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**High quality cassava flour — Specification**



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## Introduction

High quality cassava flour (HQCF) can be used as an alternative for starch and other imported materials like wheat flour in a number of industrial undertakings. High quality cassava flour can be used in the production of adhesives for paperboard manufacture, as an extender for plywood glues, as a source of starch in textile sizing and as a raw material for the production of glucose syrups, industrial alcohol and bakery products.

The processing of cassava into high quality cassava flour involves peeling, washing, grating/slicing/chipping, pressing, disintegration, sifting, drying, milling, screening, packaging and storage.

High quality cassava flour can be prepared from both sweet and bitter varieties.

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## High quality cassava flour — Specification

### 1 Scope

This African Standard specifies requirements and methods of sampling and test for high quality cassava flour, which is obtained from the processing of cassava (*Manihot esculenta* Crantz), intended for human consumption, industrial use and other applications.

### 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.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

ARS 471, *Food grade salt — Specification*

CD-ARS 835-2013, *Fresh sweet cassava — Specification*

CD-ARS 836-2013, *Fresh bitter cassava — Specification*

CD-ARS 839-2013, *Dried cassava chips — Specification*

CD-ARS 844:2013, *Cassava and cassava products — Determination of total cyanogens — Enzymatic assay method*

CODEX Stan 192, *General standard for food additives*

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

ISO 1666, *Starch — Determination of moisture content — Oven-drying method*

ISO 1842, *Fruit and vegetable products — Determination of pH*

ISO 2171, *Cereals, pulses and by-products — Determination of ash yield by incineration*

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

ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*

ISO 5498, *Agricultural food products — Determination of crude fibre content — General method*

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

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*

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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 6888-3, *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 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 10520, *Native starch — Determination of starch content — Ewers polarimetric method*

ISO 16050, *Foodstuffs — Determination of aflatoxin B<sub>1</sub>, and the total content of aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub> in cereals, nuts and derived products — High performance liquid chromatographic method*

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/TS 21872-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 1: Detection of Vibrio parahaemolyticus and Vibrio cholerae*

ISO/TS 21872-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 2: Detection of species other than Vibrio parahaemolyticus and Vibrio cholerae*

ISO 24333, *Cereals and cereal products — Sampling*

### 3 Description and definitions

For the purpose of this standard the following definitions apply.

#### 3.1 Product description

High quality cassava flour (HQCF) is unfermented cassava flour prepared from fresh cassava roots through a process of peeling, chipping or grating followed by dewatering, drying and milling. HQCF may also be made from any of the intermediate products such as chips and/or grits. In the case of cassava flour prepared from bitter cassava, detoxification is first carried out before it undergoes drying in the form of wet cake or dried grits.

#### 3.2 Definitions

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

##### 3.2.1

##### **food grade material**

material that is free from substances that are hazardous to human health

##### 3.2.2

##### **clean**

practically free from dirt or staining and or other foreign matter present in the container

##### 3.2.3

##### **specks**

tiny marks, spots or piece of any other object present in the flour



**3.2.4****extraneous matter**

organic matter of cassava origin other than high quality cassava flour

**3.2.5****foreign matter**

organic and inorganic materials (such as sand, soil, glass) other than extraneous matter in the flour

**4 Requirements****4.1 Raw materials**

HQCF shall be produced from selected fresh cassava roots or from high quality intermediate products such as chips and grits complying with the relevant African Standards.

**4.2 General quality requirements for high quality cassava flour**

High quality cassava flour shall be:

- a) practically free from extraneous matter;
- b) free of off flavours and odours;
- c) practically free from any living insects and foreign matter;
- d) safe and suitable for human consumption; and
- e) of colour characteristic of the variety.

**4.3 Physical properties**

Testing for particle size shall be done in accordance with ISO 3588. High quality cassava flour shall have the following physical properties:

- a) Not less than 95 % by mass of high quality cassava flour shall pass through a sieve of 250  $\mu\text{m}$  mesh screen; and
- b) Extraneous matter shall not be more than 10 specks/100  $\text{cm}^2$ .

**4.4 Compositional requirements**

High quality cassava flour shall conform to the compositional quality requirements shown in Table 1

**Table 1 — Compositional requirements for high quality cassava flour**

| S/N | Parameter   | Requirement | Method of test  |
|-----|---|-------------|-----------------|
| 1   | Total acidity, %, by mass, max.                     | 0.25        | AOAC            |
| 2   | pH  | 5.5 – 7.0   | ISO 1842        |
| 3   | Acid insoluble ash, % m/m on dry matter basis, max. | 0.35        | Annex A         |
| 4   | Cyanide content, mg/kg, max.                        | 10.0        | CD-ARS 844:2013 |
| 5   | Starch content by mass, %, by mass, min.            | 60.0        | ISO 10520       |
| 6   | Moisture content, %, by mass, max.                  | 12          | ISO 1666        |
| 7   | Crude fiber, %, by mass on dry weight basis, max.   | 0.2         | ISO 5498        |

## 4.5 Chemical properties

High quality cassava flour shall:

- a) give a blue-black colouration when tested with iodine; and
- b) have a pasting temperature less than 75 °C.

## 5 Food additives

Food additives may be used in the preparation of high quality cassava flour in accordance with CODEX STAN 192.

## 6 Contaminants

### 6.1 Pesticide residues

High quality cassava flour shall conform to maximum residue limits for pesticide residues established by the Codex Alimentarius Commission for this commodity.

### 6.2 Other contaminants

**6.2.1** High quality cassava flour shall comply with the maximum levels of the Codex General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193).

**6.2.2** The product shall be free from objectionable extraneous matter.

**6.2.3** High quality cassava flour shall contain not more than 10 microgram per kilogram aflatoxin of which not more than 5 micrograms per kilogram may be aflatoxin B1 when tested in accordance with ISO 16050.

**6.2.4** The product shall be free from parasites which represent a hazard to health (see Table 2).

## 7 Hygiene

**7.1** The product covered by the provisions of this standard shall be prepared and handled in accordance with ARS 53 and the relevant public health regulations and shall conform to microbiological limits specified in Table 2.

**Table 2 — Microbiological limits for high quality cassava flour**

| S/N | Micro-organism(s)                      | Requirements    | Method of test |
|-----|--|-----------------|----------------|
| 1   | Total plate count, cfu/g               | 10 <sup>5</sup> | ISO 4833       |
| 2   | <i>Vibrio cholera</i> , cfu/g          | absent          | ISO/TS 21872   |
| 3   | <i>Escherichia coli</i> , cfu/g, max.  | absent          | ISO 7251       |
| 4   | <i>Salmonella</i> , 25g, max.          | absent          | ISO 6579       |
| 5   | Yeasts and moulds, cfu/g, max.         | 10 <sup>3</sup> | ISO 21527-1    |
| 6   | <i>Staphylococcus aureus</i> cfu/g max | 10 <sup>2</sup> | ISO 6888       |
| 7   | <i>Coliforms</i> g (per 100 g)         | absent          | ISO 4832       |

**7.2** During handling, storage and transportation, effective measures must be taken to prevent cross contamination with chemicals, microbial or physical contaminants.

## 8 Packaging

8.1 High quality cassava flour shall be packaged in food grade material which will safeguard the hygienic, physical, nutritional and organoleptic qualities of the product.

8.2 The net weight of the packages for high quality cassava flour may be required to meet the relevant regulations of the destination country.

## 9 Labelling

9.1 In addition to the requirements of ARS 56, the following specific labelling requirements shall apply and shall be **legibly** and **indelibly** marked:

- a) Common name of the product "High quality cassava flour";
- b) Name, and physical address of the manufacturer/ distributor and /or trade name/ brand name;
- c) Declaration of preservative by common name or international number if any;
- d) Date of manufacture;
- e) The words "Human food, store in cool dry place"; away from contaminants;
- f) Lot / batch identification in code or clear;
- g) Expiry date;
- h) Country of origin;
- i) The net weight in metric units; and
- j) Instructions on disposal of used package.

9.2 When labelling non-retail packages, information for non-retail packages shall either be given on the packages or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the packages.

## 10 Sampling

Sampling of high quality cassava flour shall be done in accordance with ISO 24333.

## 11 Criteria for conformity

A lot shall be declared as conforming to this standard if samples inspected or analysed for quality requirements conform to the provisions of this standard.

**Annex A**  
(normative)**Determination of acid insoluble ash****A.1 Reagent****A.1.1 Dilute Hydrochloric Acid** — 1:1, prepared from concentrated hydrochloric acid.**A.2 Procedure****A.2.1** Weigh accurately about 2 g of the dried material in a tared porcelain, silica or platinum dish. Ignite with a meker burner for about 1 hour. Complete the Ignition by keeping in a muffle furnace at 500 °C to 570 °C until grey ash results.

Cool and filter through whatman filter paper No. 42 or its equivalent. Wash the residue with hot water until the washings are free from chlorides as tested with silver nitrate solution and return the filter paper and residue to the dish. Keep it in an electric air oven maintained at  $135 \pm 2$  °C for about 3 hrs. Ignite the dish again for about 30 minutes, cool and weigh. Repeat this process till the difference between two successive weighings is less than 1 mg. Note the lowest weight.

**A.3 Calculation****A.3.1** Acid insoluble ash, per cent by weight

$$= \frac{100(M_2 - M)}{M_1 - M}$$

where,

 $M_2$  = the lowest weight, in g, of the dish with the acid insoluble ash; $M$  = weight, in g, of the empty dish; and $M_1$  = weight, in g, of the dish with the dried product taken for the test.

**Bibliography**

EAS 779:2012, *High quality cassava flour — Specification*

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