ETHIOPIAN STANDARD

ES 7238:2025

First edition
xx-xx-2025

Dried pineapple — Specification

ICS: 67.080.20

Published by Institute of Ethiopian Standards

Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Commitee for Fruits and vegetables(Tc-13) and published by the Institute of Ethiopian Standards (IES).

In preparing this Ethiopian Standard reference have been made to the following:

Acknowledgements are made for the use of information from the above publication.

Dried pineapple — Specification

1. Scope

This Ethiopian Standard specifies requirements and methods of sampling and test for dried pineapple from *Ananas comosus* (L.) Merr., of the Bromeliaceae family and their hybrids 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 standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AOAC 999.11, Determination of lead, iron, copper and zinc in food

EAS 38, General standard for labeling of prepackaged foods

EAS 39,Code of practice for hygiene in the food and drink manufacturing industry

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

ISO 6888-1, Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coagulase-positive staphylococci(Staphylococcusaureus and other species) --Part1:Technique using Baird-Parker agar medium

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

ISO 6636-2, Fruits, vegetables and derived products -- Determination of zinc content -- Part 2: Atomic absorption spectrometric method

ISO 6634, Fruits, vegetables and derived products -- Determination of arsenic content -- Silver diethyldithio carbamate spectrophotometric method

ISO 21872, Microbiology of the food chain — Horizontal method for the detection of potentially enteropathogenic Vibrio parahaemolyticus, Vibrio cholerae and Vibrio vulnificus

ISO 7952, Fruits, vegetables and derived products -- Determination of copper content -- Method using flame atomic absorption spectrometry

ISO 2447,Fruit and vegetable products—Determination of tin

3. Terms and Definitions

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

3.1
dried pineapple
prepared from sound fruit of varieties characteristics of pineapple fruit and processed by drying either by sun or by other recognized methods of dehydration, which may be preceded by sulphuring, with or without added sweetening agent and food additives, into a form of marketable dried product.

4. Presentation Style

Dried pineapple may be presented in the following styles.

a) Sliced; varying lengths and thickness.

b) Diced into chunks and/or cubes.

c) Chips and strips of irregular shapes; and

d) Pieces or powdered. When in powder form, it shall be free flowing and free from agglomerates.

5. Requirement

5.1 General Requirements

a) intact (only for whole slices); however, edges that are slightly torn, slight superficial damage and slight scratches are not considered as a defect.

b) sound; produce affected by rotting or deterioration such as to make it unfit for human consumption is excluded

c) clean, practically free of any visible foreign matter.

d) sufficiently developed

e) free from living pests whatever their stage of development

f) free from damage caused by pests, including the presence of dead insects and/or mites, their debris or excreta

g) free from blemishes, areas of discoloration or spread stains in pronounced contrast with the rest of the produce affecting in aggregate more than 20 per cent of the surface of the produce.

h) free from mould filaments visible to the naked eye

i) free of fermentation

j) free of abnormal external moisture

k) free of foreign smell and/or taste except for a slight salty taste of sodium chloride and or calcium chloride and a slight smell of preservatives/additives, including sulphur dioxide.

5.2 Classification

Dried pineapples are classified into three classes (Extra Class, Class I, Class II) as follows:

Table 1: Classes of Dried Pineapple

Defects allowed	Tolerances allowed, percentage of defective produce, by number or weight			**Test Methods**
	Extra	Class I	Class II	
(a) Tolerances for produce not satisfying the minimum requirements	10	15	20	Annex A
of which no more than:				
Damage caused by heat during drying affecting the taste	5	8	10	
Mouldy	0	0.5	1.0	
Fermentation	0.5	1	2	
Rotting	0	0.5	1	
Pest damage	2	2	6	
Living pests	0	0	0	
(b) Size tolerances (if sized)				
For produce not conforming to the size indicated, in total	10	10	10	
Presence of other styles among that indicated (by weight)	2	7	13	
(c) Tolerances for other defects				
Foreign matter of organic origin such as core and skin fragments (pieces per kilo)	1	2	3	
Foreign matter of mineral origin (by weight)	0.025	0.025	0.025	

5.3 Specific Requirement

Dried pineapple shall conform to the compositional requirement in Table 2 below.

Table 2 Compositional requirement of dried pineapple

S. No	Characteristics	Requirement	Test Methods
1	Moisture content, % Max. for non-chemically preserved dried pineapple	20	Annex B
2	Dried pineapples chemically preserved (m/m), % Max.	44	
3	Acid insoluble ash content, % (m/m)	0.1	ES ISO 763
4	Water activity, aw, Max.	0.70	ES ISO 18787

6. Food additives and processing aids

6.1 Additives like sweeteners, colorants and preservatives used shall be in accordance to the General Standard for Food Additives (Codex Stan 192:1995).

6.2 Flavourings used in dried pineapple shall comply with the Guidelines for the Use of Flavourings (CAC/GL 66:2000).

7. Contaminants

7.1 Pesticide residues

Dried pineapples shall conform to the pesticide residue limits prescribed by the Codex Alimentarius Commission of the respective commodity.

7.2 Mycotoxin

The maximum content of aflatoxins in dried pineapple when determined in accordance with the method described in ES ISO 16050 shall not exceed 10 ppb for total aflatoxins and 5 ppb for aflatoxin B1.

7.3 Metal contaminants

Dried pineapples shall not contain metal contaminants in excess of the quantities specified in Table 3 below.

Table 3 Metal Contaminants

S.No	Characteristics	Maximum (mg/kg)	Test Methods
1	*Arsenic (as As)*	0.02	ES ISO 6634
2	*Lead (as Pb)*	0.6	ES ISO 6633
3	Tin (Sn)	250	ES ISO 2447
4	Mercury (Hg)	0.01	ES ISO 6637
5	Cadmium (Cd)	0.05	ES ISO 6561-2
6	*Zinc (as Zn)*	1.5	ES ISO6636-2
7	*Copper (as Cu)*	1.5	ES ISO 7952

8. Hygiene

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

8.2 Died pineapple shall be free of pathogenic microorganisms and shall conform to the microbiological requirements in Table 4 below.

Table 4 Microbiological Limits

S.NO	Microorganism	Limit	Test Methods
1	Total plate count,(cfu/g), Max.	2×10^4	ES ISO 4833-1
2	*Coli form,* (cfu/g), Max.	10^2	ES ISO 4832
3	Yeasts and moulds, (cfu/g), Max.	10^2	ES ISO 21527-1 ES ISO 21527-1
4	*Salmonella spp*, cfu/25g	Absent	ES ISO 6579
5	*Staphylococcus aureus*, cfu/g, Max.	Absent	ES ISO 6888-1 ES ISO 6888-2 ES ISO 6888-3
6	E. coli cfu/g	Absent	ES ISO 7251

9. Packaging and Labelling

9.1 Packaging

9.1.1 Dried pineapple shall be packed in clean, sound, free from insects and fungi infection and the packing material shall be of food grade quality.

9.1.2 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.

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 including its presentation style. Example as **"Sliced Dried Pineapple" …**;
b) Name and physical address of the manufacturer;
c) Declaration of preservative by common name or international numbering; if any
d) Batch/Lot number;
e) Net content (mass) in SI unit;
f) Class of the product;
g) Country of origin;
h) Date of packing/manufacture (dd/mm/yy);
i) Expiry date (dd/mm/yy);
j) Instruction for use
k) Storage condition.

10. Sampling Method

Sampling shall be carried out in accordance with Annex C

Annex A
(Normative)

Determination of the content of pest-infested and spoiled dried pineapple, immature fruits, extraneous matter and deviations from main colour.

A.1 Principle

Visual inspection of a test portion of dried pineapples. Physical separation of the damaged pieces, immature fruits and extraneous matter from the sound, healthy and ripe pieces of the sample.

A.2 Procedure

Weigh to the nearest 0.02g, a test portion of about 599 g. Separate carefully, by hand or using tweezers the pest-infested and spoiled dried pineapple, immature fruits, extraneous matter and the dried pineapple which show deviations from the main colour.

Weigh to the nearest 0.02 g, each of the categories separately.

A.3 Expression of results

The proportion, p, expressed as a percentage by mass, of each category separately is equal to;

$$P = \frac{m1 \times 100}{M0}$$

Where:

M0 is the mass, in grams, of the test portion

M1 is the mass, in grams of the relevant category (see A-2)

A.4 Test Report

The test report shall specify;

a) All information necessary for the complete identification of the sample;

b) The sampling method used, if known;

c) The test method used, with reference to this East Africa Standard;

All operating details not specified in this East Africa Standard; or regard as optional, together with details of any incidents which may have influenced the test result(s);

e) The test result(s) obtained, or, if the repeatability has been checked, the final quoted result obtained

Annex B
(Normative)
Determination of moisture content

B.1 Principle

Heating and drying of test portion of dried pineapple at a temperature of 70 ^{0}C $\pm$ 1 ^{0}C under pressure not exceeding 13 kPa (100 mmHg).

B.2 Materials

Use only materials of recognized analytical grade and distilled or dematerialized water or water of equivalent purity.

B.2.1 Sand

B.3 Apparatus

Usual laboratory apparatus and, in particular the following:

B.3.1 Electrical oven, capable of being maintained at 70 ^{0}C $\pm$ 1 ^{0}C at a pressure of 13 kPa (100Hg).

B.3.2 Dish, of corrosion-resistant metal, of diameter about 8.5 cm, with tight-fitting lid.

B.3.3 Fruit chopper made of a material, which does not absorb moisture.

B.3.4 Desiccators, containing an effective desiccant

B.3.5 Steam bath

B.3.6 Balance, capable of weighing to the nearest 0.01 g.

B.4 Preparation of test sample

Take approximately 50.0g dried pineapple and pass it through the fruit chopper (A.3.3) three times, mixing thoroughly after each grinding. Keep it in a completely filled, airtight, closed container to prevent absorption of water.

B.5 Procedure

B.5.1 Preparation of dish and lid

Add about 2 g of sand (A.2.1) to the dish (A.3.2) and dry, with the lid for 2h in the oven (A.3.1) set at 70 ^{0}C. Leave to cool to room temperature in the desiccators (A.3.4) and weigh sample to the nearest 0.01 g. Repeat the same drying procedure until a constant weight is achieved.

B.5.2 Test Portion

Weigh, to the nearest 0.02 g, about 5 g of the test sample (A.4) and spread this test portion as evenly as possible over the bottom of the dish (A.3.2) containing the sand (A.2.1).

A.5.3 Determination

Moisten the test portion and sand (B.5.2) thoroughly with a few milliliters of hot water. Mix the test portion sand with a spatula. Wash the sample residue on the spatula in to the dish with the minimum volume of hot water, Heat the open dish on the steam bath (A.3.5) to evaporate the water to dryness. Then put the dish, with the lid alongside, in the electric oven (A.3.1) set at 70 ^{0}C and continue drying for 6 hrs under a pressure not exceeding 13 kPa (100 mmHg). Do not open the electric oven during this period. During drying admit to the oven a slow current of air (about 2 bubbles per second) dried by passing through sulfuric acid. The metal dish shall be placed in direct contact with the metal shelf of oven. After drying, remove the dish, cover it immediately with its lid and place it in the desiccators (A.3.4). After cooling to room temperature, weigh it, still covered to the nearest 0.02 g.

B.6 Calculation

The moisture content, m, expressed as a percentage by mass, of the test portion is equal to;

$$\mathrm{m} = \frac{m1+m2}{m1-m0} x\ 100$$

Where:

mo is the mass, in grams, of the dish with its lid and the sand;

m1 is the mass, in grams, of the dish with its lid and the sand with the test portion before moistening and oven

drying;

m2 is the mass, in grams, of the dish with its lid and the sand with the test portion after oven drying. Give the

result to one decimal place.

B.7 Repeatability

The absolute difference between two independent single test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time, should not be grater then 0.2 g of water per 100 g of sample.

NOTE: If it is required to check whether the repeatability requirement is met, carry out two single determinations in accordance with A.5.1 to A.5.3 under repeatability conditions.

B.8 Test report

The test report shall specify;

B.8.1 All information necessary for the complete identification of the sample;

B.8.2 The test method used, with reference to this Standard.

B.8.3 All operating details not specified in this Standard or regarded as optional together with details of any incidents which may have influenced the test result(s).

B.8.4 The test result(s) obtained, or, if the repeatability has been checked, the final quoted result obtained.

Annex C
(Normative)
Sampling

C.1 Definitions

C.1.1

lot

collection of primary containers or units of the same size, type, and style manufactured or packed under similar conditions and handled as a single unit of trade

C.1.2

lot size

number of primary containers or units in the lot

C.1.3

sample size

total number of sample units drawn for examination from a lot

C.1.4

Sample unit

container, a portion of the contents of a container, or a composite mixture of product from small containers that is sufficient for the examination or testing as a single unit. For fill of container, the sample unit shall be the entire contents of the container

Sampling plans

Lot size (primary containers)	**Size of container, *n*[1]**
Net weight equal to or less than 1 kg (2.2 lb)	
4800 or less	13
4801 to 24000	21
24001 to 48000	29
48001 to 84000	48
84001 to 144000	84
144001 to 240000	126
Over240000	200
Net weight greater than 1 kg (2.2 lb) but not more than 4.5 kg (10 lb)	
2400 or less	13
2401 to 15000	21
15001 to 24000	29
24001 to 42000	48
42001 to 72,000	84
72001 to 120000	126
Over 120000	200
Net weight greater than 4.5 kg (10 lb)	
600 or less	13
601 to 2000	21
2001 to 7200	29
7201 to 15000	48
15001 to 24000	84
24001 to 42000	126
Over 42000	200
[1] *n* = number of primary containers in sample.	

የኢትዮጵያ የደረጃዎች ኢንስቲትዩት
INSTITUTE OF ETHIOPIAN STANDARDS

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.

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 from our website.

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

For More Information?

Contact us at the following address.

The Head Office of IES is at Addis Ababa.

☎***011-6460685, 011-6460565***
011-6460880
✉***2310AddisAbaba, Ethiopia***
E-mail:info@ethiostandards.org
Website:www.ethiostandards.org

Standard Mark