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Pasteurized goat 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

(b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and

(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/TC 2, *Food and Agriculture*, Subcommittee SC 1, *Milk and milk products*.

Pasteurized goat milk — Specification

1 Scope

This Draft Uganda Standard specifies the requirements and methods of test and sampling for pasteurized goat's milk.

2 Normative references

The following referenced documents 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.

US 1548, *Raw goat milk – Specification*

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

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

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

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

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

US 163*, Milk and milk products — Hygiene requirements*

US 28, *Code of practice for hygiene in the food and drink manufacturing industry*

US ISO 707*, Milk and milk products – Guidance on sampling*

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

US EAS 803*, Nutrition labelling — Requirements*

US EAS 804*, Claims on food — Requirements*

US 1659*, Materials in contact with food — Requirements for packaging materials*

US ISO 14501*, Milk and milk powder – Determination of Aflatoxin M1 content – Clean-up by immunoaffinity chromatography and determination by high-performance liquid chromatography*

US ISO 6888 *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*

US ISO 6579–1*, Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp*

US ISO 11290-1 *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of Listeria monocytogenes — Part 1: Detection method*

US ISO 7251*, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

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

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.*

3 Terms and definitions

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

3.1
Raw whole milk

whitish ,normal, clean and fresh secretions obtained by practically emptying the udder of a healthy goat, properly fed and kept, but excluding that got during the first seven days after kidding and free from colostrum

3.2
Pasteurisation

heat treatment process applied to a product with the objective of eliminating possible health hazards arising from pathogenic micro-organism associated with milk by heat treatment which is consistent with minimal chemical, physical and organoleptic changes in the product

3.3
Pasteurised goat milk

goat milk that has been subjected to pasteurization process as defined in 3.2 and chilled to 7 °C immediately, If retailed as such, this milk should be chilled to 7 °C and packaged without delay under conditions which eliminate contamination

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Pasteurization process

The recommended method of pasteurization shall be as follows

4.1 Batch method

The temperature of milk shall be raised to not less than 65 °C and not more than 72 °C and retained within this range for 30 min and immediately and rapidly cooled to 4 ºC or less

4.2 High temperature short time method (H.T.S.T.)

The temperature of milk shall be raised to not less than 72 °C and not more than 80 °C and retained within this range for 15 s and immediately and rapidly cooled to 4°C or less

5 Requirements

5.1 General requirements

Pasteurized goat milk shall:

a) be obtained from raw goat milk conforming to US 1548

b) pass the goat milk authentication test when test in accordance to Annex B;

c) have characteristic texture and colour;

d) be free from foreign matter; and

e) be free from preservatives, off-flavours and odour

5.2 Specific requirements

Pasteurized goat 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 pasteurized goat milk

Characteristic	Requirement	Test method
Milk fat, %, m/m min	3.5	US ISO 2446
Milk solids not fat %m/m , min	8.5	US ISO 6731
Density at 20 °C, g/ml	1.028 - 1.034	Annex A
Freezing point depression	0.480 ^{0} C to 0.568 ^{0} C	US ISO 5764
Phosphatase	Negative	US ISO 11816-1

6 Hygiene

Pasteurized goat milk shall be produced and handled in accordance with US 163 and US EAS 39.

Table 2 — Microbiological limits for pasteurized goat milk

Microorganism	Maximum limit	Test method
Total plate count, CFU/ml	3 x 10^4	US ISO 4833-1
Total coliforms, CFU/ml	10	US ISO 4832
Escherichia coli, per ml	Absent	US ISO 7251
Listeria monocytogenes, per 25 ml	Absent	US ISO 11290-1
Salmonella Spp, per 25	Absent	US ISO 6579-1
Staphylococcus aureus, per ml	Absent	US ISO 6888-3

7 Contaminants

7.1 Pesticide residues

Pasteurized goat milk shall comply with maximum residue limits set by Codex Alimentarius Commission

7.2 Veterinary drugs residues

Pasteurized goat milk shall comply with maximum tolerable residue limits for antibiotics and other veterinary drugs set by Codex Alimentarius Commission.

7.3 Heavy metals

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

7.4 Mycotoxins

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

8 Packaging

Pasteurized goat milk shall be packed in food grade packaging material conforming to US 1659.

9 Labelling

The containers shall be labelled in compliance with the requirements of US EAS 38, US EAS 803 and US EAS 804. In addition, the following particulars shall be legibly and indelibly labelled on the container:

a) name of the product as “Pasteurized goat milk”;

b) fat content;

c) net content in SI units;

d) name and physical address of manufacturer;

e) batch or code number;

f) nutritional information;

g) date of manufacture and expiry date;

h) instruction for storage and use; and

i) country of origin

10 Sampling

Sampling of pasteurized goat milk shall be done in accordance with US ISO 707.

Annex A
(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..

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Annex B
(normative)

Method of Analysis or Identifying Goats Milk from other Dairy Milk

B.1 Equipment / apparatus

B.1.1 Polymerase Chain Reaction machine (thermal cycler)

B.1.2 Water bath

B.1.3 Micro pipettes

B.1.4 Vertex

B.1.5 Micro centrifuge

B.1.6 Agarose Gel documentation machine

B.1.7 Conical flask

B.1.8 Ice cubes

B.1.9 PCR tube rack

B.1.10 Stairoform

B.1.11 Micro centrifuge tubes

B.1.12 Timer

B.1.13 Agarose gel electrophoresis tank

B.1.14 Analytical balance

B.1.15 Microwave

B.1.16 Casting trays and combs

B.1.17 -20°C freezers

B.1.18 -80°C ultra-freezer

B.2 Reagents

B.2.1 PCR consumables

B.2.2 DNA extraction kit (QIA prep spin mini prep form Qiagen, DNeasy Blood and tissue kit from Qiagen and Smart Helix First DNA id from Exvivon) are recommended

B.2.3 PCR kit (New England bio labs and bioline are recommend kits for convectional PCR

B.2.4 Agarose powder

B.2.5 Absolute ethanol

B.2.6 Nuclease free water

B.2.7 Primers for goat, cow, sheep, camel, buffalo and the expected source of the dairy animal to mixed with the goat's milk. (Primers should target the 12S rRNA region)

B.2.8 Molecular marker (depends on the expected band size of the amplicon)

B.2.9 TAE buffer (1X)

B.2.10 Gel Red dye

B.3 Procedure

Design primers or commercially acquire them for goat , cow ,sheep , camel, buffalo and any other dairy animal species you expect its milk to be mixed with the goat milk,. The designed primer should target the mitochondrial cytochrome b gene (12S rRNA). The DNA extraction is done from milk samples following the extraction protocol from the above mentioned recommended DNA extraction kits. The PCR reaction mixture is set up following the PCR mini protocol that comes along with PCR kit. The reaction mixture is then transferred to the PCR machine (thermal cycler) and the conditions are set following the conditions on the PCR kit protocol. After the PCR, the amplicons are then loaded on the agarose gel stained with gel Red of a known percentage and placed in the gel electrophoresis tank containing 1X TAE (Tris Acetate EDTA) buffer and the tank is set at 100V, 300MA for 1 hour. Then the gel is then transferred to the gel documentation machine to visualise the bands of interest using the UV light lamp fixed in the gel documentation machine. The presence of the expected band size of goat only qualifies the purity and quality of the goat's milk. But the presence of other expected band size of other dairy milk animals signifies the presence of other dairy milk from other species of dairy animal and this disqualifies the purity and quality of the goat's milk.

Bibliography

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ICS 67.100.10

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