
**Mangos puree (pulp) & concentrate mango
puree – 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 up raising competitiveness and maintain comparative market advantage both domestically and internationally.

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

Commercial production of mango concentrate: A review; International Journal of Multidisciplinary Research and Development, Volume 3; Issue 10; October 2016; Page No. 40-43

Physico chemical characterization and the effect of processing on the quality characteristics of Sindura, Mallika and Totapuri mango cultivars: J Food SciTechnol (February 2015) 52(2):1047–1053 DOI 10.1007/s13197-013-1041-8

Jam development from selected varieties of mango: by Nega Endayehu; school of chemical and bio engineering process engineering graduate program (October, 2016, Addis Ababa, Ethiopia)

Codex Stan 192, *General standard for food additives*.

Codex Stan 193, *Codex general standard for contaminants and toxins in food*.

Codex Stan 297, *Standard for Certain Canned Vegetables*.

AOAC Official Method 986.13 Quinic, Malic, and Citric Acids in Cranberry Juice Cocktail and Apple Juice.

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

Mangos puree (pulp) and concentrate mango puree - Specification

1. Scope

This Ethiopian Standard specifies requirements for mangos puree (pulp) and concentrate mango puree and which are offered for direct consumption or further processing, including for catering purposes or for repackaging if required.

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 58, *Potable water – Specification.*

CES 73, *packaging and labeling.*

CES194, *Mango – specification.*

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

ES ISO 762, *Fruit and vegetable products — Determination of mineral impurities content.*

ES 929, *Code of practice-food hygiene management.*

ES ISO 1842, *Fruit and vegetable products - Determination of pH.*

ES ISO 2172, *Fruit juice - Determination of soluble solids content - Pyknometric method.*

ES ISO 2173, *Fruit and vegetable products - Determination of soluble solids - Refractometric method.*

ES ISO 2447, *Fruits, vegetables and derived products - Determination of tin content.*

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

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 6561-2, *Fruits, vegetables and derived products - Determination of cadmium content - Part 2: Method using flame atomic absorption spectrometry.*

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 6637, *Fruits, vegetables and derived products - Determination of mercury content - Flameless atomic absorption method.*

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

ES ISO 21527-1, *Microbiology of the food chain - Horizontal method for the determination of Vibrio spp. - Part 1: Detection of potentially enteropathogenic Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus.*

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. Terms and definitions

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

3.1

mango puree (pulp)

is unfermented but fermentable product prepared from fresh mango fruit (*Mangifera indica* L.) obtained or extruded by sieving, grinding, screening or milling the edible part of the whole or peeled fruit without removing any juice.

3.2

concentrate mango puree

mango concentrate (for use in the manufacture of Fruit Juices and Nectars) is obtained by the physical removal of water from the mango puree in an amount sufficient to increase the Brix level (sugar-to-water mass ratio of a liquid) to a value at least 50% greater than the Brix value established for reconstituted juice from the same fruit.

3.3

sound

produce not affected by rotting or deterioration which makes it unfit for consumption.

3.4

food grade packaging material

packaging material, made of substances which are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odor or flavor to the product.

3.5

foreign matter

mango purée/ concentrate mango puree shall be clean, sound, wholesome, and free from evidence of foreign material such as dirt, silt, sand, thorns, insect parts, hair, wood, glass, and metal.

3.6

brix

percent of soluble solids content of a liquid as determined by a refractometer calibrated at 20 °C and read as degrees Brix' on the International Sucrose Scale.

4. Ingredients

Combination of two or more of the following ingredients may be used in the puree:

- a) Mango complying to CES 194;
- b) water complying with CES 58;
- c) Food additives conforming to Codex Stan 192.

5. Requirements

5.1 General requirements

5.1.1 The mango puree/concentrate shall:

- a) be free from insect or their fragments, or fungal growth;
- b) have the characteristic taste and flavor of mango ;
- c) be free from burnt or any other objectionable flavors;
- d) be of good keeping quality and shall show no sign of fermentation;
- e) possess good body and consistency, and uniform color;
- f) be free from any extraneous plant material and foreign matter.

5.1.2 Where puree is packed in metal cans, the mineral impurity content shall not exceed 0.1 % of the natural total soluble solids content when tested in accordance with ES ISO 762.

5.2 Specific requirements

Mango puree and mango concentrated puree shall comply the following composition requirements indicated in Table 1 below.

Table 1 - Compositional requirements for mango puree and mango concentrate puree

S/N	Characteristics	Requirement		Test methods
		Mango Puree	Mango concentrate puree	
1	pH	3.7 - 4.3	3.5 - 4.4	ES ISO 1842
2	°Brix, Min.	16	28	ES ISO 2172, ES ISO 2173
3	acidity, % as citric acid	0.3 - 0.9	0.4 - 1.6	AOAC 986.13
4	Consistency	7 - 14	Max. 10	
5	Color	Light to golden yellow	Golden yellow	Visual

6. Contaminants

6.1 Pesticides residues

The products covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

6.2 Other contaminants

Puree shall conform to the maximum levels of the Codex General Standard contaminants and toxins in food and feed (Codex Stan 193).

Table 2 – Heavy metal contaminants limits for mango puree and mango concentrate puree

Contaminants	Limit (mg/kg, max.)	Test Methods
Arsenic (as As)	0.2	ES ISO 17239
Lead (as Pb)	0.3	ES ISO 6633
Tin (as Sn)	250	ES ISO 2447
Mercury (as Hg)	0.01	ES ISO 6637
Cadmium (as Cd)	0.05	ES ISO 6561-2

7. Hygiene

7.1 The product shall be manufactured and handled in a hygienic manner in accordance with ES 577, ES 929 and ES ISO 22002-1.

7.2 The product shall be free of pathogenic microorganisms and shall conform to the microbiological requirements in Table 3.

Table 3 - Microbiological limits for mango puree and mango concentrate puree

Characteristic	Limits	Test methods
Total plate count, cfu/g, Max.	10	ES ISO 4833-1
Yeast/moulds, cfu/g, Max.	10	ES ISO 21527-1 ES ISO 21527-2
<i>Escherichia coli</i> , cfu/g	absent	ES ISO 7251
<i>Salmonella</i> sp., cfu/25g	absent	ES ISO 6579-3

8. Packaging and Labeling

8.1 Packaging

8.1.1 Shall be clean, sound, free from insects and fungi infection and the packing material shall be of food grade quality.

8.1.2 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.

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

8.2 Labeling

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) Name and physical and postal address of manufacturer, exporter/importer;
- c) Batch or identification code;
- d) Net weight in liter;
- e) Expiry date;
- f) List of ingredients;
- g) Storage instruction;
- h) Country of origin;
- i) Date of manufacture;
- j) Any other information required by the purchaser.

9. Method of sampling

Sampling of mango puree and mango concentrate puree shall be done in accordance with ES 2834.

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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.

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International Involvement

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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