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DRAFT EAST AFRICAN STANDARD

Dried Mango — 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.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. 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 Principles and procedures for development of East African Standards.

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.

The committee responsible for this document is Technical Committee EASC/TC ###, *[name of committee]*, Subcommittee SC ##, *[name of subcommittee]*.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

This *second/third/...* edition cancels and replaces the *first/second/...* edition (EAS nnn-n:yyy), which has been technically revised.

*EAS nnn consists of the following parts, under the general title **Introductory element — Main element**:*

Dried mango — Specification

1 Scope

This Draft East Africa Standard specifies requirements and methods of sampling and test for dried mangoes from *Mangifera indica* intended for direct human consumption or for other use in the food industry.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

AOAC 999.11, *Determination of lead, iron, copper and zinc in food*

EAS 38, *General standard for labeling of prepackaged foods*

EAS 39, *Code of practice for hygiene in the food and drink manufacturing industry*

ISO 21527-1, *Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of yeasts and moulds -- Part 1: Colony count technique in products with water activity greater than 0.95*

ISO 4832, *Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coliforms -- Colony-count technique*

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 6579, *Microbiology of food and animal feedingstuffs — Horizontal methods for the detection of Salmonella spp.*

ISO 6636-2, *Fruits, vegetables and derived products -- Determination of zinc content -- Part 2: Atomic absorption spectrometric method*

ISO 6634, *Fruits, vegetables and derived products -- Determination of arsenic content -- Silver diethyldithiocarbamate spectrophotometric method*

ISO 21872, *Microbiology of the food chain — Horizontal method for the detection of potentially enteropathogenic Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus*

ISO 7952, *Fruits, vegetables and derived products -- Determination of copper content -- Method using flame atomic absorption spectrometry*

ISO 2447, *Fruit and vegetable products -- Determination of tin*

3 Terms and definitions

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

- 3.1 dried mango**
dried fruit of the species scientifically known as *Mangifera indica* (L.) of Anacardiaceae family.
- 3.2 immature mango**
mangoes which are not fully developed.
- 3.3 Immature dried mango**
Dried mango processed from an immature mango fruit, having poor flavour, hard tissue and undesirable appearance.
- 3.4 overripe mango**
passed beyond maturity or ripeness towards decay
- 3.5 broken dried mango**
piece of dried mango fruit smaller than a normal set slice.
- 3.6 spoiled dried mango**
Dried mango fruit that is darkened in colour or showing presence of mushy tissue, visible decomposition caused by bacteria, fungi, visible mould hyphae or any other indicating spoilage or infection.
- 3.7 pest infested dried mango**
Dried mango fruit damaged by insect and/or mite infestation
- 3.8 extraneous matter**
dirt, pieces of skin, calyx, leaf, peduncle, twigs, bits of wood, soil or any other foreign matter among or on the dried mango
- 3.9 fermented dried mango**
dried mango damaged by fermentation to the extent that the characteristic appearance and/or flavour is substantially affected
- 3.10 mineral impurities**
the acid insoluble ash content
- 3.11 food grade material**
materials that will safeguard the hygienic, safety, nutritional, technological, and organoleptic qualities of the product

4 Requirement

4.1 General requirements

4.1.1 Odour and taste

Dried mangoes shall have an odour and taste characteristic of the variety. They shall be free from foreign odour and traces of odour coming from abnormal fermented mangoes.

4.1.2 Freedom from insects, mould, mite and other parasites

Dried mangoes, shall be free from living insects, mites or other parasites and moulds, and shall be practically free from dead insects, live insect fragments and rodent contamination visible to the naked eye or with magnifying lens. If the magnification exceeds X10, this fact shall be stated in the test report.

4.1.3 Extraneous matter

The proportion of extraneous matter shall not exceed the class values given in Table 1.

4.1.4 Pest infested dried mango

The proportion of pest infested and spoiled dried mangoes shall not exceed the class value given in Table 1.

4.1.5 Immature dried mangoes

The proportion of immature dried mangoes shall not exceed the class values given in Table 1.

4.1.6 Spoiled dried mangoes

The proportion of spoiled dried mangoes shall not exceed the class values given in Table 1.

4.1.7 Colour

The colour of dried mangoes shall be characteristic of the variety

4.2 Classification

Dried mangoes are classified into three classes as follows:

4.2.1 Extra class

Dried mangoes in this class shall have a uniform colour, shape and surface. They shall not exceed the allowance percentages for the various defects given in table 1.

4.2.2 Class I

Dried mangoes in this class satisfy the requirements given in table 1. They shall be characteristic of the variety. They shall satisfy the requirements given in Table 1.

The following slight defects are allowed, provided that these do not affect the general appearance of the product, the keeping quality or presentation in the package.

- a) Slight defects in shape
- b) Slight defects in colour
- c) Slight defects on the surface

4.2.3 Class II

Dried mangoes in this class shall satisfy the requirements specified in Table 1.

The following defects are allowed, provided that the dried mangoes retain their essential characteristics as regards general appearance and presentation.

- a) Defects in shape
- b) Defects in colour
- c) Surface defects

Table 1— Class defect classification limit

Class	Pest infested dried mango % (m/m), max	Spoiled dried mango % (m/m), max	Broken dried mango % (m/m), max	Immature dried mango % (m/m), max	Extraneous matter % (m/m), max
<i>Extra</i>	1	2 ^{b)}	5 ^{c)}	1	0.5
<i>Class I.</i>	2	3	10	2	1.0
<i>Class II</i>	3	4	15	4	1.5
<i>Method of test</i>	Annex B				

4.3 Size requirement

Sizing of dried mango is determined by the width of the widest part. Table 2 presents the minimum width and thickness is required for each class.

Table 2— Minimum width and thickness of dried mangoes

Class	Width	Thickness
<i>Extra</i>	30 mm	3-5 mm
<i>Class I.</i>	22 mm	3-5 mm
<i>Class II</i>	18 mm	3-5 mm

4.4 Specific requirement

Dried mango shall conform to the compositional requirement in Table 3.

Table 3 — Compositional requirement of dried mango

Sn	Characteristics	Requirement	Test methods
1	Moisture content (Max %) for non-chemically preserved dried mango dried mangoes chemically preserved (m/m) max %.	15 25	Annex B
2	Acid insoluble ash content % (m/m)	0.1	ISO 763

5 Food additives and processing aids

The following additives may be used as preservatives of dried mango at levels specified in Codex Alimentarius Commission

- a) Benzoates
- b) Hydroxybenzoate
- c) Sorbates
- d) Sulphur dioxide

6 Contaminants

6.1 Pesticide residues

Dried mangoes shall conform to the pesticide residue limits prescribed by the Codex Alimentarius Commission of the respective commodity.

6.2 Metal contaminants

Dried mangoes shall not contain metal contaminants in excess of the quantities specified in Table below

Table 4 — Metal contaminants

Metal	Maximum (mg/kg)	Method of test
<i>Arsenic (as As)</i>	0.2	ISO 6634
<i>Copper (as Cu)</i>	1.5	ISO 7952
<i>zinc (as Zn)</i>	5	ISO 6636-2
<i>Lead (as Pb)</i>	0.1	ISO 6633

7. Hygiene

7.1 Dried mango shall be produced and handled in a hygienic manner in accordance with EAS 39.

7.2 Dried mango shall conform to the limits for microbiological contaminants in Table The product shall conform to the microbiological limits stated in Table 5

Table 4 — Microbiological limits

Microorganism	Limit	Method of test
Total plate count, (cfu/g), maximum	10 ⁵	ISO 4833 (all parts

<i>Coliform</i> , (cfu/g), maximum	100	ISO 4832
Yeasts and moulds, (cfu/g), maximum	10 ³	ISO 21527-1
<i>Salmonella sp.</i> , cfu/ 25g	Absent	ISO 6579
<i>Staphylococcus aureus</i> , cfu /g	50	ISO 6888-1
E.coli cfu/ g	Absent	ISO

8 Packaging

Dried mango shall be packaged in food grade containers.

9 Weights and measures

Dried mango shall be packaged in accordance with the Weights and Measures of Partner States' regulations

10 Labelling

The products covered by the provisions of this Standard shall be labelled in accordance with EAS 38 and shall be legibly and indelibly marked or labeled with the following information:

- a) Name of the product 'Dried mango'
- b) Name and address of the producer or packer
- c) Declaration of preservative by common name or international numbering; if any
- d) Batch/Lot number in code or in clear
- e) Net weight in gm or kg
- f) Class of the product
- g) Country of origin, including area of production
- h) Date of packing/manufacture
- i) Best before date
- j) Brand or trade name, if any
- k) Storage condition

10 Methods of sampling

Sampling shall be in accordance with Annex C and test shall be done in accordance with methods specified in the relevant Tables and annexes of this Standard

Annex A

Determination of the content of pest-infested and spoiled dried mango, immature fruits, extraneous matter and deviations from main colour.

A.1 Principle

Visual inspection of a test portion of dried mangoes. Physical separation of the damaged pieces, immature fruits and extraneous matter from the sound, healthy and ripe pieces of the sample.

A.2 Procedure

Weigh to the nearest 0.02g, a test portion of about 599 g. Separate carefully, by hand or using tweezers the pest-infested and spoiled dried mango, immature fruits, extraneous matter and the dried mango which show deviations from the main colour.

Weigh to the nearest 0.02 g, each of the categories separately.

A.3 Expression of results

The proportion, p , expressed as a percentage by mass, of each category separately is equal to;

$$P = \frac{m_1}{M_0} \times 100$$

Where:

M_0 is the mass, in grams, of the test portion

M_1 is the mass, in grams of the relevant category (see A-2)

A.4 Test Report

The test report shall specify;

- a) All information necessary for the complete identification of the sample;
- b) The sampling method used, if known;
- c) The test method used, with reference to this East Africa Standard;
All operating details not specified in this East Africa Standard; or regard as optional, together with details of any incidents which may have influenced the test result(s);
- e) The test result(s) obtained, or, if the repeatability has been checked, the final quoted result obtained.

Annex B

Determination of moisture content

B.1 Principle

Heating and drying of test portion of dried mango at a temperature of 70 °C \pm 1 °C under pressure not exceeding 13kPa (100 mmHg).

B.2 Materials

Use only materials of recognized analytical grade and distilled or demineralized water or water of equivalent purity.

B.2.1 Sand

B.3 Apparatus

Usual laboratory apparatus and, in particular the following:

B.3.1 Electrical oven, capable of being maintained at 70°C \pm 1 °C at a pressure of 13 kPa (100 Hg).

B.3.2 Dish, of corrosion-resistant metal, of diameter about 8.5 cm, with tight-fitting lid.

B.3.3 Fruit chopper made of a material, which does not absorb moisture.

B.3.4 Desiccators, containing an effective desiccant

B.3.4 Steam bath

B.3.6 Balance, capable of weighing to the nearest 0.01 g.

B.4 Preparation of test sample

Take approximately 50.0g dried mango and pass it through the fruit chopper (B.3.3) three times, mixing thoroughly after each grinding. Keep it in a completely filled, airtight, closed container to prevent absorption of water.

B.5 Procedure

B.5.1 Preparation of dish and lid

Add about 2 g of sand (B.2.1) to the dish (B.3.2) and dry, with the lid for 2h in the oven (B.3.1) set at 70°C. Leave to cool to room temperature in the desiccators (B.3.4) and weigh sample to the nearest 0.01 g. Repeat the same drying procedure until a constant weight is achieved.

B.5.2 Test Portion

Weigh, to the nearest 0.02 g, about 5 g of the test sample (B.4) and spread this test portion as evenly as possible over the bottom of the dish (B.3.2) containing the sand (B.2.1).

B.5.3 Determination

Moisten the test portion and sand (B.5.2) thoroughly with a few milliliters of hot water. Mix the test portion sand with a spatula. Wash the sample residue on the spatula into the dish with the minimum volume of hot

water, Heat the open dish on the steam bath (B.3.5) to evaporate the water to dryness. Then put the dish, with the lid alongside, in the electric oven (B.3.1) set at 70 °C and continue drying for 6 hrs under a pressure not exceeding 13 kPa (100 mmHg). Do not open the electric oven during this period. During drying admit to the oven a slow current of air (about 2 bubbles per second) dried by passing through sulfuric acid. The metal dish shall be placed in direct contact with the metal shelf of oven. After drying, remove the dish, cover it immediately with its lid and place it in the desiccators (B.3.4). After cooling to room temperature, weigh it, still covered to the nearest 0.02 g.

B.6 calculation

The moisture content, m , expressed as a percentage by mass, of the test portion is equal to;

$$m = \frac{m_1 - m_2}{m_1 - m_0} \times 100$$

Where:

M_0 is the mass, in grams, of the dish with its lid and the sand;

M_1 is the mass, in grams, of the dish with its lid and the sand with the test portion before moistening and oven drying;

M_2 is the mass, in grams, of the dish with its lid and the sand with the test portion after oven drying

Give the result to one decimal place.

B.7 Repeatability

The absolute difference between two independent single test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time, should not be greater than 0.2 g of water per 100 g of sample.

NOTE: If it is required to check whether the repeatability requirement is met, carry out two single determinations in accordance with B.5.1 to B.5.3 under repeatability conditions.

B.8 Test report

The test report shall specify;

- a) All information necessary for the complete identification of the sample;
- b) The test method used, with reference to this Tanzania Standard.
- c) All operating details not specified in this Tanzania Standard or regarded as optional together with details of any incidents which may have influenced the test result(s).
- d) The test result(s) obtained, or, if the repeatability has been checked, the final quoted result obtained.

Annex C (normative)

Sampling

C.1 Definitions

C.1.1

lot
collection of primary containers or units of the same size, type, and style manufactured or packed under similar conditions and handled as a single unit of trade

C.1.2

lot size
number of primary containers or units in the lot

C.1.3

sample size
total number of sample units drawn for examination from a lot

C.1.4

sample unit
container, a portion of the contents of a container, or a composite mixture of product from small containers that is sufficient for the examination or testing as a single unit. For fill of container, the sample unit shall be the entire contents of the container

C.2 Sampling plans

Lot size (primary containers)	Size of container, n^1
Net weight equal to or less than 1 kg (2.2 lb)	
4 800 or less	13
4 801 to 24 000	21
24 001 to 48 000	29
48 001 to 84 000	48
84 001 to 144 000	84
144 001 to 240 000	126
Over 240 000	200
Net weight greater than 1 kg (2.2 lb) but not more than 4.5 kg (10 lb)	
2 400 or less	13
2 401 to 15 000	21
15 001 to 24 000	29
24 001 to 42 000	48
42 001 to 72, 000	84
72 001 to 120 000	126
Over 120 000	200
Net weight greater than 4.5 kg (10 lb)	
600 or less	13
601 to 2 000	21
2 001 to 7 200	29
7 201 to 15 000	48
15 001 to 24 000	84
24 001 to 42 000	126
Over 42 000	200
¹ n = number of primary containers in sample.	

Bibliography