
Potato crisps – Specification

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical committee for fruit and vegetable (TC-13) and published by Ethiopian Standard Agency (ESA).

The standard has been developed to address observed needs and to support the local industry in order to make progress through upraising competitiveness and maintain comparative market advantage both domestically and internationally.

In the preparation of this standard reference has been made to the following:

EAS 745:2010, *Potato crisps — Specification.*

Codex Stan 192, *General Standard for Food Additives.*

Codex Stan 193, *General Standard for contaminants and toxins in food and feed.*

Acknowledgment has been made for the use of information from the above publications.

Potato crisps — Specification

1 Scope

This Ethiopian Standard specifies requirements and methods of sampling and test for crisps made from potato tubers (*Solanum tuberosum* L.).

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.

CES 70, Edible Salt- Specification

CES 73, General standard for prepackaged foods –Labeling.

CES 84, Potatoes- Specification.

ES 577, Recommended code of practice-General principle of food hygiene.

ES ISO 763, Fruit and vegetable products -- Determination of ash insoluble in hydrochloric

ES 929, Code of practice-food hygiene management.

ES 2834, ES 2834, Sampling plans for prepackaged foods (AQL6.5).

ES ISO 3960, Animal and vegetable fats and oils - Determination of peroxide value - Iodometric (visual) endpoint determination.

ES ISO 4833-1, Microbiology of the food chain - Horizontal method for the enumeration of microorganisms - Part 1: Colony count at 30 °C by the pour plate technique.

ES ISO 6579-3, Microbiology of the food chain - Horizontal method for the detection, Enumeration and serotyping of Salmonella - Part 3 Guidelines for serotyping of Salmonella spp.

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

ES 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.

ES 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.

ES ISO 22002-1, Prerequisite programmes on food safety -Part 1 Food manufacturing.

3 Product description

3.1

potato crisps

thin slices of peeled and washed potato tubers, deep-fried until crunchy.

4 Ingredients

4.1 Raw materials

The following materials shall be used in the manufacture of potato crisps:

- a) potato, conforming to CES 84; and
- b) edible oil or fat conforming to Ethiopian Standards.

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

4.2 Optional ingredients

In addition to the essential ingredients specified in 4.1, the following optional ingredients may be added:

- a) spices and condiments conforming to Ethiopian Standards and ;
- b) salt conforming to CES 70.

5 Requirements

5.1 General Requirements

Potato crisps shall:

- a) shall be light yellow to golden brown in colour or typical colour of the permitted additive used,
- b) be generally uniform in size and symmetry,
- c) be well cooked, crispy and free from sogginess and excessive oil,
- d) have crispy texture and the external surface shall not show any noticeable separation from the inner portion,
- e) not be rancid, bitter and have off odours and flavours, and
- f) practically free from foreign matter, adulterants and any other blemish.

5.2 Defects

Potato crisps, when packed, shall not contain more than 10 % by mass of small pieces, slivers and irregular pieces.

Packed potato crisps shall have not more than 1 % of the crisps with the following defects:

- a) surface or internal pigmentation; and
- b) black specks and spots.
- c) blisters and
- d) callous areas.

5.3 Specific Requirements

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

Table 1— Chemical compositional requirements

Characteristic	Max.Limit	Test Methods
Moisture content, %, by mass.	5	Annex A
Free fatty acids, %, by mass on dry weight basis.	0.5	Annex B
Acid insoluble ash, % by mass on dry weight basis.	0.05	ES ISO 763
Peroxide value, meq/oxygen per gram.	0. 5 mg/kg	ES ISO 3960
Fat content on dry weight basis, %.	35	
Sodium chloride (as NaCl) on dry weight basis.	2	AOAC 971.27

6 Food additives

The products covered by this Standard shall be in accordance to the *General Standard for Food Additives* (Codex Stan 192).

7 Contaminants

7.1 Pesticide residues

Potato crisps shall conform to those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

7.2 Other contaminants

Potato crisps shall comply with the maximum levels of the Codex General Standard for Contaminants and Toxins in Food and Feed (Codex Stan 193).

8 Hygiene

8.1 Potato crisps shall be manufactured and handled in a hygienic manner in accordance with ES 577, ES 929 and ES ISO 22002-1.

8.2 Potato crisps shall be free of pathogenic microorganisms to the extent that does not have health effect and shall conform to the microbiological requirements in Table 3.

Table 3 - Microbiological requirements for potato crisps

Microorganisms	Limit	Test Methods
Total plate count, cfu/g, Max.	10 ³	ES ISO 4833-1

<i>Escherichia coli</i> , cfu/g	Absent	ES ISO 7251
<i>Salmonella</i> cfu/g	Absent	ES ISO 6579-3
Yeasts and moulds, cfu/g, Max.	10 ³	ES ISO 21527-1 ES ISO 21527-2

9 Packaging and Labeling

9.1 Packaging

9.1.1 Before packaging, the crisps excess oil shall be removed. The crisps shall be packaged within a short time after frying so as to keep the crispy taste and texture of the crisps.

9.1.2 The product shall be packed in food grade materials that ensure the quality, safety and integrity throughout the shelf life.

NOTE 1. Packaging materials may be required to meet different regulations in Ethiopia.

9.2 Labelling

The labeling shall comply with the requirements of CES 73, and shall be legibly and indelibly marked with the following:

- a) Name of the product;
- b) If spiced the product shall be labelled "Spiced potato crisps";
- c) Name and physical and postal address of manufacturer, exporter/importer;
- d) Batch or identification code;
- e) Net weight in Kgs;
- f) Expiry date;
- g) List of ingredients;
- h) Storage instruction;
- i) Country of origin;
- j) Date of manufacture;
- k) Instructions on disposal of used package;
- l) salted or unsalted
- m) declaration of flavouring agent or spice used
- n) Any other information required by the purchaser.

10 Methods of sampling

Sampling of dehydrated vegetables shall be done in accordance with ES 2834.

Annex A (normative)

Determination of moisture content

Procedure

Weigh accurately 10 g of the material in a suitable moisture dish previously dried in an electric oven and weighed. Place the dish in an electric oven maintained at $105\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ for 5 h. Cool the dish in a desiccator and weigh with the lid on. Repeat the process of heating, cooling and weighing at half-hour intervals until the loss in weight between two successive weighings is less than 1 mg.

Record the lowest weight obtained.

Calculation and expression of results

Moisture, percent by mass = _____

$$\frac{(M_1 - M_2) \times 100}{M_1 - M_3}$$

where,

M_1 is the mass, in grams, of the dish and sample before drying; M_2 is the mass, in grams, of the dish and sample after drying; M_3 is the mass, in grams, of the dish only.

Annex B (normative)

Determination of free fatty acids

Apparatus

Soxhlet fat extraction apparatus

Reagents

Petroleum ether, distilling below 65 °C, or ethyl ether

Alcohol potassium hydroxide, 0.1 N (use absolute or alcohol denatured with methanol, [MeOH])

Alcohol-ether mixture, equal volumes of 96 % alcohol and ethyl ether

Phenolphthalein solution, 1 % in alcohol or alcohol denatured with methanol (MeOH) Add 0.3 ml per 100 ml mixture of alcohol-ether and add alcoholic KOH solution to a faint pink.

Procedure

Extract 10.00 g $\pm$ 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.

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.

Calculation

Calculate the acid value from the following formula:

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

where,

V is the volume, in millilitres, of standard potassium hydroxide solution used;
 N is the normality of standard potassium hydroxide solution; and
 M is the mass, in grams, of the material taken for the test.

Bibliography

AOAC 971.27, Determination of chloride, expressed as sodium chloride.

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Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.

Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the International Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

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