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## Cassava crisps — Specification

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## National foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 210, of the Laws of Uganda, as amended. UNBS is mandated to coordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO),
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of representatives of consumers, traders, academicians, manufacturers, government and other stakeholders.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

This Draft Uganda Standard, DUS DARS 843: 2024, *Cassava crisps — Specification*, is identical with and has been reproduced from a Draft African Standard, DARS 843: 2024, *Cassava crisps — Specification*, and adopted as a Uganda Standard.

The committee responsible for this document is Technical Committee UNBS/TC 204, *Fruits, vegetables, tubers and processed products*.

This standard will cancel and replace US EAS 743:2010, *Cassava crisps — Specification*.

Wherever the words, "African Standard" appear, they should be replaced by "Uganda Standard".

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**Cassava crisps — Specification**



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## **Foreword**

The African Organization for Standardization (ARS) is an African intergovernmental organization made up of the United Nations Economic Commission for Africa (UNECA) and the Organization of African Unity (AU). One of the fundamental mandates of ARSO is to develop and harmonize African Standards (ARS) for the purpose of enhancing Africa's internal trading capacity, increase Africa's product and service competitiveness globally and uplift the welfare of African communities. The work of preparing African Standards is normally carried out through ARSO technical committees. Each Member State interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, Regional Economic Communities (RECs), governmental and non-governmental organizations, in liaison with ARSO, also take part in the work.

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This African Standard was prepared by the ARSO Technical Committee on, Cassava value chain products (ARSO/PC 02).

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## **Introduction**

Crisps are thin slices of fruit or vegetable (usually cassava), deep-fried or baked until brittle and served as an appetizer, side dish, or snack. The crisps are just cooked and salted, but manufacturers can add a wide variety of seasonings using herbs, spices, cheese, or artificial additives.

Crisps are an important part of the snack food in the market. Crisps can be packaged in a variety of ways including tins to keep the crisps fresh until opened.

This standard is intended to provide guidance on the essential characteristics of crisps in order to promote the use cassava in the processing of crisps and ensure that products are of high quality and safety.



## Cassava crisps — Specification

### 1 Scope

This African Standard specifies requirements, sampling and test methods for crisps made from sweet varieties of cassava (*Manihot esculenta* Crantz) intended for human consumption.

### 2 Normative references

The following referenced documents 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.

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

ARS 56, *Prepackaged foods — Labelling*

ARS 471, *Food grade salt — Specification*

ARS 835, *Fresh sweet cassava — Specification*

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

CXS 192, *General standard for food additives*

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

ISO 660, *Animal and vegetable fats and oils—Determination of acid value and acidity*

ISO 712, *Cereals and cereal products — Determination of moisture content — Reference method*

ISO 11085, *Cereals, cereals-based products and animal feeding stuffs — Determination of crude fat and total fat content by the Randall extraction method*

ISO 3960, *Animal and vegetable fats and oils – Determination of peroxide value – Iodometric (visual) endpoint determination*

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

ISO 5985, *Animal and vegetable fats and oils —Determination of ash insoluble in hydrochloric acid*

ISO 6579, *Microbiology of food and animal feeding stuffs — 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 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

ISO 27107, *Animal and vegetable fats and oils — Determination of peroxide value — Potentiometric end-point determination*

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## 3 Terms and definitions

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

### 3.1

#### **cassava crisps**

thin slices of peeled and washed sweet cassava roots deep-fried or baked until crunchy

### 3.2

#### **food grade material**

material which safeguard the hygienic, nutritional, and organoleptic qualities of the product

### 3.3

#### **foreign matter**

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

### 3.4

#### **extraneous matter**

organic matter of origin other than cassava crisps

## 4 Requirements

### 4.1 Raw materials

The following materials shall be used in the processing of cassava crisps:

4.1.1 Cassava roots complying with ARS 835.

4.1.2 Edible oil or fat complying with the relevant African Standards.

NOTE Using the oil several times may lead to poor quality and affect the safety of the crisps.

### 4.2 Optional ingredients

4.2.1 Edible salt complying with ARS 471.

4.2.2 Spices and condiments complying with the relevant African Standards.

### 4.3 General requirements

4.3.1 Cassava crisps shall be light yellow to golden brown in colour. Where spices or other additives are used, the colour shall be characteristic of that ingredient.

4.3.2 Cassava crisps shall be free from off-flavour, rancidity, bitter taste and any other blemish.

4.3.3 The crisps shall be uniform in size and have a thickness of between 1.0 mm - 1.5 mm.

4.3.4 The cassava crisps shall not show any blisters or noticeable separation between the outer and the inner portions.

4.3.5 The cassava crisps shall be crunchy or crispy and free from sogginess and excessive oil.

4.3.6 Cassava crisps shall not contain more than 10 % by mass of small pieces, slivers and irregular pieces.

4.3.7 Packaged cassava crisps shall have not more than 1 % of the crisps with the following defects:

- a) surface or internal pigmentation;

- b) blisters;
- c) callous area; and
- d) black specks and spots.

#### 4.4 Specific requirements

Cassava crisps shall conform to the requirements specified in Table 1.

**Table 1 — Compositional requirements for cassava crisps**

S/N	Parameter	Requirement	Test method
i.	Moisture content, %, by mass, max.	5	ISO 712
ii.	Fat content on dry weight, %, max.	35	ISO 11085
iii.	Free fatty acids on dry weight basis, %, max.	0.5	ISO 660
iv.	Cyanide, mg/kg, max.	10	ARS 844
v.	Acid insoluble ash, %, by mass, max.	0.05	ISO 5985
vi.	Peroxide value, meq oxygen per gram, max.	0.5	ISO 3960 or ISO 27107

## 5 Food additives

Food additives may be used in the preparation of cassava crisps in accordance with CXS 192.

## 6 Contaminants

### 6.1 Pesticide residues

Cassava crisps shall conform to maximum residue limits for pesticide residues established by the Codex Alimentarius Commission for this commodity.

### 6.2 Other contaminants

Cassava crisps shall comply with the maximum levels given in CXS 193.

## 7 Hygiene

Cassava crisps shall be prepared and handled in accordance with ARS 53 and shall comply with the microbiological limits specified in Table 1 when tested in accordance with the test methods specified therein.

**Table 2 — Microbiological limits for cassava crisps**

S/N	Micro-organism	Requirement	Test method
i.	Total plate count, cfu/g, max.	10 <sup>4</sup>	ISO 4833
ii.	<i>Escherichia coli</i> , cfu/10 g	Absent	ISO 7251
iii.	Salmonella, per 25 g	Absent	ISO 6579
iv.	Yeasts and moulds, cfu/g, max.	10 <sup>2</sup>	ISO 21527-2

## 8 Packaging

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8.1 Cassava crisps shall be packaged in food grade material.

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

## 9 Marking and labelling

9.1 In addition to the requirements of ARS 56, cassava crisps shall be legibly and indelibly labelled with the following information:

- a) common name of the product 'Cassava Crisps';
- b) name, and physical address of the manufacturer/ distributor and /or trade name/ brand name;
- c) if spiced they shall be labelled 'Spiced Cassava Crisps';
- d) date of manufacture;
- e) list of ingredients;
- f) lot identification;
- g) Best before date;
- h) country of origin;
- i) the net weight in metric units;
- j) storage instructions;
- k) declaration stating "salted" or "unsalted";
- l) instructions on disposal of used package; and
- m) Nutritional profile/Information of cassava crisps need to be stated on the packaging material used.

## 10 Sampling

Sampling shall be done in accordance with ISO 874.

## Annex A (normative)

### Determination of free fatty acids

**A.1 Apparatus**, soxhlet fat extraction apparatus

**A.2 Reagents**

**A.2.1 Petroleum ether**, distilling below 65 °C, or ethyl ether

**A.2.2 Alcohol potassium hydroxide**, 0.1 N (use absolute or alcohol denatured with methanol)

**A.2.3 Alcohol-ether mixture**, equal volumes of 96 % alcohol and ethyl ether

**A.2.4 Phenolphthalein solution**, 1 % in alcohol or alcohol denatured with methanol. Add 0.3 mL per 100 mL mixture of alcohol-ether and add alcoholic KOH solution to a faint pink.

**A.3 Procedure**

**A.3.1** Extract 10.00 g ± 0.01 g of the sample taken in a thimble with petroleum ether for about 4 h in a Soxhlet extraction apparatus. Completely evaporate the solvent from the extraction flask (weighed previously) on a steam bath, cool and weigh the extraction flask with the residue. Dissolve the residue in the extraction flask with the 50 ml of the alcohol-ether phenolphthalein solution. Titrate the dissolved extract, with standard potassium hydroxide solution, to a faint pink colour, which persists for 10 s. If emulsion is formed during titration, dispel by adding a second 50 ml portion of the alcohol-ether phenolphthalein solution.

**A.3.2** Make a blank titration on 50 ml of the alcohol-ether phenolphthalein solution and subtract this value from the titration value of the sample. If the additional 50 ml portion of the alcohol-ether phenolphthalein solution is added, double the blank titration.

**A.4 Calculation**

Calculate the acid value from the following formula:

$$\text{Acid value (as oleic acid)} = \frac{56.1VN}{M}$$

where

*V* is the volume, in ml, of standard potassium hydroxide solution used;

*N* is the normality of standard potassium hydroxide solution; and

*M* is the mass, in g, of the material taken for the test.

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In proportion to the expected chloride content aliquot part of this solution, which should preferably contain 50 mg – 100 mg NaCl, taken off, distilled water being added to obtain a quantity of approximately 100 ml.

Subsequently 5 ml ferric alum solution (see C.4.4), 20 mL 0.1 N AgNO<sub>3</sub> solution (see C.4.2) and 5 ml – 10 ml ether or 1 ml nitrobenzene are added; titration is carried out by means of an ammonium thiocyanate solution 0.1 N (see C.4.3), until the red colouring remains after stirring.

### A.7 Expression of results

Report in percentage by weight to one decimal place.

$$\text{Chloride content} = \frac{5.65 (V_2 - V_3) \times V \times 100}{V_1 \times P}$$

where

- $P$  is the test portion, in mg, incinerated;
- $V$  is the ml of the stock solution derived from the ash;
- $V_1$  is the volume, in ml, stock solution used from titration;
- $V_2$  is the volume, in ml, AgNO<sub>3</sub> added;
- $V_3$  is the volume, in ml, NH<sub>4</sub>SCN necessary for back titration.

**Bibliography**

EAS 743:2010, *Cassava crisps — Specification*



