KENYA STANDARD

DKS 1756:2021
ICS 67.100.10

Flavoured milk— Specification

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TECHNICAL COMMITTEE REPRESENTATION

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Coca-Cola Company
Directorate of Veterinary Services, Ministry of Agriculture, Livestock and Fisheries
Egerton University
Glacier Products Ltd
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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, Kenya Bureau of Standards, are welcome.

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Foreword

This Kenya Standard was prepared by the Milk and Milk Products Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards

Conversion of milk into flavoured milk is a recognized form of its marketing. The product is similar to the ultra-high temperature (long life) treated and pasteurized milk except that it is flavoured and sweetened to taste. It has consumer acceptability and appeal. Its manufacture fits in with the routine milk handling and processing procedures in the dairy.

The organized dairies in the country have, therefore started the production of flavoured milk. This standard is being issued to help these dairies in controlling the quality and also for guiding other dairies in taking up the production of flavoured milk.

This standard cancels and replaces KS 1756:2001, Specification for flavoured milk.

During the preparation of this standard, reference was made to the following documents.

KS EAS 27, UHT Milk- Specification

KS EAS KS EAS 69, Pasteurized milk.

IS 4709, Specification for flavoured milk.

IS 4709, Specification for sterilized milk.

Acknowledgement is hereby made for the assistance derived from these sources.

Flavoured milk— Specification

1 Scope

This Kenya Standard specifies the requirements, methods of sampling and test for flavoured milk.

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 946.04, Official method for Phosphatase (residual) in ice cream and frozen desserts

AOAC 999.10, Official method for lead, cadmium, zinc, copper, and iron in foods Atomic absorption Spectrophotometry after microwave Digestion

KS 1552, Code of hygienic practice for milk and milk products

KS EAS 27, UHT milk- Specification

KS EAS 38, Labelling of pre-packaged foods — General requirements

KS EAS 39, Hygiene in the food and drink manufacturing industry — Code of practice

KS EAS 69, Pasteurized milk — Specification

EAS 803, Nutrition labelling — Requirements

KS ISO 707, Milk and milk products — Guidance on sampling

KS ISO 14501, Milk and milk powder — Determination of aflatoxin M1 content — Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography

KS ISO 2446, Milk — Determination of fat content

KS ISO 4832, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony count technique

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 5764, Milk — Determination of freezing point — Thermistor cryoscope method (Reference method)

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

KS ISO 6731, Milk, cream and evaporated milk — Determination of total solids content (Reference method)

KS ISO 6888-3, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers

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 11290-1, Microbiology of the food chain — Horizontal method for the detection and enumeration of

KS Listeria monocytogenes and of Listeria spp. — Part 1: Detection method

ISO 11816-1, Milk and milk products — Determination of alkaline phosphatase activity — Part 1: Fluorimetric method for milk and milk-based drinks

KS ISO 14501, Milk and milk powder — Determination of aflatoxin M1 content — Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography

3.1 Definitions

For the purposes of this standard, the following definitions shall apply:

3.1
raw milk
normal, clean and fresh secretion extracted from the udder of a healthy cow, properly fed and kept, but excluding that got during the first seven days after calving

3.2
UHT or long life milk
the milk, ultra-high temperature treated, homogenized, filled and sealed aseptically into sterile retail containers in order to achieve commercial sterility

3.3
homogenized milk
the milk in which, the milk fat globules have been finely divided and interspersed to form a homogeneous product so as to prevent the fat from floating on the surface and adhering to the inside of the container

3.4
sterilized milk
milk which has been heated in sealed container continuously to a temperature of either 115 ºC for 15 min or at least 130 ºC for a period of 1 s or more in a continuous flow and then packed under aseptic condition in hermatically sealed containers to ensure preservation at room temperature for a period not less than 15 days from the date of manufacture

3.5
standardized milk
cow milk that has been standardized to fat and solids-not-fat percentage by the adjustment of milk solids. Standardized milk shall be pasteurized and shall show a negative phosphatase.

3.6
pasteurized milk
milk which has been efficiently heat treated at a sufficiently high temperature for appropriate period of time to ensure complete destruction of all pathogenic organisms, so as to enable the product to be transported, distributed and consumed as liquid milk

3.7
flavoured milk

flavoured milk shall be pasteurized, sterilized milk or boiled with added permitted flavours as approved by the Food, Drugs and Chemical Substance Act, Cap. 254 of the Laws of Kenya and any relevant Kenya Standard.

May contain nuts (whole, fragmented or ground) chocolate, coffee or any other edible flavour, edible food colours and cane sugar.

3.8
reconstituted milk
product resulting from the addition of water to the dried or concentrated form of the cow milk product in the amount necessary to re-establish the appropriate water to solids ratio

3.9
commercial sterility
condition achieved by application of heat sufficient, alone or in combination with other appropriate treatment to render food free from microorganisms capable of growing in the food as normal non-refrigerated conditions at which the food is likely to be held during distribution and storage

3.10
recombined milk
product resulting from the combining of milk fat and milk solids non-fat in their preserved forms with or without the addition of water to achieve the appropriate milk product composition

3.11
toned milk
product prepared by a mixture of cow milk with skimmed milk or powdered milk in the amount necessary to reestablish the appropriate milk product composition

4.1 Types

Flavoured milk shall be of the following types:

a) Pasteurized, and
b) Sterilized.

4.2 Categories

4.2.1 Flavoured UHT or Pasteurized milk shall be categorized as follows:

a) whole milk/full cream milk;
b) fat reduced milk/semi skimmed milk/low fat milk; and
c) fat free milk/skimmed milk.

4.2.2 The prcduct shall also be categorized according to the flavour added as chocolate milk, Vanilla milk, fruit flavour milk, etc.

5 Requirements

5.1 Raw material

Flavoured milk shall be prepared from;

Pasteurized milk complying with KS EAS 67.
UHT milk complying with KS EAS 27

5.2 General requirements

Flavoured milk shall:

a) have characteristic texture and colour;
b) be free from foreign matter;
c) be free from preservatives, off-flavours and odour;
d) not exhibit Visible sediments other than from the flavour used; and
e) not exhibit Bitterness and metallic flavor

5.3 Permitted ingredients

All ingredients used for the manufacture of flavoured milk shall be of good quality complying with the relevant standards.

5.3.1 Flavour — Only permitted flavours shall be used. These shall comply with the guidelines given in the most current issue of Codex Alimentarius Commission

5.3.2 Nutritive and non-nutritive (intense) sweeteners – Nutritive and/or non-nutritive (intense) sweetener blends may be used. The sugar used shall comply with the requirements of the relevant Kenya Standard. Non-nutritive sweeteners shall comply with the provisions established levels given by the Codex Alimentarius Commission.

5.3.3 Permitted fruit juices which are concentrated or canned may also be used. These shall conform with the requirements of the relevant Kenya Standard.

5.3.4 Permitted food colours may be added. These shall comply with the levels stipulated in the Codex Alimentarius Commission.

5.3.5 Stabilizers and emulsifiers/antioxidants permitted under guidelines of the Codex Alimentarius Commission may be used.

5.3.6 No Preservatives shall be added to flavoured milk.

5.4 Specific requirements

Flavoured milk shall comply with specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific requirements for flavoured milk

S/N	Characteristic	Requirement	Test method
i.	pH variation on 7 days incubation (max.)	0.3	Annex A
ii.	Titratable acidity variation on 5 days incubation, % lactic acid	0.02	Annex B

	(max.)		
iii.	Density at 20 °C g/ml,	1.028 - 1.036	Annex C
iv.	Milk fat (%), m/m		KS SO 2446
	a) Whole milk/full cream milk, min.	3.25	
	b) Fat reduced milk/semi skimmed	1.51 - 3.24	
	c) Low fat milk/skimmed milk	0.51 - 1.50	
	d) Fat free milk, max.	0.50	
v.	Milk Solids Non-Fat, %, max.	8.5	KS ISO 6731
vi.	Protein content, %, min.	3	KS ISO 8968-4
vii.	Freezing point, °C	-0.550 to -0.525 I	KS ISO 5764
	Phosphatase test	Negative	ISO 11816-1/ AOAC 946.04

6 Food additives

Only those additives justified may be used for the product and shall comply with the provisions given in the CODEX STAN 192

7 Hygiene

7.1 Flavoured milk shall be produced and handled in accordance with KS 1552 and KS EAS 39.

7.2 Flavoured shall comply with microbiological limits given in Table 2 when tested in accordance with the test methods specified therein

Table 2 — Microbiological limits for flavoured milk

S/N	Microorganism	Requiremets		Test method
		Sterilized	Pasteurized	
i)	Total plate count, per mL, max	10	30,000	KS ISO 4833-1
ii)	Coliforms, per mL , max	Nil	10	KS ISO 4833-1
iii)	*Escherichia coli,* per mL, max	Nil	Nil	KS ISO 11866
	Listeria monocytogenes, per 25 ml	Nil	Nil	KS ISO 11290-1
vi)	*Salmonella,* per 25 mL	Nil	Nil	KS ISO 6785
	Staphylococcus aureus (coagulase positive), CFU/ ml	Nil	Nil	KS ISO 4833-1

8 Contaminants

8.1 Pesticide residues

Flavoured milk shall comply with maximum limits residues set by Codex Alimentarius Commission.

8.2 veterinary drug residues

Flavoured milk shall comply with the maximum residue limits set by the Codex Alimentarius Commission.

8.3 Heavy Metal

When tested in accordance with AOAC 999.10, the level of Lead (Pb) shall not exceed 0.02 mg/kg

8.4 Mycotoxins

When tested in accordance with ISO 14501, the level of aflatoxin M1 shall not exceed 0.50 µg/kg.

9 Packaging

9.1 The packaging material used for Flavoured milk shall be food grade and shall:

a) be lightproof;
b) be gas-proof;
c) be mechanically strong;
d) be non-toxic;
e) not impart any off-flavour to the milk;
f) be able to withstand aseptic packaging pre-treatment procedure; and
g) allow hermetic sealing.

9.2 The packaging material used for Flavoured milk shall be food grade and shall:

9.3 The packaging material used for flavoured milk shall be food grade and shall:

10 Labelling

The containers shall be labelled in compliance with the requirements of EAS 38 and EAS 803. In addition, the following particulars shall be legibly and indelibly labelled on the container:

a) name of the product as ‘Flavoured milk’.

b) Fat content; categories as either:

(i) whole milk/full cream milk;

(ii) fat reduced milk/semi skimmed milk/low fat milk; or

(iii) fat free milk/skimmed milk;

c) The type of flavour used;

d) List of ingredients — a complete list of ingredients used shall be declared on the label in descending order of proportion;

e) net content;

f) name and physical address of manufacturer;

g) batch or code number;

h) nutritional information;

i) date of manufacture and expiry date;

j) instruction for storage and use; and

k) country of origin

10.2 Standardization of milk

Flavoured milk, which is standardized during processing to butterfat content below 3.25, shall distinctly and legibly be declared on the package 'Standardized Milk' in same print. The percentage of fat shall also be shown.

11 Sampling

Sampling of flavoured milk shall be done in accordance to KS ISO 707.

Annex A
(normative)
Determination of pH variation

A.1 Apparatus

A.1.1 Incubator, adjusted at 55 ºC ± 1 ºC

A.1.2 pH meter

A.2 Procedure

A.2.1 Determine the pH of 50 mL of the sample in the flask, with a glass electrode at 20 ºC and note reading. Then incubate another 50 mL of the sample at 55 ºC ± 1 ºC for five days. Examine the flask each day, then shake and replace it in the incubator. If any physical alteration of the contents is observed (coagulation with, or without exudation, grittiness, flocculation, formation of bubbles or scum peptonization or proteolysis) the result of the test shall be considered positive and the sample as nonsterile.

A.2.2 If no alteration takes place during the five days' incubation at 55 ºC ± 1 ºC, remove the sample from the incubator and cool to room temperature. Take a small portion of it and measure the pH in the pH meter with glass electrode at 20 ºC. From this pH value subtract the initial pH value (A.2.1).

A.3 Interpretation of results

A sample which does not show any physical alteration during incubation at 55°C ± 1 °C for five days and where the pH does not show a difference of more than 0.3 unit from the initial pH is considered sterile.

Annex B
(normative)

Determination of titratable acidity

B.1 Apparatus

B.1.1 Incubator

B.1.2 Burette, with soda-lime guard tube.

B.1.3 Porcelain dishes, white hemispherical of approximately 60 mL.

B.1.4 Stirring rods, of glass, flattened at one end.

B.2 Reagents

B.2.1 Standard sodium hydroxide solution, 0.1 M.

Prepare concentrated stock solution of sodium hydroxide by dissolving equal parts of sodium hydroxide (stocks or pellets) in equal parts of water in a flask. Tightly stopper the flask with a rubber bung and allow any insoluble sodium carbonate to settle down for three to four days.

Use the clear supernatant liquid for preparing the standard 0.1 M solution. About 8 mL of stock solution is required per litre of distilled water. The solution should be accurately standardized against acidic potassium phthalate or oxalic acid.

B.2.2 Phenolphthalein indicator solution

Dissolve 1 g of phenolphthalein in 110 mL rectified spirit. Add 0.1 M sodium hydroxide solution until one drop gives a faint pink coloration.

B.2.3 Rosaniline acetate stock solution

Dissolve 0.121 g of rosaniline acetate in approximately 50 mL of rectified spirit, containing 0.5 mL of facial acetic acid. Make up to 100 mL with rectified spirit.

B.2.4 Bench solution

Dilute 1 mL of stock solution to 500 mL with a mixture of rectified spirit and distilled water in equal proportions by volume.

The stock and the bench solutions shall be stored in dark brown bottles securely stoppered with rubber bungs.

B.3 Procedure

B.3.1 Acidity of fresh sample

Weigh 10.0 g of the sample into each of the two white porcelain dishes of approximately 60 mL capacity; add to both 10 mL of water and stir to disperse the sample. Prepare from one dilution a colour control by adding and stirring 2 mL dilute rosaniline acetate solution. Stir 2 mL phenolphthalein solution into the other dilution and while stirring vigorously, add as rapidly as possible sodium hydroxide solution from a 10 mL burette fitted with a soda-lime guard tube, until the colour matches the pink colour of the control. The titration shall be done in bright light.

B.3.2 Acidity after incubation

Incubate another 20 g of sample at 55 °C ± 1 °C for five days. Examine the flask each day, then shake and replace it in the incubator. If any physical alteration (as indicated in A.2.1) of the content is observed the results of the test shall be considered positive and the sample as non-sterile.

If no alteration takes place during the five days incubation remove the sample from the incubator and cool to room temperature. Weigh 10 g of the incubated sample and determine acidity as described in B.3.1.

B.4 Calculation

B.4.1 Acidity of fresh sample

Titratable acidity (as lactic acid) per cent by weight = $\frac{9V.M}{w}$

where,

V is the volume, in mL of the standard sodium hydroxide required for titration (see B.2.1);

M is the molarity of the standard sodium hydroxide solution (see B.2.1); and

m is the mass, in g of the sample taken for test (see B.3.2).

B.4.2 Acidity after incubation

B.4.2.1 Titratable acidity (as lactic acid) percent by weight = $\frac{9V.M}{w}$

where,

V is the volume, in mL of the standard sodium hydroxide required for titration (see B.2.1);

M is the molarity of the standard sodium hydroxide solution (see B.2.1);

w is the weight, in g of the sample taken for the test (see B.3.2).

B.4.2.2 Subtract the value obtained in B.4.1 from the value obtained in B.4.2 which would give increase in acidity.

B.5 Interpretation of results

A sample which does not show any physical alteration during incubation at 55 °C ± 1 °C for five days and where the acidity does not show a difference of more than 0.02 g from the initial acidity is considered sterile.

Annex C

(normative)

Determination of density

A.1 General

The density is a relationship between the body mass and the volume this body occupies in the space. The density test is performed in order to be used in the detection of adulteration in the milk since, the addition of water only would cause the decrease in density, whereas the skimming (fat removal) would cause an increased density in the milk, beside supplying important information for the determination of the total dry extract.

A.2 Equipment

A.2.1 Thermolactodensimeter (TLD)

A.2.2 Test tube, 250 ml

A.3 Method

The density determination is accomplished by the thermolactodensimeter (TLD) because of the practicability of this method.

A.4 Procedure

A.4.1 Place the sample to be analyzed in the clean and dry test tube by carefully inclining the test tube and allowing the liquid to flow down the walls of the glass to avoid incorporation of air which would reduce the density of the milk.

A.4.2 Immerse TLD into the test tube and make it rotate slowly on its own axis.

A.4.3 Take the reading of both density and temperature of the milk as soon as TLD stabilizes.

A.4.4 By using an adequate scale, correct the influence of the temperature. The result will correspond to the corrected milk density.