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## **EAST AFRICAN STANDARD**

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**Fermented (cultured) milk — Specification**

**EAST AFRICAN COMMUNITY**

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## Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 017, *Milk and milk products*.

This second edition cancels and replaces the first edition (EAS 1008: 2021), which has been technically revised

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## Fermented (cultured) milk — Specification

### 1 Scope

This Draft East African Standard specifies the requirements, sampling and test methods for fermented (cultured) milk for human consumption.

This standard does not apply to yoghurt covered in EAS 33.

### 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.

CXC 57, *Code of hygienic practice for milk and milk products*

CXS 192, *General standard for food additives*

EAS 104, *Alcoholic beverages — Methods of sampling and test*

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

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

EAS 803, *Nutrition labelling — Requirements*

EAS 804, *Claims on foods — General requirements*

EAS 805, *Use of nutrition and health claims — Requirements*

ISO 11290-1, *Microbiology of the food chain — Horizontal method for the detection and enumeration of *Listeria monocytogenes* and of *Listeria* spp. — Part 1: Detection method*

ISO 13580, *Yoghurt — Determination of total solids content (Reference method)*

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

ISO 17792, *Milk, milk products and mesophilic starter cultures—Enumeration of citrate-fermenting lactic acid bacteria—Colony-count technique at 25 degrees C*

ISO 22662, *Milk and milk products—Determination of lactose content by high-performance liquid chromatography (Reference method)*

ISO 23318, *Milk, dried milk products and cream—Determination of fat content—Gravimetric method*

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

ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp.* ISO 6611, *Milk and milk products — Enumeration of colony-forming units of yeasts and/or moulds — Colony-count technique at 25 degrees C*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

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

ISO 8968-1, *Milk and milk products—Determination of nitrogen content—Part 1: Kjeldahl principle and crude protein calculation*

ISO/TS 11869, *Fermented milks — Determination of titratable acidity — Potentiometric method*

ISO/TS 6733, *Milk and milk products — Determination of lead content — Graphite furnace atomic absorption spectrometric method*

### 3 Terms and definitions

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

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>

**3.1 fermented (cultured) milk**  
milk product prepared from one or combination of the following; whole milk, partially or skimmed milk, concentrated milk, reconstituted milk, buttermilk, which are pasteurised or sterilized and fermented by means of specific mesophilic micro-organisms resulting in reduction of pH with or without coagulation

**3.2 plain (natural) fermented milk**  
milk fermented using appropriate cultures without addition of any other ingredients

**3.3 flavoured fermented milk**  
fermented milk into which permitted flavours and/or sweeteners, food colours have been added

**3.4 stirred fermented milk**  
plain or flavoured fermented milk whose coagulum has been broken through stirring or agitation process to obtain a free flowing product

**3.5 set fermented milk**  
plain or flavoured fermented milk whose coagulum has not undergone any stirring or agitation process

**3.6 Lactose free fermented milk**  
fermented milk whose lactose content has been significantly reduced using appropriate methods

**3.7 Drinks based on Fermented Milk**  
Composite milk products obtained by mixing fermented Milk with potable water with or without the addition of other ingredients such as whey, other non-dairy ingredients, and flavourings.

### 3.8

#### **foreign matter**

any kind of undesirable physical material introduced to a food product at any point in its production, handling, processing or distribution

## **4 Categories of fermented (cultured) milk**

The categories based on fat content shall be as follows:

- a) fermented whole milk;
- b) fermented low fat milk;
- c) fat reduced fermented milk;
- d) fermented fat free milk; and
- e) fermented high fat milk.

## **5 Types of fermented (cultured) milk**

fermented milk as presented in the form of either set, stirred or any other appropriate form may be classified in either of the following types:

- a) Plain/natural fermented milk;
- b) flavoured fermented milk;
- c) lactose-free fermented milk; and
- d) Drinks based on Fermented Milk.

## **6 Requirements**

### **6.1 Raw materials**

One or combination of the following raw materials shall be used:

- a) Whole milk,
- b) partially skimmed milk
- c) or skimmed milk,
- d) concentrated milk,
- e) buttermilk,
- f) reconstituted milk,
- g) recombined milk,
- h) toned milk,

- i) cream

## 6.2 Essential ingredients

### 6.2.1 Starter cultures

The starter culture used in the making of fermented milk products with their corresponding fermentation products levels are given in Table 1. Titratable acidity and ethanol shall be tested in accordance with ISO/TS 11869 and EAS 104 respectively.

**Table 1 — Designation, starter cultures and elements of fermentation**

| S/No   | Designation         | Culture   | Titratable acidity, expressed as % lactic acid, (% m/m)<br>min. | Ethanol (% vol/w)<br>min. |
|--|---------------------|---|---|---------------------------|
| i.   | Fermented milk      | The following can be used to manufacture fermented milk separately or in combination:<br><i>Streptococcus lactis</i><br><i>Streptococcus diacetylactis</i><br><i>Streptococcus cremoris</i><br><i>Leuconostoc citrovorum</i><br><i>Leuconostoc dextranicum</i><br><i>Streptococcus thermophilus</i>   | 0.3   | -                         |
| ii.  | Cultured buttermilk | <i>Streptococcus lactis</i><br><i>Streptococcus diacetolactis</i><br><i>Streptococcus cremoris</i><br><i>Leuconostoc citrovacuum</i><br><i>Leuconostoc dextranicum</i>  | 0.6   | -                         |
| iii.   | Kefir               | Starter culture prepared from kefir grains, <i>Lactobacillus kefir</i> , species of the genera <i>Leuconostoc</i> , <i>Lactococcus</i> and <i>Acetobacter</i> growing in a strong specific relationship. Kefir grains constitute both lactose fermenting yeasts ( <i>Kluyveromyces marxianus</i> ) and non-lactose-fermenting yeasts ( <i>Saccharomyces unisporus</i> , <i>Saccharomyces cerevisiae</i> and <i>Saccharomyces exiguus</i> ). | 0.6   | -                         |
| iv.  | Kumys               | <i>Lactobacillus delbrueckii</i> subsp. <i>Bulgaricus</i> and <i>Kluyveromyces marxianus</i>  | 0.7   | 0.5                       |
| <p>Note: Specific starter cultures of harmless micro-organisms shall be used. Other harmless microorganisms than those constituting the specific culture(s) may be added. Those microorganisms shall be viable, active and abundant in the finished products at the time of sale for consumption. If the product is heat treated after fermentation the requirement for viable microorganisms does not apply</p> |                     |   |   |                           |

## 6.3 Optional ingredients

The following optional ingredients complying with relevant standards may be used:

- a) sodium chloride;
- b) non-dairy ingredients such as nutritive and non-nutritive sweeteners, fruits and vegetables as well as juices, purees, pulps, preparations and preserves derived there from, cereals, honey, chocolate, nuts, coffee, spices and other harmless natural flavouring foods may be added and shall not exceed 50 % m/m;
- c) potable water in drinks based on fermented milk (Drinks Based on Fermented Milk contain a minimum of 40% (m/m) fermented milk);

#### 6.4 General requirements

Fermented (cultured) milk shall:

- a) be free from off flavours and off odours such as metallic and yeast flavour; and
- b) have the characteristic texture and taste of the type of fermented (cultured) milk.
- c) Be free from foreign matter other than declared ingredients
- d) not whey off

#### 6.5 Specific requirements

Fermented (cultured) milk shall comply with the specific requirements given in Table 2 when tested in accordance with the test methods specified therein.

**Table 2 — Specific requirements for fermented (cultured) milk**

| S/No | Characteristic  | Requirement          |                            |                        |                         |                         | Test method |
|------|---|----------------------|----------------------------|------------------------|-------------------------|-------------------------|-------------|
|      |   | Fermented whole milk | Fat reduced fermented milk | Fermented low fat milk | Fermented fat free milk | Fermented high fat milk |             |
| i.   | Milk fat content, %, m/m  | 3.25 – 4.5           | 1.51 – 3.24                | 0.5 – 1.50             | < 0.5                   | 4.6 – 10                | ISO 23318   |
| ii.  | Milk solids non-fat, %, m/m, min.   | 8.5                  | 8.5                        | 8.5                    | 8.5                     | 8.5                     | ISO 13580   |
| iii. | pH  | 4.0 – 4.6            | 4.0 – 4.6                  | 4.0 – 4.6              | 4.0 – 4.6               | 4.0 – 4.6               | Annex A     |
| iv.  | Sum of microorganisms constituting the starter culture (Bacteria in fermented milk derived from starter culture), CFU/g in total <sup>a</sup> min | 10 <sup>7</sup>      | 10 <sup>7</sup>            | 10 <sup>7</sup>        | 10 <sup>7</sup>         | 10 <sup>7</sup>         | ISO 17792   |
| v.   | Labelled microorganisms cfu/g in total <sup>b</sup> min   | 10 <sup>6</sup>      | 10 <sup>6</sup>            | 10 <sup>6</sup>        | 10 <sup>6</sup>         | 10 <sup>6</sup>         |             |
| vi.  | Milk protein %minimum   | 2.7                  | 2.7                        | 2.7                    | 2.7                     | 2.7                     | ISO 8968-1  |

| S/No  | Characteristic                            | Requirement          |                            |                        |                         |                         | Test method              |
|---|---|----------------------|----------------------------|------------------------|-------------------------|-------------------------|--------------------------|
|   |   | Fermented whole milk | Fat reduced fermented milk | Fermented low fat milk | Fermented fat free milk | Fermented high fat milk |                          |
| vii.  | [Lactose content <sup>c</sup> .% m/m max] | [0.1]                | [0.1]                      | [0.1]                  | [0.1]                   | [0.1]                   | ISO22662/<br>AOAC 984.15 |
| <p><sup>a</sup> The requirement on sum of microorganisms and labelled microorganisms do not apply for heat treated fermented milk.</p> <p><sup>b</sup> Applies where a content claim is made in the labelling that refers to the presence of a specific microorganism (other than those specified in Table 1 for the product concerned) that has been added as a supplement to the specific starter culture. This parameter does not apply to Kumys and Kefir.</p> <p><sup>c</sup> Lactose content applies to lactose free fermented milk</p> |   |                      |                            |                        |                         |                         |                          |

## 7 Food additives

Food additives permitted for fermented milk products in CXS 192 may be used.

## 8 Hygiene

Fermented (cultured) milk shall be prepared in accordance with EAS 39 and CXC 57.

## 9 Microbiological limits

Fermented (cultured) milk shall comply with the microbiological limits given in Table 3, when tested in accordance with the test methods specified therein.

**Table 3 — Microbiological limits for fermented (cultured) milk**

| S/No   | Microorganism                                 | Maximum limit   | Test method |
|--|---|-----------------|-------------|
| i.   | Coliforms, CFU/g, max.                        | < 10            | ISO 4832    |
| ii.  | <i>Salmonella spp.</i> , in 25 g, max.        | Absent          | ISO 6579-1  |
| iii.   | <i>Staphylococcus aureus</i> , CFU/g, max.    | <10             | ISO 6888-1  |
| iv.  | Yeasts and moulds <sup>a</sup> , CFU/ g, max. | 10 <sup>2</sup> | ISO 6611    |
| <sup>a</sup> For both kefir and kumys, the Yeast and moulds specification shall be 10 <sup>4</sup> CFU/g minimum |   |                 |             |

**Note:** <10 CFU/g should be interpreted as equivalent to “absent” based on the limit of detection for the method applied

## 10 Contaminants

### 10.1 Pesticide residues

Fermented (cultured) milk shall comply with the maximum limits of pesticide residues as specified by the Codex Alimentarius Commission.

## 10.2 Veterinary drugs residues

fermented (cultured) milk shall comply with the maximum limits for antibiotics and other veterinary drugs set by the Codex Alimentarius Commission in CX/MRL2.

## 10.3 Heavy metals

The level of lead (Pb) shall not exceed 0.02 mg/kg when tested in accordance with ISO/TS 6733.

## 10.4 Aflatoxins

When tested in accordance with ISO 14501, the level of aflatoxin M<sub>1</sub> shall not exceed 0.5µg/kg.

## 11 Packaging

Fermented (cultured) milk shall be packaged in food grade packaging material that safeguards the quality, integrity and safety of the product

## 12 Labelling

### 12.1 General labelling requirements

In addition to the requirements given in EAS 38, each package shall be legibly and indelibly labelled with the following:

- a) Name of the product shall either be “fermented milk” or “cultured buttermilk” or “kefir” or “kumys”.

Note: In addition to the requirement of 12.1.a (NAME), any other local/common name of the product such as bongo, Ikivuguto, mursik, mtindi, Rob, makamo may be added.

- b) Type either “plain/natural” or “flavoured” or “lactose free” or “drinks based on fermented milk”
- c) Category based on fat content as either whole or low fat or fat reduced or fat free or high fat
- d) Fat content
- e) **[Declaration of lactose content for lactose free fermented milk]**

### 12.2 Nutrition labelling and claims

Nutrition labelling shall be done in accordance with EAS 803. Nutrition and health claims may be used in accordance with EAS 804 and or EAS 805 as appropriate.

## 13 Sampling

Sampling of fermented (cultured) milk shall be done in accordance with ISO 707.

## **Annex A** (normative)

### **Determination of pH**

#### **A.1 General**

The pH value or hydrogen ion concentration gives a measure of the true acidity of fermented milk. The relationship between pH and acidity of yoghurt is only approximate. In fermented milk the pH ranges from 4.0 to 4.6. The value is reduced by the development of acidity. The pH of fermented milk may be determined rapidly by using the indicator strips.

#### **A.2 Indicator strips**

Indicator paper strips or discs are made by soaking strips of absorbent paper in a suitable indicator and drying them.

A rough estimate of pH is obtained by dipping a strip of the prepared paper in fermented milk and observing the colour. Bromocresol purple (pH range from 4 to 7, colour changes from yellow to purple) and bromothymol blue (pH range from 4 to 7, colour changes from straw yellow to bluish-green) are commonly used as indicators. Both narrow and wide range ready-made indicator papers are available over the pH range 2.0 to 10.5.

Indicator paper strips shall always be kept in closed containers and under dry conditions.

#### **A.3 pH meter**

The pH meter may be used to determine pH in fermented milk.

#### **A.4 Interpretation**

On an average, fermented milk gives a pH of 4.6. Fermented milk of pH over 4.6 should be regarded with suspicion as indication of poor fermentation as a result of starter culture inhibition. pH below 4.0 is as a result of over fermentation.

## Bibliography

- 1) EAS 1008: 2021 Fermented (cultured) milk — Specification (First edition)

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