
Bulla powder — Specification

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Fruits and Vegetables (TC 13) and published by the Institute of Ethiopian Standards (IES).

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

Information has been gathered from various relevant resources in developing it.

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

EPHI Data, Composition of Foods Commonly used in Ethiopia.

Acknowledgement is made for the use of information from the above publication.

Bulla powder — Specification

1. Scope

This Ethiopian Standard specifies the requirements for Bulla powder which is obtained from the processing of Enset (*Ensete ventricosum*) and shall be subjected to further processing before consumption.

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 73, General standard for prepackaged foods - Labeling.

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

ES ISO 712, Cereals and cereal products - Determination of moisture content - Reference method

ES ISO 874, Fresh fruits and vegetables - Sampling.

ES 929, Code of practice for hygiene in the food and drink manufacturing industry

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

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 5498, Agricultural food products - Determination of crude fiber content - General method

ES ISO 6492, Animal feeding stuffs – Determination of fat content

ES ISO 6579-1, Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of salmonella Part 1: Detection of *salmonella* spp.

ES ISO 6579-2, Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of salmonella Part 2: Enumeration by a miniaturized most probable number 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 6633, Fruits, vegetables and derived products - Determination of lead content - Flameless atomic absorption spectrometric method.

ES 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.

ES 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.

ES ISO 6888-3, Microbiology of the food chain — Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) —Part 3: Detection and MPN technique for low numbers.

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 10520, Native starch - Determination of starch content - Ewers polarimetric method

ES ISO 11212-4, Starch and derived products- Determination of Cadmium content by atomic absorption spectrometry with electrothermal atomization

ES ISO 16050, Food stuffs - Determination of aflatoxin B1 and total content of aflatoxin B1, B2, G1 and G2 in cereals, nuts, and derived products - High performance liquid chromatographic method.

ES ISO 17239, Fruits, vegetables and derived products - Determination of arsenic content - Method using hydride generation atomic absorption spectrometry.

ES ISO 20483, Cereals and pulses - Determination of the nitrogen content and calculation of the crude protein content – Kjeldah method.

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.

ES ISO 27085, Determination of calcium, sodium, phosphorus, magnesium, potassium, iron, zinc, copper, manganese, cobalt, molybdenum, arsenic, lead and cadmium by ICP-AES.

3. Terms and Definitions

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

3.1

enset plant

enset (*Ensete ventricosum*) is herbaceous perennial plant belongs to the family musaceae and also known as false banana. Is also named as “Warqe” in various areas of Ethiopia.

3.2

bullu powder

a starchy powder which is obtained through dehydration of the water insoluble sediment of unfermented processed (pulverized) pseudostem and/or corm of matured enset plant.

3.3

food grade material

one that will not transfer non-food chemicals into the food and contains no chemicals which would be hazardous to human health.

3.4

foreign matter

all organic and inorganic materials (such as sand, soil, glass).

3.5

practically free

product without defects in excess of those that can be expected to result from, and be consistent with good cultural and handling practices employed in the production and marketing of Bullu powder.

4. Product description

a starchy powder which is obtained through dehydration of the water insoluble sediment of unfermented processed (pulverized) pseudostem and/or corm of matured enset plant. Bullu powder is separated from kocho during processing by squeezing and decanting the liquid. After decanting, the Bullu powder is left to dry and that can be stored for extended periods of time.

5. Raw material

Bullu powder shall be produced from Enset which is fresh, matured, free from insects damage and mould spoilage.

6. Requirement

6.1 General Requirement

Bulla powder shall be free from:

6.1.1 filth in amounts that may represent a hazard to human health;

6.1.2 abnormal color, flavors, odours;

6.1.3 any foreign matter;

6.2 Specific Requirement

Bulla powder shall conform to the compositional requirements listed under Table 1 below.

Table 1 Compositional requirement for Bulla powder

| Characteristics | Requirement | Method of test |
|--|-------------|----------------|
| Total ash content, % by mass on dry basis, Max. | 1.6 | ES ISO 2171 |
| Crude protein content (N x 6.25), % by mass on dry basis, Min. | 0.4 | ES ISO 20483 |
| Crude fat content, % by mass on dry basis, Max. | 0.4 | ES ISO 6492 |
| Moisture content, % by mass, Max. | 9.0 | ES ISO 712 |
| Crude fiber content, % by mass on dry basis, Max. | 2.4 | ES ISO 5498 |
| Total carbohydrate, % on dry basis, Min. | 88.0 | ES ISO 10520 |
| Calcium (Ca) mg/100g on dry basis, Min. | 44.0 | ES ISO 27085 |
| Potassium (K), mg/100g on dry basis, Min. | 70.0 | |
| Iron (Fe), mg/100g on dry basis, Min. | 2.5 | |

7. Contaminants

7.1 Pesticide residues

Bulla powder shall comply with those maximum residue limits established by the Codex General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193).

7.2 Heavy metals

Bulla powder shall be free from heavy metals in amounts which may present a hazard to health. If present, they shall not exceed the limits specified in Table 2 below.

Table 2 Heavy metals

| Characteristics | Limit (mg/kg) Max. | Test Methods |
|-----------------|--------------------|----------------|
| Arsenic (As) | 0.1 | ES ISO 17239 |
| Lead (Pb) | 0.1 | ES ISO 6633 |
| Cadmium (Cd) | 0.1 | ES ISO 11212-4 |

7.3 Mycotoxins

Bulla powder shall comply with those maximum mycotoxin limits established by the Codex General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193). In particular total aflatoxins in Bulla powder shall not exceed 10 µg/kg and 5µg/kg for aflatoxin B1 when tested in accordance with ES ISO 16050.

8. Hygiene

8.1 Bulla powder shall be manufactured and handled in a hygienic manner in accordance with ES 577, ES 929 and ES ISO22002-1.

8.2 The product shall be free from pathogenic micro - organisms and shall comply with microbiological limits in Table 3 below.

Table 3 Microbiological limits for Bulla powder

| Characteristics | Limit | Test Methods |
|---|-----------------|---|
| Total plate count, cfu/g, Max | 10 ⁵ | ES ISO 4833-1 |
| Yeast and mould, CFU/g, Max. | 10 ⁴ | ES ISO 21527-1 ES ISO 21527-2 |
| <i>Staphylococcus aureus</i> cfu/g, Max | Absent | ES ISO 6888-1 ES ISO 6888-2 ES ISO 6888-3 |
| <i>Escherichia.Coli</i> , per g | Absent | ES ISO 7251 |
| Salmonella in 25g | Absent | ES ISO 6579-1 ES ISO 6579-2 ES ISO 6579-3 |

9. Packaging and Labelling

9.1 Packaging

- 9.1.1** Bulla powder shall be packaged in food grade materials that will safeguard the hygienic, physical nutritional and organoleptic qualities of the product.
- 9.1.2** Bulla powder shall be packed with clean, sound and free from insects and fungi infection and the packing material shall be of food grade quality.
- 9.1.3** The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odor or flavor to the product.

9.2 Labelling

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

- a) Name of the product -“ (Bulla powder)”;
- b) Name and physical and postal address of manufacturer;
- c) Net weight;
- d) Nutritional information;
- e) Storage condition; and
- f) Country of origin.

10. Sampling Method

Sampling of Bulla powder shall be done in accordance with ES ISO 2433.

Organization and Objectives

The Institute of Ethiopian Standards (IES) is the national standards body of Ethiopia. IES is re-named by the proclamation number 1263/2021, from Ethiopian Standards Agency (ESA) to Institute of Ethiopian standards, with the mandate given by the regulation Number, 193/2010 and proclamation number, 1263/2021.

IES's objectives are:

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and service 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.
- ❖ Conduct standards related research and provide training and technical support.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational and research institutes, governmental 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.

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