KENYA STANDARD

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Canned tropical fruit salad — Specification

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Kevian Kenya Ltd
Government chemist
Premier Foods Ltd.
Kenya Industrial Research and Development Institute
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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, are welcome.

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FOREWORD

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

The standard stipulates the essential compositional, quality, microbiological, contaminants and labelling requirements for canned tropical fruit salad as defined in this standard.

In the preparation of this Kenya Standard, reference was made to the following publication:

Codex Standard for canned tropical fruit salad (CXS 99-1981).

Acknowledgement is hereby made for the assistance derived from this source.

SPECIFICATION FOR CANNED TROPICAL FRUIT SALAD

1.1 SCOPE

This Kenya Standard specifies the requirements and methods of sampling and test for canned tropical fruit salad.

1.2. Product Definition

1.2.1 Canned tropical fruit salad is the product:
(a) prepared from a mixture of basic fruits as specified in Section 3.2 (a) to which may be added one or more optional fruits as specified in Section 3.2 (b);
(b) such fruits may be fresh, frozen or canned;
(c) the fruit mixture is packed with water or other suitable liquid packing medium and may be packed with nutritive sweeteners and processed by heat in an appropriate manner before or after being sealed in a container so as to prevent spoilage.

1.3 '**tropical fruit salad**' shall also mean the same as '**tropical fruit cocktail**' and '**tropical fruit mix**'.

2. NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

AOAC 968.30 (Codex general method for processed fruits and vegetables for determination of Drained weight)
AOAC 972.25 (Codex general method for determination of lead)
KS Codex Stan 195, General Standard for Food Additives
KS Codex Stan 193, General Standard for contaminants
KS EAS 38, labeling of prepackaged foods
KS EAS 39, Code of practice for hygiene in the food and drink manufacturing industry
KS EAS 513, Drinking water- Specification
KS EAS 803. Nutrition labeling – Requirements
KS EAS 804, Claims on foods – Requirements
KS EAS 805, Use of Nutrition and health claims
KS ISO 2173, Fruit and vegetable products - Determination of soluble solids - Refractometric method
KS ISO 4833-1; Microbiology of the food chain -- Horizontal method for the enumeration of microorganisms- Part 1: Colony count at 30 degrees C by the pour plate technique
KS ISO 6633; Fruits, vegetables and derived products - Determination of lead content - Flameless atomic absorption spectrometric 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 17240; Fruit and vegetable products -- Determination of tin content -- Method using flame atomic absorption spectrometric
ISO/TS 17919; Microbiology of the food chain -- Polymerase chain reaction (PCR) for the detection of food-borne pathogens -- Detection of botulinum type A, B, E and F neurotoxin-producing clostridia
ISO 7932; Microbiology of food and animal feeding stuffs-- Horizontal method for the enumeration of presumptive Bacillus cereus -- Colony-count technique at 30 degrees

3. KINDS AND STYLES OF FRUITS

The fruit ingredient shall consist of each of the three fruit groups listed under Basic Fruits to which may be added any one or more of the fruits listed under Optional Fruits. The fruit shall be peeled, cored, trimmed, deseeded or pitted as may be applicable for the respective fruit in normal culinary preparation.

(a) Basic fruits

Pineapple (Ananas comosus (L.) Merrill) - tidbits, pieces, dices, chips or crisp cut.
Papaya (Carica papaya L.) or Mango (Mangifera indica L.) - singly or in combination - slices, dices or sections.
Banana (cultivated edible species of Musa) - slices or dices.

(b) Optional Fruits

Litchi (*Litchi chinensis* SONN.) - whole or broken segments.
Cashew (Anacardium occidentale L.) - as flesh.
Guava (Guayaba) - (Psidum guajava L.) - quarters, slices, dices or puree.
Longan (Euphoria longan) (LOUR. STEUD.) - whole or broken segments.
Oranges (Citrus sinensis (L.) OSBECK and Citrus reticulata BLANCO) (including Mandarin) whole segments.
Grapefruit (Citrus paradisi MACFAD) - whole or half segments.
Grapes (Cultivated edible species of Vitis) - whole grapes of any seedless variety.
Maraschino Cherries - (Prepared from fruit conforming with the characteristics of Prunus avium L.) whole or halves (and pitted).
Passion Fruit (Cultivated edible species of Passiflora) - pulp (flesh) with or without seeds.
Jack Fruit (Artocarpu integrifolia L.) - slices.
Melon (Cucumis melo L.) - slices, dices or balls.
Rambutan (Nephelium lappaceum L.) - whole or broken segments.
Peach (Prunus persica L. BATSCH) - pieces, dices or slices.
Pears (*Pyrus communis* L.) - pieces, dices or slices.

4. ESSENTIAL COMPOSITION AND QUALITY FACTORS

4.1 Proportion of Fruits (basic ingredients)

4.1.1 Fruits shall be of the following proportions, based on the individual drained fruit weights in relation to the drained weights of all the fruits:

Basic Fruits	**Minimum**	**Maximum**
Pineapple	45%	65%
Papaya or mango (singly or in combination)	25%	50%
Banana	5%	20 %
Optional Fruits	**Minimum**	**Maximum**
Litchi	5%	20 %
Melon	5%	20 %
Longan	5%	20 %
Guava (Guayaba) (Except puree, as specified in **4.1.2**)	5%	20 %

4.1.2 The following optional fruits are not considered in the determination of proportions of fruit, as their consistency after processing prevents an accurate determination of their drained weight. However, it is recommended that they make up the following percentages of the fruit ingredients present:

	Minimum	Maximum
Guava puree	5%	20%
Cashew	2%	5%
Passion fruit	1%	5%
Jack fruit	5%	15 %
Grape	3%	20 %
Rambutan	5%	20 %
Oranges (including Mandarin)	3%	15 %
Maraschino cherries	5%	4 %
Peach	5%	20 %
Grape fruit	3%	15%
Pears	5%	20%
Gooseberry	5%	20%
Water melon	5%	15%
Carambola	5%	20%

4.1.3 Acceptance

A lot will be considered as meeting the requirements for Proportions of Fruits when:
(a) The average of the individual fruit proportions (except those in 2.1.2 above) from all containers in the sample is within the range required for the individual fruits; and
(b) The number of individual containers, which are not within the range for any or one or more fruits, does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5 (see relevant Codex texts on methods of analysis and sampling).

4.2 Condition of Ingredients — The fruits and other ingredients used shall be clean, sound and fit for human consumption.

4.3 Packing Media

4.3.1 Canned tropical fruit salad may be packed in any one of the following packing media:

(*a*) *Water* — In which water is the sole packing medium.

(*b*) *Water and fruit juice* — In which water and fruit juice(s) from the specified fruits, is the sole liquid packing medium.

(*c*) *Fruit juice* — In which one or more fruit juice(s) from the specified fruits, which may be strained or filtered, is the sole liquid packing medium.

(*d*) *With sugar(s)* — Any of the foregoing packing media (*a*) through (*c*), may have one or more of the following sugars added: sucrose, invert sugar syrup, dextrose, dried glucose syrup, glucose syrup, fructose and fructose syrup.

4.3.2 Classification of Packing Media when Sugars Are Added

(a) When sugars are added to fruit juice(s), the liquid media shall be not less than 14º Brix, and they

are classified on the basis of the cut-out strength as follows:

(b)

Lightly sweetened: (name of fruit) Juice Not less than 14 º Brix

Heavily sweetened: (name of fruit) Juice Not less than 18 º Brix

(*b*) When sugars are added to water or water and one or more fruit juices the liquid media shall be classified on the basis of the cut-out strength as table 1:

Basic Syrup Strengths

Light Syrup - Not less than 14^0 Brix

Heavy Syrup - Not less than 18^0 Brix

Optional Packing Media

When not prohibited in the country of sale, the following packing media may be used;
Slightly Sweetened Water} - Not less than 10^0 Brix

Water Slightly Sweetened}- but less than 14^0 Brix

Extra Light Syrup}

Extra Heavy Syrup - Not less than 22^0 Brix

4.3.3 Compliance with packing media classification Cut-out strength of sweetened juice or syrup shall be determined on sample average, but no container may have a Brix value lower than that of the minimum of the next category below, if such there be.

4.4 Quality Criteria

4.4.1 Colour
Canned Tropical Fruit Salad shall have a colour characteristic of the mixed processed fruit, except that a slight bleaching of colour from the coloured cherries is acceptable.

4.4.2 Flavour
Canned Tropical Fruit Salad shall have a normal flavour and odour characteristic for the particular blend of fruit
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4.4.3 Texture
The texture of the fruit ingredient shall be appropriate for the respective fruit.
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4.4.4 Defects and Allowances — Canned tropical fruit salad shall be substantially free from defects within the following prescribed limits in table 2

TABLE 2. DEFECTS LIMITS

DEFECT	MAXIMUM LIMITS
(*a*) *Blemished fruit pieces* (Consisting of pieces of fruit with dark surface areas, spots penetrating the fruit, and other abnormalities)	2 pieces/100 g of drained fruit
(*b*) *Peel* (Based on averages) (Considered a defect only when occurring on, or from those fruits which are peeled)	6.5 cm^2/ 500g of total contents

(*c*) *Seeds* (Other than passion fruit seeds), Seed Material and Extraneous Vegetable Matter	2 g/500 g of total contents

4.4.5 Classification of 'Defectives' — A container shall be considered 'defective' when it fails to meet one or more of the applicable quality requirements in **4.4.1** through **4.4.4.**

4.4.5 *Lot Acceptance*

A lot will be considered as meeting the applicable quality and other requirements referred to in 2.3.5 when:
(a) for those requirements which are not based on average - the number of "defectives", as defined in sub-section 2.3.5, does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5 (see relevant Codex texts on methods of analysis and sampling); and

(b) the requirements which are based on sample averages are complied with.

5. FOOD ADDITIVES

	Additives	**Maximum Level in the End Product**
5.1	**Colouring Matter**	
	Erythrosine CI 45430 (1956) (To colour cherries)	Limited by Good Manufacturing Practice
5.2	***Flavours***	
5.2.1	*Cherry Laurel Oil* (To flavour artificially coloured cherries only)	10 mg/kg in the total product
5.2.2	*Bitter Almond Oil* (To flavour artificially coloured cherries only)	40 mg/kg in the total product
5.2.3	***Natural and synthetic flavourings***	Limited by Good Manufacturing Practice
5.3	**Anti-oxidants**	
	L-Ascorbic acid	700mg/kg
5.4	**Acidifying Agent**	
	Citric acid	Limited by Good Manufacturing Practice
5.5	**Firming Agents**	
5.5.1	*Calcium chloride*	350 mg/kg singly or in combination, calculated as Ca
5.5.2	*Calcium lactate*	
5.5.3	*Calcium gluconate*	

6 Contaminants

The products covered by this standard shall comply with the maximum levels of KS CODEX STAN 193.

6.1 Pesticide residues

The products covered by this standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission (CAC).

6.2 Heavy metal contaminants

The products covered by the provisions of this standard shall conform to those maximum limits for heavy metal contaminants established by the Codex Alimentarius Commission for these products in Table 3 when tested in accordance with the test methods prescribed therein.

Table 3 — Limits for heavy metal contaminants in canned Tropical fruit salad

Sl. No	Heavy Metal	Limits	Method Of Test
1.	Tin (Sn)	250 mg/kg, calculated as Sn	KS ISO 17240
2.	Lead (Pb)	1 mg/kg	AOAC 972.25 / KS ISO/TS 6733

7. HYGIENE

7.1 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *code of practice for processed fruits and vegetables* (KS 2752), and other recommended Codes of Practice which are relevant to this product.

7.2 To the extent possible in Good Manufacturing Practice, the product shall be free from objectionable matter.

7.3 When tested by appropriate methods of sampling and examination, the product:
- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

7.4 The products shall conform to microbiological criteria in Table 4.

Table 4 — Microbiological limits for canned Tropical Fruit Salad

S/N	Microorganism	Limit	Test method
i)	Aerobic plate count, cfu/g, max.	100	ISO 4833-1
ii)	*Clostridium botulinum,* cfu/25 g	Absent	ISO/TS 17919
iii)	*Bacillus cereus, cfu/g*	<100	KS ISO 7932

8. WEIGHTS AND MEASURES

8.1 Fill of Container

8.1.1 *Minimum Fill*

The container shall be well filled with fruit and the product (including packing medium) shall occupy not less than 90% of thewater capacity of the container. The water capacity of the container is the volume of distilled water at 20^{o}C which the sealed container will hold when completely filled.

8.1.2 Classification of 'Defective'

A container that fails to meet the requirement for minimum fill (90 percent container capacity) of 6.1.1 shall be considered a “defective”. A container shall be considered a “defective” that fails to meet one or more of the applicable quality requirements in 4.4.1 through 4.4.4.

8.1.3 Lot Acceptance

A lot will be considered as meeting the requirement of 8.1.2 when the number of “defectives” as defined in sub-section 6.1.2 does not exceed the acceptance number (c) of an appropriate sampling plan with an AQL of 6.5 (see relevant Codex texts on methods of analysis and sampling).

8.2 Minimum Drained Weight

8.2.1 The drained weight of the product shall not be less than 50% of the weight of distilled water at 20^{o}C which the sealed container will hold when completely filled; when tested in accordance to AOAC 968.30

8.2.2 The requirements for minimum drained weight shall be deemed to have been complied with when the average drained weight of all containers examined is not less than the minimum required, provided that there is no unreasonable shortage in individual containers.

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 requirements of the *General Standard for the Labelling of Pre-packaged Foods* (KS EAS 38), the following specific provisions apply:

10.1 The Name of the Food

10.1.1 The name of the product shall be “Tropical Fruit Salad”, “Tropical Fruit Cocktail” or “Tropical Fruit Mix”.

10.1.2 When the packing medium is composed of water, or water and one or more fruit juices in which water predominates, the packing medium shall be declared as part of the name or in close proximity thereto, as: “In water” or “Packed in water”.

10.1.3 When the packing medium is composed solely of a single fruit juice, the packing medium shall be declared as part of the name or in close proximity thereto, as: “In (name of fruit) juice”

10.1.4 When the packing medium is composed of two or more fruit juices, it shall be declared as part of the name or in close proximity thereto, as: “In (name of fruits) juice” or “In fruit juices” or “In mixed fruit juices”

10.1.5 When sugars are added to one or more fruit juices, the packing medium shall be declared as may be appropriate:

'Lightly sweetened (*name of fruit*) juice'
or
'Heavily sweetened (*names of fruits*) juice(s)'
or
'Lightly sweetened fruit juices'
or
'Heavily sweetened mixed fruit juice(s)'

10.1.6 When sugars are added to water, or water and one or more fruit juices, the packing medium shall be declared as may be appropriate:

'Light syrup' or 'Heavy syrup'
or
'Water slightly sweetened' or 'Slightly sweetened water'
or
'Extra light syrup' or 'Extra heavy syrup'

10.1.7 When the packing medium contains water and one or more fruit juice(s), in which the fruit comprises 50% or more by volume of the packing medium, the packing medium shall be designated to indicate the preponderance of such fruit juice, as for example:

'(names of fruits) juice(s) and water'

10.2 List of Ingredients

10.2.1 A complete list of ingredients shall be declared on the label in descending order of proportion, except as provided for in **9.2.2** and **9.2.3 below.**

10.2.2 The declaration of Maraschino Cherries shall be:

'Cherries artificially coloured with added flavourings'

10.2.3 If L-ascorbic acid is added to preserve colour, its presence shall be declared in the list of ingredients in the following manner:

“L-ascorbic acid added as an antioxidant”

10.3 Net Contents — The net contents shall be declared by weight in the metric ('systeme International') units.

10.4 Name, Location and Address — The name, location and address of the manufacturer, packer, distributor, importer, exporter or vendor of the product shall be declared.

10.5 Country of origin

10.5.1 The country of origin of the product shall be declared, e.g. 'Produce of Kenya'.

10.5.2 When the product undergoes processing in a second country which changes its nature, the country in which the processing is performed shall be considered to be the country of origin for the purposes of labelling.

10.6 The date of manufacture shall be declared.

10.7 Pictorial representations- A pictorial representation of fruit(s) on the label should not mislead the consumer with respect to the fruit so illustrated.

10.8 Drain weight declaration content- Canned tropical fruit salad must be labelled with a declaration of “Drained weight content __%.

10.10 date of manufacture

10.11 Expiry date

10.11 Instructions for use and storage shall be declared

10.12 Batch or code number;

10. METHODS OF ANALYSIS

The products covered by the provisions of this standard shall be sampled and 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.

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ANNEX A

DETERMINATION OF PROPORTIONS OF FRUITS

A1. PROCEDURE

(i) Determine drained weight and keep liquid and fruit separate.

(ii) Separate individual fruit ingredients, removing those fruits present in lesser amounts (such as cherries, grapes).

(iii) Weigh the individual fruit ingredients to the nearest gram.

(iv) Record the weight of each fruit and add all of these weights.

A2. CALCULATION AND EXPRESSION OF RESULTS

Calculate the percentage of fruit proportions:

$$\frac{\text{The weight of each fruit} \times 100}{\text{Sum of all fruit weights}} = \% \text{ of the weight of each fruit}$$

ANNEX B

DETERMINATION OF DRAINED WEIGHT

B1. APPARATUS

B1.1 A Suitable Sieve

B2. PROCEDURE

Carefully weigh the clean and dry sieve. Weigh the can plus contents. Empty the contents of the can into the sieve taking care to distribute the fruits evenly. Without shifting the product, incline the sieve at an angle of approximately 17º to 20º to facilitate drainage. Drain the product for two minutes and then weigh the sieve plus the product. Weigh the empty can.

B3. CALCULATION

Drained weight, in grams = Weight of product plus sieve, in grams - (minus) weight of sieve, in grams

Net weight of contents of can, in grams = Weight of can plus contents - (minus) weight of empty can

$$\text{Drained weight, as percentage of net weight} = \frac{\text{Drained weight, in grams} \times 100}{\text{Net weight of contents of can, in grams}}$$

ANNEX C

DETERMINATION OF SYRUP DENSITY

C1. EXPLANATION

The Brix hydrometer method shall be used. In cases of dispute the Abbe' refractometer method shall be used as the final referee method.

C2. APPARATUS

C2.1 Brix Hydrometer — Covering the ranges to be measured and calibrated at 0.1º intervals.

C2.2 Abbe' Refractometer — Fitted with a Brix (sugar) scale.

C2.3 Thermometer — 0ºC to 100ºC.

C2.4 Glass Cylinder — The diameter should be at least 12 mm larger than the hydrometer bulb.

C3. PROCEDURE

C3.1 Brix Hydrometer Method — Use the syrup from Annex B.

Mix the sample thoroughly.
Pour into the glass cylinder and allow the sample to stand until all the air bubbles escape.
Lower the hydrometer slowly into the sample taking care that the hydrometer does not touch the side of the glass cylinder.
Take the reading to the nearest 0.1º and measure the temperature of the samples at which the reading is taken.
Make temperature corrections to this reading for temperatures above 20ºC **(*see* Table 4).**

C3.2 Abbe' Refractometer Method — Use the thoroughly mixed sample, and take the Brix refractometer. Circulate water through the refractometer to obtain a constant temperature at the same time the Brix reading is taken. Make temperature corrections to this reading for temperatures above 20ºC (*see* Table 4).

TABLE 4. TEMPERATURE CORRECTION TABLE FOR SUGAR REFRACTOMETER (STANDARD AT 20ºC) [ADD TO OBSERVED BRIX (SUGAR) READINGS]

TEMP. ºC	OBSERVED PERCENTAGE BRIX (SUGAR)						
	0	5	10	15	20	25	30
21	0.04	0.05	0.06	0.06	0.06	0.07	0.07
22	0.10	0.10	0.11	0.12	0.12	0.13	0.14
23	0.16	0.16	0.17	0.17	0.19	0.20	0.21
24	0.21	0.22	0.23	0.24	0.26	0.27	0.28
25	0.27	0.28	0.30	0.31	0.32	0.34	0.35
26	0.33	0.34	0.36	0.37	0.40	0.40	0.42
27	0.40	0.41	0.42	0.44	0.46	0.48	0.50
28	0.46	0.47	0.49	0.51	0.54	0.56	0.58
29	0.54	0.55	0.56	0.59	0.61	0.63	0.66
30	0.61	0.62	0.63	0.66	0.68	0.71	0.73
35	0.99	1.01	1.02	1.06	1.10	1.13	1.16
40	1.42	1.45	1.47	1.51	1.54	1.57	1.60
45	1.91	1.94	1.96	2.00	2.03	2.05	2.07
50	2.46	2.48	2.50	2.53	2.56	2.57	2.58
55	3.05	3.07	3.09	3.12	3.12	3.12	3.12
60	3.69	3.72	3.73	3.73	3.72	3.70	3.67