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DRAFT EAST AFRICAN STANDARD

Yoghurt — Specification

EAST AFRICAN COMMUNITY

Second Edition 2018

Copyright notice

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.*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

This second edition cancels and replaces the first edition (EAS 33: 2007), which has been technically revised.

Yoghurt — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for yoghurt.

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

CAC/RCP 1, *General principles for food hygiene*

CAC/RCP 57, *Code of hygienic practice for milk and milk products*

CODEX STAN 192, *Codex general standard for food additives*

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

EAS 69, *Pasteurised milk — Specification*

EAS 803, *Nutrition labelling — Requirements*

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

ISO 2446, *Milk — Determination of fat content*

ISO 3728, Ice-cream and milk ice — Determination of total solids content (Reference method)

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

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*

ISO 7889, *Yoghurt — Enumeration of characteristic microorganisms — Colony count technique at 37 degrees C*

ISO 5764, *Milk — determination of freezing point — Thermistor cryoscope method (Reference method)*

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

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*

ISO 8968-4, *Milk and milk products — Determination of nitrogen content — Part 4: Determination of protein and non-protein nitrogen content and true protein content calculation (Reference method)*

ISO 11866-2, *Milk and milk products — Enumeration of presumptive Escherichia coli — Part 1: Most probable number technique using 4-methylumbelliferyl-beta-D-glucuronide (MUG)*

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

3 Terms and definitions

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

3.1
yoghurt
cultured milk product obtained by lactic acid fermentation through the action of Lactobacillus bulgaricus and Streptococcus thermophiles

3.2
coagulated milk
product obtained by lactic acid fermentation through the action *Lactobacillus bulgaricus* and *Streptococcus thermophillus* and other suitable bacteria of milk products which have been pasteurized prior to fermentation

3.3
sugar
any carbohydrate sweetening matter

3.4
sweetened yoghurt
yoghurt to which one or more sugars only have been added

3.5
plain yoghurt
yoghurt to which no sugar and food additives have been added

3.6
flavoured yoghurt
yoghurt to which flavouring foods or other flavouring ingredients have been added

3.7
fruit yoghurt
yoghurt to which fruits have been added

3.8
probiotic yoghurt
yoghurt which contains in addition to yoghurt starter culture (S. thermophilus and L. delbrueckii subsp. bulgaricus.) live lactic acid bacteria which when administered in adequate amounts confer a health benefit to the host

3.9
greek yoghurt
yoghurt that has been strained to remove its whey resulting to a thicker and creamy consistency

3.10
heat-treated yoghurt
yoghurt that has been pasteurised, thermized or sterilized

3.10.1
pasteurized yoghurt
yoghurt which has been subjected to pasteurization process after fermentation

NOTE *See* EAS 69

3.10.2
thermized yoghurt
yogurt that is heat-treated at 62 °C to 65 °C for 15 to 20 sec aimed at reducing the number of viable organisms and prolonging shelf-life

3.10.3
sterilized yoghurt
yoghurt that is heat-treated at a minimum of 115 °C for 15 sec aimed at attaining commercial sterility and prolonged shelf-life.

4 Requirements

4.1 Types of yoghurt

There are various types of yoghurt including but not limited to:

a) plain yoghurt;

b) flavoured yoghurt;

c) heat treated yoghurt;

d) probiotic yoghurt; and

e) greek yoghurt

4.2 Ingredients

4.2.1 Essential ingredients

All yoghurts shall be made from any of the following milk and milk products and essential ingredients:

a) pasteurized milk whole or skimmed;

b) evaporated or condensed milk, whole or skimmed;

c) pasteurized cream;

d) a mixture of two or more products; and

e) cultures of *Lactobacillus bulgaricus* and *Streptococcus thermophillus*.

4.2.2 Optional ingredients

4.2.2.1 Ingredients, including but not limited to the following, may be added to all types of yoghurts:

a) cultures of suitable lactic acid producing bacteria;

b) milk powder whole or skimmed;

c) unfermented butter milk;

d) concentrated whey;

e) whey or whey proteins and/or their concentrates;

f) edible casein; and caseinates;

g) sugars (in sweetened types of yoghurt only), complying with CODEX STAN 212; or

h) flavouring agents, nutritive and non nutritive sweeteners, fruits, vegetables as well as juices, purees, pulps and preparations and preserves derived theirfrom, cereals, honey, chocolate, nuts, coffee, spices and other harmless natural flavouring foods and/or flavours.

4.2.2.2 Where non dairy ingredients are used, they shall not be more than 50 % of the total composition.

4.3 General requirements

Yoghurt shall:

a) be free from off flavours and off odours such as metallic flavour or yeast flavour;

b) be free from foreign matter; and

c) have the characteristic texture and taste of the type of yoghurt.

4.4 Specific requirements for yoghurt

Yoghurt shall comply with the requirements specified in Table 1 when tested in accordance with test methods specified therein.

Table 1 — Specific requirements for yoghurt

S/N	Characteristic	Whole Yoghurt	Low fat yoghurt	Skimmed Yoghurt	High fat yoghurt	Test method
i.	Milk fat content, %, m/m	3.25 - 4.5	0.5 - 3.24	< 0.5	4.6 - 15	ISO 2446
ii.	Milk Solids Not Fat, %, m/m, min.	8.5	8.5	8.5	8.5	ISO 6731
iii.	pH	4.2 - 4.6	4.2 - 4.6	4.2 - 4.6	4.2 - 4.6	Annex A
iv.	Titratable acidity, %, lactic acid, min.	0.6 - 1.0	0.6 - 1.0	0.6 - 1.0	0.6 - 1.0	Annex B
v.	*Sum of microorganisms constituting the starter culture* CFU/g in total	10^7	10^7	10^7	10^7	ISO 7889
vi.	*Labelled microorganisms* CFU/g in total*	10^6	10^6	10^6	10^6	
NOTE 1 The requirement on *Sum of microorganisms* and *Labelled microorganisms* do not apply for heat treated yoghurt						
*Applies where a content cream is made in the labelling that refers to the presence of a specific microorganism other than *Lactobacillus Bulgaricus* and *Streptococcus Thermophillus* that has been added as supplement to the specific starter culture						

4.5 Microbiological limits

Yoghurt shall comply with microbiological limits in Table 2 when tested in accordance with test methods specified therein.

Table 2 — Microbiological limits for yoghurt

S/N	Micro organisms	Maximum limits	Test method
i.	*E. Coli, CFU/ g*	Absent	ISO 11866-2
ii.	*Salmonella spp in 25g*	Absent	ISO 6579-1
iii.	*Staphylococcus aureus*, perg	Absent	ISO 6888-3
iv.	*Moulds and yeasts*, *CFU/ g*	10	ISO 6611

5 Food additives

Food additives which may be used shall comply with CODEX STAN 192.

6 Hygiene

Yoghurt shall be produced and handled in accordance with CAC/RCP 57 and CAC/RCP 1.

7 Contaminants

7.1 Pesticide residues

Yoghurt shall conform to maximum limits residues set by Codex Alimentarius Commission.

7.2 Veterinary drugs residues

Yoghurt shall conform to maximum tolerable residue limits for antibiotics and other veterinary drugs set by Codex Alimentarius Commission.

7.3 Heavy metals

The level of Lead (Pb) shall not exceed 0.02 mg/kg when tested in accordance with AOAC 999.10.

7.4 Mycotoxin

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

8 Packaging

8.1 Yoghurt shall be packaged in food grade materials that are non-toxic and inert to yoghurt.

8.2 The packaging material or containers shall be well sealed to protect the contents during storage.

9 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 “yoghurt” by type and/or category of fat content;

b) net content in SI units;

c) name and physical address of manufacturer;

d) batch or code number;

e) nutritional information;

f) the date of manufacture and expiry date;

g) instruction for storage and use;

h) declaration of allergens if any; and

i) country of origin.

10 Sampling

Sampling of yoghurt shall be done in accordance with ISO 707.

Annex A
(informative)

Determination of pH

A.1 General

The pH value or hydrogen ion concentration gives a measure of the true acidity of milk. The relationship between pH and acidity of milk is only approximate. In normal cow milk the pH ranges from 6.6 to 6.8. The value is reduced by the development of acidity. On the other hand, the pH value of milk from a cow suffering from mastitis is alkaline in reaction, the value being over 7.0. The pH test is mainly used for the detection of abnormal mastitis in milk. The pH of 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 milk and observing the colour. Bromocresol purple (pH range 5.2 to 6.8 colour changes from yellow to purple) and bromothymol blue (pH range 6.0 to 7.6 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 glass bottles and under dry conditions.

A.3 Interpretation

In normal milk the pH is well below 6.9. On an average, cow milk gives a pH of 6.6. Milk of pH over 6.9 should be regarded with suspicion as indication of some diseases of the udder or of late lactation milk.

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

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 = $\frac{9V.M}{m}$

Where,

V=is the volume in ml of the standard sodium hydroxide required for titration (see B.3.1)

M=is the molarity of the standard sodium hydroxide solution (see B.3), and

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

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.3.2.1),

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

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

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.

