KENYA STANDARD

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ICS 67.080.10

Dried fruits -Specification

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TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

Jomo Kenyatta University of Agriculture and Technology- Department of Food Science and Technology
Victoria Juice Co ltd
Kevian Kenya Ltd
Government chemist
Consumer Information Network
Premier Foods Ltd.
Pest control products board
Kenya Industrial Research and Development Institute
Ministry of Health- Food Safety Unit
Ministry of Agriculture, Livestock and Fisheries
Kenya plant health inspectorate services
National Public Health Laboratory services
Coca-Cola East Africa Ltd
Del Monte Kenya Ltd
Agri Pro-pak Ltd
Egerton University
Horticultural Crops Directorate
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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Dried Fruits- Specification

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P R E F A C E

This Kenya Standard was developed by the Technical Committee on Processed Fruits and Vegetables under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

This standard applies to dried fruits that have been dried by natural or artificial means or a combination of both. The fruits are dried to the extent that the greater part of the moisture has been removed, and in addition the fruit may be subjected to a safe and appropriate treatment in preparation and packing, to permit marketing in normal trade channel.

This standard stipulates the essential compositional, quality, microbiological, contaminants and labelling requirements for dried fruits.

In the preparation of this standard useful information was derived from members of the technical committee, and local manufacturers

KENYA STANDARD

DRIED FRUITS - SPECIFICATIONS

1. SCOPE

This Kenya Standard specifies requirements and methods of test and sampling for dried fruits, as defined in Section 3 below and which are offered for direct consumption or further processing, including for catering purposes or for repackaging if required.

2. Normative References

KS EAS 38, General standard for labeling of prepackaged foods
KS EAS 39, Code of practice for hygiene in the food and drink manufacturing industry
KS EAS 12, *Drinking (Potable) water- Specification*
KS EAS 803: 2013. Nutrition labeling – Requirements
KS EAS 804:2013 Claims on foods – Requirements
KS EAS 805: 2013 Use of Nutrition and health claims
KS CAC RCP 3; recommended international code of hygienic practice for dried fruits
KS Codex Stan 192, General Standard for Food Additives
KS Codex Stan 193, General Standard for contaminants
KS 38, *Plantation (mill) white sugar — Specification*
KS EAS 36, Specification for honey
KS EAS 5, *Refined white sugar — Specification*
KS ISO 763; Fruit and vegetable products -- Determination of ash insoluble in hydrochloric acid
KS ISO 2447, Fruit and vegetable products — Determination of tin content
KS ISO 4833; Microbiology of the food chain -- Horizontal method for the enumeration of microorganisms -- Part 1: Colony count at 30° C by the pour plate technique
KS ISO 3094, Fruit and vegetable products — Determination of copper content — Photometric method
KS ISO 4125, Dry fruits and dried fruits — Definitions and nomenclature
KS ISO 6633, Fruit and vegetable products — Determination of lead content — Flameless atomic absorption spectrometric method
KS ISO 6634, Fruit and vegetable products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method
KS ISO 6636-3, Fruit and vegetable products — Determination of zinc content — Dithizone spectrometric method
KS ISO 6637, Fruit and vegetable products — Determination of mercury content — Flameless atomic absorption method
KS ISO 7251, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique
KS 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

3. Terms and definitions

For the purposes of this standard, the terms and definitions given in KS ISO 4125 shall apply.

3.1. Product definition

3.1.1 Dried fruits are the products:

a) Prepared from edible parts of suitable varieties of named sound fruit, free from blemishes, insect or fungal infection, of appropriate maturity, from which, moisture has been removed, under controlled conditions of temperature, humidity and airflow, to the extent that the product is preserved.
b) It may be whole, sliced, cubed/diced, chunks, chips, trips, bulbs/balls, crisps, flakes, quarters, pieces or powdered. When in powder form, it shall be free flowing and free from agglomerates. other presentation such as leathers, rolls or sheets of the product may be used provided that the product:

(i) is sufficiently distinctive from other forms of presentation laid down in this standard;

(ii) meets all relevant requirements of this standard; and,

(iii) is adequately described on the label to avoid confusing or misleading the consumer

c) The product may contain permitted food additives

d) Dry fruits can be certain nuts or kernels, drupes, legumes, capsules and/or follicles

5. Composition

5. Basic Ingredients

Fruits as defined in clause 3

Examples of the commonly dried fruits are but not limited to those listed in Annex **A**

5.2 Optional ingredients

These include other edible material as may be appropriate to stuffing the product provided it is suitable for consumption.

5.3 General quality requirements

5.3.1 Colour, odour and flavour

Dried fruits shall have characteristic colour, flavour and odour of dried fruits, corresponding to the type and variety of the named fruit and shall possess and maintain the product's essential texture, physical, chemical, organoleptic, and nutritional characteristics of the fruit(s).

5.3.2 Moulds, insects etc.

The finished product shall be free from living insects, mites or other parasites and moulds, and shall be practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal Vision) or with such magnification as may be necessary in any particular case. If the magnification exceeds x 10, this fact shall be stated in the test report.

5.3.3 Extraneous matter

Dried fruits shall be practically free from extraneous matter including soil, dirt, twigs, bits of wood and loose stalks, peel(where applicable) , stems, calyx, peduncle and leaves or any other foreign matter

5.4 Chemical requirements

Dried fruits shall also conform to the requirements given in Table 1.

Table 1 — Requirement for dried tropical fruits

Characteristic	Requirement	Method of test
Moisture, % (m/m), max	20	Annex B
Acid insoluble ash, % (m/m), (on dry basis), max.	0.1	KS ISO 763
Water activity a_w	**0.7%**	-

On-chemically preserved dried mangoes shall have a moisture content that does not exceed 10 per cent (m/m).

Non-chemically preserved dried mangoes shall have a moisture content that does not exceed 10 per cent (m/m).

5.5 Sulfur dioxide content

The content of residual Sulfur dioxide shall not exceed 2 000 mg/kg.

6. FOOD ADDITIVES

Colours, Carbohydrate sweeteners, preservatives and nutritive carbohydrates used shall be in accordance to the *General Standard for Food Additives* (CODEX STAN 192-1995)

Flavourings used in dried fruits should comply with the Guidelines for the Use of Flavourings (KS CAC/GL 66-200

7. Contaminants

The products covered by this Standard shall comply with the maximum levels of the General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995).

7.1 Pesticide residues

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

7.2 Heavy Metal Contaminants

The products covered by the provisions of this standard shall conform to those maximum limits for Heavy metals contaminants established by the Codex Alimentarius Commission for these products in table 5 below

TABLE 5- Heavy metals maximum limits for Dried fruits

CONTAMINANTS	MAXIMUM LEVEL	Method of Test
Arsenic (As)	0.2 mg/kg	KS ISO 17239
Lead (Pb)	1.0 mg/kg	KS ISO 6733
Tin (Sn)	250 mg/kg	KS ISO 2447
Mercury (Hg)	0.01 mg/kg	KS ISO 6637
Cadmium (cd)	0.05 mg/kg	KS ISO 6732

7.3 Other contaminants

The products covered by the provisions of this standard shall conform to those maximum levels for contaminants established by the Codex Alimentarius Commission for these products

8. Hygiene

8.1 It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the recommended international code of hygienic practice for dried fruits (KS CAC RCP 3:1969) and other relevant codes of hygienic practice and codes of practice.

8.2 The products shall conform to microbiological criteria in Table 6 and those provided in KS 2455; Food Safety -general standard

Table 6 - Microbiological limits for dried fruits

SL No.	Microorganism	Limit	Method of Test
i.	Total viable count, cfu/g, max	2×10^4	KS ISO 4833
ii.	Escherichia coli, (cfu/g), max	Absent	KS ISO 7251
iii.	Staphylococcus aureas, (cfu/25g)	Absent	KS ISO 6888-1
iv.	Shigella, cfu/25g	Absent	KS ISO4833
v.	Salmonella. Cfu/25g	Absent	KS ISO 6579
vi.	Coliforms cfu/g	100	KS ISO 4833
vii.	Vibrio cholera, cfu/25g	Absent	KS ISO 4833
viii.	Yeast and Moulds (cfu/g), max	100	KS ISO 7954

9. Packaging

The products covered by the provisions of this standard shall be packaged in clean food grade packaging material to protect the product from contamination. The packaging materials and process shall not contaminate the product or otherwise affect its technological, nutritional or sensory quality.

10. LABELLING

In addition to the Standard for the Labelling of Pre-packaged Foods (KS EAS 38), the following specific provisions apply:

10.1 The name of the product:

The name of the product as declared on the label shall be (X) Dehydrated fruits or Dried (X) fruits or Dehydrated (X) fruits where X is the name of the dried fruit;

10.2 In the case of mixed dried fruits; List of the names of the various fruit species used in the mix, shall be listed in descending order of the proportions

10.3 List of Ingredients — a complete list of ingredients shall be declared on the label in descending order of proportion.

10.4 Nutrition declaration - Any added essential nutrients declaration should be labelled in accordance with the Guidelines on Nutrition Labelling (KS EAS 803), General Guidelines on Claims (KS EAS 804) and the KS EAS 805; Guidelines for Use of Nutrition and Health Claims

10.5 Net Contents — the net contents shall be declared by volume in metric units (*Systeme Internationale*).

10.6 Name or business name and Address of the manufacturer, packager, distributor, importer, exporter or vendor of the product, whichever may apply, shall be declared.

10.7 Instructions for use and storage shall be declared

10.8 Lot Identification — each container shall be embossed or otherwise permanently marked in code or in clear identity the producing factory and the lot.

10.9 Place/country of origin

10.10 Date of expiry

11. Methods of sampling and test

The products covered by the provisions of this standard shall be tested using appropriate standard methods declared in this standard. Other test may be performed as per the methods given in the latest AOAC/ Codex/ ISO and other internationally recognized methods. Sampling shall be as described in the Standard, in the Annex

ANNEX A

Table 2 - List of the fruits most commonly traded as dry fruits

No.	Botanical name of the plant	Common name of the fruit
	Anacardium occidentale L.	Cashew nut, bean of Malaca
	Amygdalus communis L. syn. Prunus tenela Batsch	Almond
	Arachis hypogaea L.	Peanut, Groundnut
		Brazil nut, Para nut,
	Canarium ovatum Engelm.	Pili nut
	* Canarium commune L.	Java almond, Pili, Pilaway
	+ Carya ilfinoiensis	Shagbark hickory
	(Wangenh.) K. Koch	Souari nut, Butternut
	* Carya a/ba (L.) Nutt.	Chestnut, Sweet chestnut
	* Caryocar nuciferum L.	I-lazelnut, Cob-nut
	Castanea sativa Miller	Oleaster, Russian Olive
	Cera tonia siliqua L .	Java almond, Pili, Pilaway
	Cocos nucifera L.	S hagbark hickory
	Corylus avellana L.	Souari nut, Butternut
	Corylus maxima Miller	Chestnut, Sweet chestnut
	Eiaeagnus angustifolia L.	I-lazelnut, Cob-nut
	Juglans regia L.	walnut
	* L ecythis unsitata L.	Sapucaia nut
	* L ecythis oflaria L.	Sapucaia nut, Monkeypot
	* Lecythis lanciolata Aublet	Macadamia nut,
	* Lecythis ternifolia Mueller	Queensland nut
	Macadamia ternifofia F. M uel ler	Sapucaia nut, Monkeypot
	Pinus pinea L.	Pine nut
	Pistacia Vera L.	Pistachio nut
	Pistacia terebin thus L.	Terebinth berry
	Prunus armeniaca L.	Apricot kernel
	Prunus marhaleb L Syn. Cerasus mahaleb miller	Mahaleb cherry
Botanical names preceded by an asterisk have not yet been stabilized by the international Seed Testing Association (ISTA). The stabilized plant names given are in accordance with /STA List of Stabilized Plant names. 3rd edition. Zurich : The International Seed Testing Association, 1988		

Table 2 - List of the fruits most commonly traded as dried fruits

No.	Botanical name of the plant	Common name of the fruit
	Ribes grossularia L. syn. Ribes uva-crispa L.	Gooseberry
	Ribes nigrum L.	Blackcurrant
	Ribes rubrum L. syn. Ribes silvestre Lam.	Red currant, White currant
	Rubus fruticosus L	Blackberry
	Rubus idaeus L.	Raspberry
	Vaccinium myrtilius L.	Bilberry
	Vitis vinifera L	Grape, Raisinz), Sultana2),

		Currant2)
	Zizyphus jujuba (Lam.) Miller	Jujube, Chinese date
	Zizyphus vulgaris Lam.	Common juju be
		Apples
		Apricots
		Bananas
		Cherries
		Coconuts
		Figs
		Nectarines
		Peaches
		Pears
		Pineapples
		plums
		Dates
		Mangoes
Botanical names preceded by an asterisk have not yet been stabilized by the Inter-national Seed Testing Association (ISTA). The stabilized plant names given are in accordance with /STA List of Stabilized Plant names. 3rd edition. Zurich : The International Seed Testing Association, 1988		

ANNEX B

DETERMINATION OF MOISTURE CONTENT

C1. PRINCIPLE

Heating and drying of a test portion of dried fruit at a temperature of 70 ºC ± 1 ºC under a pressure not exceeding 13 kPa (100 mm Hg).

C2. APPARATUS

Usual laboratory equipment and, in particular, the following:

C2.1 Electric Oven — Capable of being maintained at 70 ºC ± 1 ºC at a pressure of 13 kPa (100 mm/Hg).

C2.2 Dish — Of corrosion-resistant metal, of diameter about 8.5 cm, with tight-fitting lid.

C2.3 Fruit Chopper — Made of a material which does not absorb moisture.

C2.4 Desiccator — Containing an effective desiccant.

C2.5 Steam Bath

C2.6 Sand

C2.7 Analytical Balance — Capable of an accuracy of ± 0.01 g.

C3. PREPARATION OF TEST SAMPLE

Take approximately 50 g of dried mango and pass it through the fruit chopper (**C2.3**) three times, mixing thoroughly after each grinding. Keep it in a completely filled, airtight, closed container to prevent absorption of water.

C4. PROCEDURE

NOTE: If it is required to check whether the repeatability requirement is met, carry out two determinations in accordance with **C4.1** to **C4.3** under repeatability conditions.

C4.1 Preparation of Dish and Lid — Add about 2 g of the sand (**C2.6**) to the dish (**C2.2**) and dry, with the lid, for 2 h in the oven (**C2.1**) set at 70 ºC. Leave to cool to room temperature in the desiccator (**C2.4**) and weigh to the nearest 0.01 g. Repeat the same drying procedure until a constant weight is achieved.

C4.2 Test Portion — Weigh, to the nearest 0.02 g, about 5 g of the test sample (**C3**) and spread this test portion as evenly as possible over the bottom of the dish containing the sand (**C4.1**).

C4.3 Determination — Moisten the portion and the sand thoroughly with a few millilitres of hot water. Mix the test portion and sand with a spatula. Wash the sample residue on the spatula into the dish with the minimum volume of hot water. Heat the open dish on the steam bath (**C2.5**) to evaporate the water to dryness. Then put the dish, with the lid alongside, in the oven (**C2.1**) set at 70 ºC and continue drying for 6 h under a pressure not exceeding 13 kPa (100 mm/Hg). Do not open the oven during this period. During drying, admit to the oven a slow current of air (about 2 bubbles per second) dried by passing through sulphuric acid. The metal dish shall be placed in direct contact with the metal shelf of the oven. After drying, remove the dish, cover it immediately with its lid and place it in the desiccator (**C2.4**). After cooling to room temperature, weigh it, still covered, to the nearest 0.02 g.

C5. Calculation

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

$$\frac{m_1 - m_2}{m_1 - m_o} \times 100$$

where

m_o = the mass, in g, of the dish with its lid and the sand;

m_1 = the mass, in g, of the dish with its lid and the sand with the test portion before moistening and oven-drying;

m_2 = the mass, in g, of the dish with its lid and the sand with the test portion after oven-drying.

Give the result to one decimal place.

C6. 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 greater than 0.2 g of water per 100 g of sample.

C7. TEST REPORT

The test report shall specify

(i) the method in accordance with which sampling was carried out, if known;

(ii) the method used;

(iii) the test result obtained;

(iv) if the repeatability has been checked, the final quoted result obtained.

It shall also mention 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.

The test report shall include all information necessary for the complete identification of the sample.