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DRAFT UGANDA STANDARD

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Flavoured milk – Specification

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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to co-ordinate the elaboration of standards and is

(a) a member of International Organisation for Standardisation (ISO) and

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(c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC2, *[Food and Agriculture]*, Subcommittee SC1, *[milk and milk products]*.

This second edition cancels and replaces the first edition (US 1597:2015), which has been technically revised.

Flavoured Milk — Specification

1 Scope

This draft Uganda standard specifies requirements and methods of sampling and test for flavoured milk from cow, goat, camel, buffalo, or sheep milk.

This standards does not apply to raw flavoured milk.

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.

US 28, *Hygiene in the food and drink manufacturing industry – Code of practice*

US 45, *General standard for food additives*

US 163, *Code of hygiene practice for milk and milk products*

US 738, *General standard for contaminants and toxins in food and feed*

US 217-5/EAS 217-5, *Methods for microbiological examination of foods – Part 5: Enumeration of coagulase-positive Staphylococci*

US EAS 38, *Labelling of pre-packaged foods – Requirements*

US EAS 67, *Raw cow milk – Specification*

US 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*

US EAS 68-2-2, *Milk and milk products — Methods of microbiological examination — Part 2-2: Enumeration of coliforms — Most probable number technique at 30 °C*

US EAS 68-3; *Milk and milk products — Methods of microbiological examination — Part 3: Enumeration of colony forming units of yeasts and/or moulds - Colony-count technique at 25 °C*

US ISO 707; *Milk and milk products – Guidance on sampling (2nd Edition)*

US ISO 2446, *Milk – Determination of fat content*

US ISO 5764, *Milk – Determination of freezing point – Thermistor cryoscope method (Reference method)*

US ISO 6731, *Milk, cream and evaporated milk – Determination of total solids content (Reference method)*

US ISO 6785*, Milk and milk products — Detection of Salmonella spp*.

US ISO 8968-3, *Milk – Determination of nitrogen content – Part 3: Block-digestion method (Semi-micro rapid routine method)*

US ISO 11866-1, *Milk and milk products — Enumeration of presumptive Escherichia coli — Part 1: Most probable number technique using 4-methylumbelliferyl-beta-D-glucuronide (MUG)*

US ISO 11866-2, *Milk and milk products — Enumeration of presumptive Escherichia coli — Part 2: Colony-count technique at 44 ° C using membranes*

3 Terms and definitions

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

3.1
flavoured milk
milk which is heat treated and with added permitted flavours and other ingredients such as sugar, colour and stabilizers

3.2
raw cow milk
normal, clean and fresh secretion obtained by practically emptying the udder of a healthy animal, that has been properly fed and kept, but excluding that got during the first seven days after calving

3.3
UHT or long life milk
milk which is ultra-high temperature treated, homogenized, standardized, filled and sealed aseptically in retail containers in order to attain commercial sterility

3.4
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 under cold chain and consumed as liquid milk

3.5
homogenization
process by which milk fat globules are 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

3.6
standardization
the process of raising or lowering of fat and solids not fat levels of milk in order to have a uniform fat content in the finished processed product

3.7
commercial sterility
attained practical sterility after the product has been treated aiming at absolute sterility

3.8
food grade 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 odour or flavour to the product

4 Requirements

4.1 Essential Ingredients

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

4.1.2 The milk used may be whole milk, skimmed milk, reconstituted/recombined powered milk or a mixture of two or more products complying with the relevant standards.

4.1.3 Only permitted ingredients shall be used in the processing of flavoured milk.

4.2 General requirements

Flavoured milk shall:

a) be normal in texture, colour and odour;

b) be processed without affecting the composition of the product;

c) be free of visible sediments other than from the ingredients used;

d) be free from off flavour taints;

e) not be bitter; and

f) have a pleasant and acceptable taste.

4.3 Specific requirements

4.3.1 Flavoured milk shall comply with the specific requirements stipulated in table 1.

Table 1 — Specific requirements for flavoured milk

S/No.	Parameter	Requirement		Test method
		UHT Flavoured milk	Pasteurised flavoured milk	
i)	pH variation on 5 days incubation, max.	0.3	-	Annex A
ii)	Titratable acidity variation on 5 days incubation, % lactic acid, max.	0.02	-	Annex B
iii)	Milk fat %, m/m a) Whole milk, min. b) Fat reduced milk c) Low fat milk d) Fat free milk, max.	 a) 3.1 b) 1.5- 3.25 c) 0.5 – 1.5 d) 0.5	 a) 3.1 b) 1.5- 3.25 c) 0.5 – 1.5 d) 0.5	US ISO 2446
iv)	Density at 20 ^{0}C, g/mL	1.040 – 1.060	1.028 – 1.032	
v)	Freezing point depression, ^{0}C,	0.525 – 0.550		US ISO 5764
vi)	Milk solids-not fat, %, min.	8.5		US ISO 6731

vii)	Protein, %, min	3		US ISO 8968-3
Note: The parameter “milk solids-not fat” is determined by calculation from total solids content and fat content				

5 Food additives

Food additives used in the preparation of flavoured milk shall be in accordance with US 45.

6 Contaminants

6.1 Pesticide and veterinary drug residues

Flavoured milk shall conform to those maximum limits for pesticide and veterinary drug residues established by the Codex Alimentarius Commission.

6.2 Other contaminants

Flavoured milk shall conform to those maximum limits for other contaminants established under US 738.

7 Hygiene

Flavoured milk shall be produced, processed, handled and marketed under hygienic conditions and in appropriate premises in order to prevent contamination of the product in accordance with US 28 and US 163.

Flavoured milk shall comply with the limits for micro-organisms specified in table 2.

Table 2 — Microbiological limits for flavoured milk

Microorganism	Limit		Method of test
	UHT flavoured milk	Pasteurised flavoured milk	
Total plate count, CFU/ml, max.	10	1000	US ISO 4833-1
*Coliform*s, MPN/ml, max.	Absent	10	US ISO 4833
E. Coli, MPN/ml, max.	Absent	Absent	US ISO 11866-1
Yeast and moulds, CFU/ml	10	10	US EAS 68-3
Staphylococcus aureus, CFU/ml, max.	Absent	Absent	US ISO4833
Salmonella in 25 ml, max.	Absent	Absent	US ISO 6785
Listeria Monocytogenes	Absent	Absent	US ISO 10560
Shigella in 25 ml max	Absent	Absent	

8 Weights and measures

The weight/volume of the flavoured milk shall comply with the weights and measures requirements.

9 Packaging

Flavoured milk shall be packaged in food contact grade containers which conform to US 1659.

10 Labelling

In addition to the requirements in US EAS 38, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

a) name of the product as “X Flavoured milk” where “X” is replaced by the specific flavour used in the product;

b) type of heat treatment

c) type of animal from which the milk was got.

d) complete list of ingredients to be declared in descending order of proportion;

e) name and physical address of processor/producer;

f) batch or code number;

g) storage conditions and instructions;

h) date of manufacture;

i) expiry date;

j) net content in metric units; and

k) country of origin.

11 Sampling

Sampling shall be done in accordance with US ISO 707.

Annex A
(normative)

Determination of pH variation

A.1 Apparatus

A.1.1 Incubator adjusted at 55 °C ± 1 °C

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 °C and note reading. Then incubate another 50 mL of the 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 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 non-sterile.

A.2.2 If no alteration takes place during the five days incubation at 55 °C ± 1 °C 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 °C. 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 glacial acetic acid. Make up to 100 mL with rectified spirit.

For the 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.

NOTE The stock and the bench solutions should 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

$$\text{Titratable acidity (as lactic acid) per cent by weight} = \frac{9VM}{m}$$

where,

V is the volume, in mL, of the standard sodium hydroxide required for titration (B.3.1), M is the molarity of the standard sodium hydroxide solution (B.3), and

m is the mass, in g, of the sample taken for test (B.3.1).

B.4.2 Acidity after incubation

$$\text{Titratable acidity (as lactic acid) percent by weight} = \frac{9VM}{w}$$

where,

V is the volume, in mL, of the standard sodium hydroxide required for titration (B.3.2.1),

M is the molarity of the standard sodium hydroxide solution (B.3.2.1),

w is the weight in g of the sample taken for the test (B.3.2.1)

B.4.3 Increase in acidity

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.

Bibliography

[1] RS 194:2013, Flavoured milk – Specification

[2] US 1597:2015, Flavoured UHT milk – Specification

Certification marking

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