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DRAFT EAST AFRICAN STANDARD

Ginger — Specification

EAST AFRICAN COMMUNITY

First Edition 2017

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. XXXXXX.

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 006, *Spices culinary herbs and condiments*.

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.

Ginger — Specification

1 Scope

This Draft East African Standard specifies the requirements and methods of sampling and test for dried ginger, of the species *Zingiber officinale* Roscoe, whole, in pieces and ground.

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.

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

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

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

EAS 99, *Spices and condiments — Terminology*

ISO 927, *Spices and condiments — Determination of extraneous matter and foreign matter content*

ISO 928, *Spices and condiments — Determination of total ash*

ISO 930, *Spices and condiments — Determination of acid insoluble ash*

ISO 939, *Spices and condiments — Determination of moisture content Entrainment method*

ISO 948, *Spices and condiments — Sampling*

ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of micro-organisms — Part 1: Colony-count at 30 degrees C — Pour plate technique*

ISO 6571, *Spices and condiments — Determination of volatile oil content (hydro distillation method)*

ISO 6579, *Microbiology of food and animal feeding stuffs — Part 6: Horizontal method for the detection of Salmonella spp.*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 7954, *Microbiology of food and animal feeding stuffs — General guidance for enumeration of yeasts and moulds — Part 8: Colony count technique at 25 degrees C*

ISO 16050, *Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EAS 99 and the following apply.

extraneous matter
includes dust, dirt, stones, clay particles and pieces of wood, all particles originating from the plant other than ginger

4 Requirements

4.1 General requirements

4.1.1 Ginger whole and in pieces shall be dried peeled or unpeeled rhizome of *Zingiber officinale* Roscoe;

4.1.2 Ginger in pieces shall be irregular in shape, and size not less than 20 mm in length or in small cut pieces; very pale buff to pale brown in colour, fibrous; either clean peeled, scraped or coated; washed and dried .

4.1.3 The ginger may be garbled by removing pieces that are too light; it may also be lime bleached. The dried rhizomes may also be ground into powder.

4.1.4 Ground ginger is obtained by grinding ginger of species *Zingiber officinale* Roscoe without adding any foreign matter to the ginger.

4.1.5 Ginger whole, in pieces or ground shall have the odour and flavour characteristic of the product and shall be whole-some.

4.1.6 Ginger, whole, in pieces or ground shall be free from fungi, insect infestation, dead insects, insect fragments and rodent contamination

4.2 Specific quality requirements

4.2.1 Ginger, whole, in pieces and ground shall comply with the specific quality requirements specified in Table 1.

Table 1 — Quality requirements for ginger

S/No.	Characteristic	Requirement		Test method
		Whole or pieces	Ground	
i)	Moisture % m/m, max.	12	11	ISO 939
ii)	Volatile oil ml/100 g %m/m, min.	1.5	1	ISO 6571
iii)	Total ash % m/m, max.			
	a) Unbleached	8	8	ISO 928
	b) bleached	12	12	
iv)	Acid insoluble ash % m/m, max.	1.5	1.5	ISO 930
v)	Calcium (as oxide) on dry basis:			
	a) Unbleached, max. mass fraction	1.1	1.1	Annex A
	b) bleached (optional)[1] max. mass fraction	2.5	2.5	
vi)	Extraneous matter, % m/m, max.	2	-	ISO 927
[1]On agreement between the buyer and seller				

4.2.2 Ground ginger shall be free from coarse particles and shall be ground to such fineness that whole of the material passes through a sieve of 500 micron (0.5 mm) aperture size.

5 Food additives

Ginger, whole, in pieces and ground shall be free from added colouring matter, flavour and preservatives.

6 Contaminants

6.1 Pesticide residues

Pesticide residues in ginger, whole, in pieces and ground shall not exceed maximum residue limit as established by the Codex Online guideline for pesticide residue in food.

6.2 Heavy metal

Heavy metals in ginger, whole, in pieces and ground shall not exceed maximum residue limit as stipulated in Codex Stan 193.

6.3 Aflatoxin

Total aflatoxin shall not exceed 10 µg/L and aflatoxin B_1 shall not exceed 5 µg/L when tested with ISO 16050

7 Hygiene

Ginger, whole, in pieces and ground shall be processed and handled in a hygienic manner in accordance with EAS 39 and shall conform to the microbiological limits stipulated in Table 2.

Table 2 — Microbiological limits for Ginger, whole, in pieces and ground

S/No.	Organism	Limit	Test method
i)	Total plate count, cfu/mL, max.	$1*10^5$	ISO 4833-1
ii)	Yeast and mould cfu/g, max.	$1*10^3$	ISO 7954
iii)	Salmonella spp. per 25 g, max.	Absent	ISO 6579
v)	*Escherichia coli* MPN/g, max.	Absent	ISO 7251

8 Weights and measures

The weight and fill of ginger, whole, in pieces and ground shall comply with the weights and measures regulations of Partner States or equivalent legislation.

9 Packaging

9.1 Whole ginger shall be packed in clean, gunny-bags, paper bags or food grade polyethylene bags. Ginger powder shall be packed in clean tamper-proof, or glass containers or aluminium foil packs or cellophane bags. The bags or containers for whole ginger shall, be free from any fungal or insect infestation and shall, be free from any undesirable smell.

9.2 The packaging shall be easy to sterilize, shall not be a source of contamination, and shall protect the product safety and quality during transportation and storage.

10 Labelling

In addition to the requirements of EAS 38, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

a) Common name of the product;

b) Brand name or trade name if any;

c) name, physical location and address of manufacturer;

d) ingredients;

e) net weight;

f) year of harvest if applicable;

g) date of packing;

h) batch identification number/code;

i) best before;

j) country of origin; and

k) Storage condition.

11 Sampling

Sampling of Ginger, whole, in pieces and ground shall be done in accordance with ISO 948.

Annex A
(normative)

Determination of calcium

A.1 Terms and definitions

For the purposes of this annex, the following terms and definitions apply

A.1.1 Calcium content

Mass fraction of substances determined under the conditions specified in this standard.

NOTE — The calcium content is expressed as a percentage mass fraction of calcium oxide.

A.2 Principle

A test portion is incinerated to give the total ash. The ash is treated with hydrochloric acid to precipitate the calcium as calcium oxalate, which is then titrated against potassium permanganate.

A.3 Reagents

Unless otherwise stated, use only reagents of recognized analytical grade, and only distilled or deionized water or water of at least equivalent purity.

A.3.1 Acetic acid

A.3.2 Concentrated hydrochloric acid, $\rho 20$ (HCl) = 1.16 g/ml.

A.3.3 Dilute hydrochloric acid

Dilute 2 volumes of concentrated hydrochloric acid (A.3.2) with 5 volumes of water

A.3.4 Ammonium hydroxide solution, $\rho 20$ (NH_4OH) = 0.90 g/ml

A.3.5 Ammonium oxalate, saturated solution

A.3.6 Sulfuric acid, mass fraction solution

Dilute 1 volume of concentrated sulfuric acid, $\rho 20$ (H_2SO_4) = 1.84 g/ml, with 4 volumes of water.

A.3.7 Potassium permanganate, $c(KMnO_4)$ = 0.05 mol/l standard volumetric solution

A.3.8 Bromocresol green indicator, 0.4 g/l solution

Weigh (A.4.6), to the nearest 0.001g, 0.1g, of bromocresol green and grind it with 14.3 ml of 0.01 mol/l sodium hydroxide solution in an agate mortar (A.4.8). Transfer the contents of the mortar quantitatively to a 250 ml one-mark volumetric flask (A.4.7) and make up to the mark with water. This solution has a pH range of 3.8 to 5.4. It turns yellow in an acid medium and blue in an alkaline medium.

A.4 Apparatus

Usual laboratory equipment, and in particular the following.

A.4.1 Incineration dish

A.4.2 Filter paper, ash less

A.4.3 Beaker, of capacity 250 ml

A.4.4 Steam bath

A.4.5 Water bath

A.4.6 Analytical balance

A.4.7 Volumetric flasks

A.4.8 Agate mortar

A.5 Procedure

A.5.1 Test portion

Weigh (A.4.6), to the nearest, 0.001 g to 4 g of the product

A.5.2 Determination

Incinerate the test portion by the method specified in ISO 928. Digest the ash in the dish (A.4.1) with the dilute hydrochloric acid (A.3.3). Evaporate to dryness on the steam bath (A.4.4). Digest the dry residue again with the dilute hydrochloric acid and again evaporate to dryness. Treat the residue with 5 ml to 10 m of the concentrated hydrochloric acid (A.3.2), then add about 50 ml of water. Allow to stand on the water bath for a few minutes, and filter into the 250 ml beaker. Wash the insoluble residue with hot water, collecting the washings in the same beaker. Add to the beaker 8 drops to 10 drops of the bromocresol green (A.3.8) and add the ammonium hydroxide solution (A.3.4) until the colour of the solution is distinctly blue (pH 4.8 to pH 5.0). Add acetic acid (A.3.1) drop by drop to change the colour to distinct green, i.e. until the pH is changed to between 4.4 and 4.6.

Filter the solution quantitatively, collecting the filtrate and washings in the beaker. Boil the solution and add the ammonium oxalate solution (A.3.5) drop wise until a precipitate forms and then add an excess. Heat to boiling. Allow to stand for at least 3 h. Decant the clear solution through the filter paper (A.4.2). Pour 13 to 20 ml of hot water on to the precipitate and again decant the clear solution.

Dissolve any precipitate and again decant the clear solution. Dissolve any precipitate remaining on the filter paper by washing with hot dilute hydrochloric acid (A.3.3) into the original beaker. Wash the filter paper thoroughly with hot water. Then reprecipitate while boiling hot, by adding sufficient ammonium hydroxide solution (A.3.4) and a little ammonium oxalate solution (A.3.5). Allow to stand for at least 3 hour, as before, then filter through the same filter and wash with hot water until the filtrate is chloride free.

Perforate the apex of the filter cone. Wash the precipitate into the beaker used for precipitation. Then wash the filter paper with hot sulfuric acid (A.3.6) and titrate the solution at a temperature not lower than 70 ˚C against the potassium permanganate solution (A.3.7) until the appearance of a persistent pink coloration.

A.6 Expression of results

The calcium content *(w*CaO), expressed as a percentage mass fraction of calcium oxide, is given by Equation (A.1):

$$wCaO = \frac{0.028 \times V \times 100}{m}$$

Where

m- is the mass, in grams, of the test portion (A.5.1);

V- is the volume, in milliliters, of the potassium permanganate solution (A.3.7) required for the titration

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