted food additives
EAS 749, Brown sugars — Specifications
CAC/GL 1, Codex Alimentarius guidelines for claims.
CAC/GL 2, Codex Alimentarius nutrition labelling for claims
CAC/GL 23, Guidelines for use of nutrition and health claims
CODEXSTAN 193, Codex general Standards for contaminants and toxins in Food and Feed
CODEXSTAN 1, General standard for labelling of pre-packaged foods
CODEXSTAN 195 General standard for food additives
CAC/RCP 1, General principles for food hygiene
CAC/GL 1-1979, Codex Alimentarius guidelines for claims
CAC/GL 2-1979, Codex Alimentarius nutrition labelling for claims
CAC/GL 23-1997, Guidelines for use of nutrition and health claims
ISO 4833, Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of microorganisms – Colony-count technique at 30 degrees C
ISO 6579, Microbiology of food and animal feeding stuffs – Horizontal method for the detection of Salmonella spp.
ISO 6579, Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp
ISO 6888-3, Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) - Part 3: Detection and MPN technique for low numbers
ISO 6888-2, Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) - Part 2: Technique using rabbit plasma fibrinogen agar medium
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 7251, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique

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ISO 7954, Microbiology – General guidance for enumeration of yeasts and moulds - Colony count technique at 25 OC

ICUMSA Method GS 1/2/3/9-1, The Determination of the Polariisation of Raw Sugar by Polarimetry
ICUMSA Method GS 1/3/4/7/8-13, The Determination of Conductivity Ash in Raw Sugar, Brown Sugar, Juice, Syrup and Molasses
ICUMSA Method GS 2/1/3/9-15, The Determination of Sugar Moisture by Loss on Drying
ICUMSA GS 2/3-35, The Determination of Sulphite in Brown Sugars
ICUMSA Method GS 2/3/9-19, The Determination of Insoluble Matter in White Sugar by Membrane Filtration
ICUMSA Method GS 2/9-6, The Determination of Reducing Sugars in White Sugar and Plantation White Sugar by the Modified Ofner Titrmetric Method
ICUMSA Method GS 3/4/7/8-11, The Determination of Sulphated Ash in Brown Sugar, Juice, Syrup and Molasses
ICUMSA Method GS 9/1/2/3-8, The Determination of Sugar Solution Colour at pH 7.0 by the MOPS Method

3 Terms and definitions

For the purposes of this standard the definitions in EAS 16 and EAS 749 and the following terms and definitions shall apply:

3.1 diluent
a suitable, inert, edible food-grade carrier for micronutrients

3.2 fortificant
a compound which contains the specified micronutrient intended to be added to a food vehicle

3.3 food fortification
the practice of deliberately adding essential micronutrients in a food to improve the nutritional quality of the food and to provide a public health benefit with minimal risk to health

4 Requirements

4.1 General requirements

Fortified sugars shall be

a) free-flowing crystals;

b) practically free from dirt, foreign and extraneous matter; and

c) Free from fermented, musty or undesirable odours.

4.2 Compositional requirements

Fortified sugars shall conform to the compositional requirements provided in Table 1.
Table 1 — Composition requirements for fortified sugars

<table>
<thead>
<tr>
<th>SI No</th>
<th>Characteristic</th>
<th>Requirement/limits</th>
<th>Methods of test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Light brown</td>
<td>Brown sugar</td>
</tr>
<tr>
<td>(i)</td>
<td>Polarisations, ≥ Z, min.</td>
<td>99.2</td>
<td>99.0</td>
</tr>
<tr>
<td>(ii)</td>
<td>Invert sugar content, % m/m, max.</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>(iii)</td>
<td>Conductivity ashes, % m/m, max.</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>(iv)</td>
<td>Moisture content (loss on drying for 3 h at 105 °C ± 2 °C), % m/m, max.</td>
<td>0.15</td>
<td>0.2</td>
</tr>
<tr>
<td>(v)</td>
<td>Colour, in ICUMSA units, max</td>
<td>700</td>
<td>1300</td>
</tr>
<tr>
<td>(vi)</td>
<td>Sulphur dioxide, mg/kg, max.</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>(vii)</td>
<td>Water insoluble matter, mg/kg, max.</td>
<td>250</td>
<td>250</td>
</tr>
</tbody>
</table>

5 Fortification requirements

5.1 Levels of Vitamin A

The fortified sugar shall conform to the requirements and the levels of vitamin A provided in Table 2.

Table 2: Requirements for vitamin A in fortified sugar

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Fortificant compound</th>
<th>Recommended factory level</th>
<th>Regulatory levels, mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vitamin A (Retinyl) palmitate</td>
<td>10±5</td>
<td>2</td>
</tr>
</tbody>
</table>

5.2 Fortificants

Vitamin A shall be added in the form of stabilized vitamin A compound or premixes of oily nature, such as oily vitamin A which guarantees the stability of the vitamin A in the sugar.

Fortificant for use shall be stable compounds conforming to specifications in any of the following documents:

- British Pharmacopoeia (BP),
- Food Chemical Codex (FCC),
- Merck Index (MI),
- United States National Formulary (USNF),

Countries may add other micronutrients if available country data indicate deficiency in such nutrients.
6 Food additives

Fortified sugars may contain only those food additives and in amounts as specified in EAS 103.

7 Contaminants

7.1 Heavy metals

Fortified sugars shall comply with those maximum limits for heavy metals established in CODEXSTAN 193.

7.2 Pesticide residues

Fortified sugars shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

NOTE 1: Where the use of certain pesticides is prohibited by some Partner States, then it shall be notified to all Partner States accordingly.

8 Hygiene

Fortified sugar shall be produced, prepared and handled in accordance with the provisions of appropriate sections of EAS 39.

Table 3 — Microbiological limits for fortified sugars

<table>
<thead>
<tr>
<th>Microbiological parameter</th>
<th>Limits</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Plate Count (mesophytic), cfu/g, max</td>
<td>$10^3$</td>
<td>ISO 4833,</td>
</tr>
<tr>
<td>Yeast and moulds, cfu/10 g, max</td>
<td>50</td>
<td>ISO 7954</td>
</tr>
<tr>
<td>Escherichia coli, cfu/g, max</td>
<td>&lt;1</td>
<td>ISO 7251</td>
</tr>
<tr>
<td>Salmonella, per 25 g</td>
<td>Absent</td>
<td>ISO 6579</td>
</tr>
</tbody>
</table>

9 Packaging

Fortified sugars shall be packaged in food grade, non-absorbent materials which does not have adverse influence upon effects on the composition of the product including its nutritional value, properties and appearance.

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

NOTE 2: The package fill shall conform to the requirements of the legal metrology of the destination country.

NOTE 3: EAS community partner states are signatory to the (ILO) for maximum package weight for 50kg per load where human loading and offloading is involved.
10 Labelling

10.1 General labelling

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

a) The name of the product as light brown sugar, brown sugar, plantation (mill) white sugar and any other name from country of origin reflecting nature of the product. The words ‘fortified with Vitamin A’ shall be declared in close proximity to the name of the 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; and

d) The country of origin of the product shall be declared.

e) Batch or lot number in code or clear format

f) Date of manufacture of the sugar, in reference to the date of fortification, in the form ‘month and year’

g) Best before date of the sugar, in reference to the date of fortification, in the form ‘month and year’

h) Instructions on disposal of used package;

i) Each product unit may also be marked with the national food fortification Logo, where the industry qualifies to use the mark.

10.2 Nutrition labelling

The amount of vitamin A in the fortified sugar shall be declared on the label in accordance with CAC/GL 2.

10.3 Nutrition and health claims

Fortified sugar may have claims on the importance of the vitamin A in nutrition and health. Such claims when declared shall be consistent with CAC/GL 1 and CAC/GL 23.

11 Method of sampling

11.1 General requirements for sampling

In drawing, preparing, storing and handling 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.

g) Samples shall be protected from light as far as practicable and shall be stored in a cool, dry place.
11.2 Scale of sampling

11.2.1 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.

11.2.2 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 \( \frac{N}{n} \), 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.

11.3 Preparation of samples

11.3.1 Procedure

From the top, middle and bottom portions of each of the selected bags (see 11.2), 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 11.1(f).

11.3.2 Number of tests

The composite sample prepared as under 11.3.1 shall be tested for the characteristics as prescribed in Table 1.

11.3.3 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.

12 Methods of Testing

Testing for micronutrients may be conducted using any ECSA methods of test.