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EAST AFRICAN STANDARD

Food grade meat (beef) extract — Specification

EAST AFRICAN COMMUNITY

Foreword

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

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. 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 procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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.

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Introduction

Meat extract is a by-product and is widely used as a food item. It is usually prepared as a concentrated product by the evaporation, under vacuum, of aqueous extract, produced by cooking cattle meat including buffaloes in water.

In the preparation of this East African Standard, the following sources were consulted extensively:

IS 11748:1986(R2000), *Specification for Meat Extract (Beef), Food Grade*

CKS 139:2009, *Meat extract*

KS 1168:1996, *Specification for beef extract*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/pestdes/jsp/pest_q-e.jsp

USDA Foreign Agricultural Service website: <http://www.mrldatabase.com>

USDA Agricultural Marketing Service website: <http://www.ams.usda.gov/AMSV1.0/Standards>

USDA Plant Inspectorate Service website: http://www.aphis.usda.gov/import_export/plants

European Union: http://ec.europa.eu/sanco_pesticides/public

Assistance derived from these sources is hereby acknowledged.

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Food grade meat (beef) extract — Specification

1 Scope

This East African Standard specifies the requirements and methods of sampling and test for food grade meat extract (beef).

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.

AOAC Official Method 931.06:1931, *Phosphorus (Total) (P_2O_5) in Eggs*

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

CD-K-683:2010, *Smoked bacon — Specification*

CD/K/700:2010, *Ante-mortem and post-mortem inspection of meat animals — Code of practice*

EAS 5, *Refined white sugar — Specification*

EAS 12, *Drinking (potable water) — Specification*

EAS 35, *Edible salt — Specification*

EAS 38, *Labelling of prepackaged foods — Specification*

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

EAS 41, *Fruits, vegetables and derived products — Sampling and methods of test*

EAS 103, *Schedule for permitted food additives*

EAS 123, *Distilled water — Specification*

ISO 936, *Meat and meat products — Determination of total ash*

ISO 937, *Meat and meat products — Determination of nitrogen content (Reference method)*

ISO 1442, *Meat and meat products — Determination of moisture content (Reference method)*

ISO 1443, *Meat and meat products — Determination of total fat content*

ISO 1444, *Meat and meat products — Determination of free fat content*

ISO 1736, *Dried milk and dried milk products — Determination of fat content — Gravimetric method (Reference method)*

ISO 1737, *Evaporated milk and sweetened condensed milk — Determination of fat content — Gravimetric method (Reference method)*

ISO 1841-1, *Meat and meat products — Determination of chloride content — Part 1: Volhard method*

- ISO 1841-2, *Meat and meat products — Determination of chloride content — Part 2: Potentiometric method*
- ISO 2294, *Meat and meat products — Determination of total phosphorus content (Reference method)*
- ISO 2917, *Meat and meat products — Measurement of pH — Reference method*
- ISO 2918, *Meat and meat products — Determination of nitrite content (Reference method)*
- ISO 3091, *Meat and meat products — Determination of nitrate content (Reference method)*
- ISO 3496, *Meat and meat products — Determination of hydroxyproline content*
- ISO 4134, *Meat and meat products — Determination of L-(+)- glutamic acid content — Reference method*
- ISO 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique*
- ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*
- ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*
- ISO 5537, *Dried milk — Determination of moisture content (Reference method)*
- ISO 5553, *Meat and meat products — Detection of polyphosphates*
- ISO 5554, *Meat products — Determination of starch content (Reference method)*
- ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*
- ISO 6491, *Animal feeding stuffs — Determination of phosphorus content — Spectrometric method*
- ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*
- ISO 8156, *Dried milk and dried milk products — Determination of insolubility index*
- ISO 9390, *Water quality — Determination of borate — Spectrometric method using azomethine-H*
- ISO 13493, *Meat and meat products — Determination of chloramphenicol content — Method using liquid chromatography*
- ISO 13496, *Meat and meat products — Detection of colouring agents — Method using thin-layer chromatography*
- ISO 13730, *Meat and meat products — Determination of total phosphorus content — Spectrometric method*
- ISO 13965, *Meat and meat products — Determination of starch and glucose contents — Enzymatic method*
- ISO 21527-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 1: Colony count technique in products with water activity greater than 0.95*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

3 Definitions

For the purposes of this specification the following definitions shall apply:

acceptable

acceptable to the authority administering this specification, or to the parties concluding the purchase contract, as relevant

meat extract

product obtained by the extraction of fresh meat with boiling water, and the concentration of the extract by evaporation after the removal of fat

4 Requirements

4.1 Raw materials

4.1.1 The meat used in cooking shall be fresh chilled to below 7°C or may have been stored for a maximum period of 180 days at a temperature below -18°C.

4.1.2 The meat used shall be firm, have fine texture and good colour. The yellow connective tissue, gristle and sinew in amounts naturally associated with the flesh may be used.

4.2 Preparation

4.2.1 The product shall be prepared by filtering and concentrating the extracts to the specified limit of total solid, after it has been manually and mechanically freed from excess of fat.

4.2.2 No preservative, additives, artificial colouring or flavouring matter shall be used.

4.3 Requirements of finished product

4.3.1 Physical

The material shall comply with the requirements specified in 4.3.1.1 to 4.3.1.3. In general, product shall have a smooth spreadable consistency. It shall be free from lumps and burnt or foreign flavour.

4.3.1.1 The texture of the product shall be short that is not stringy.

4.3.1.2 The consistency shall be firm.

4.3.1.3 3 g of material dissolved in 300 ml, of boiling water in a white porcelain beaker, when allowed to cool to 55-60°C shall:

- a) be clear;
- b) be light brown to brown in colour;
- c) have a characteristic beefy odour with no abnormal taint; and
- d) have a characteristic beefy taste, free from bitterness, scorching, acidity, gluyness, astringency and off-flavours.

4.3.2 Chemical

The material shall also comply with the requirements specified in Table 1.

Table 1 — Chemical requirements for food grade meat extract (beef)

S/No.	Characteristic	Requirement	Method of test
	Total solids, % by mass, min.	80.0	ISO 751
	Matter insoluble in water and ether, % by mass, Max	2.0	Annex A
	Ash, %, max.	27	ISO 936
	Salt (NaCl), % by mass, max.	5.0	Annex B
	Fat, % by mass, max.	0.5	ISO 1443
	Nitrogen, % by mass, min.	8.0	ISO 937
	Creatine and creatinine (as creatinine), % by mass, min.	7.0	Annex C
	Copper, ppm, Max	10.0	EAS 41
	Tin, ppm, Max	250.0	EAS 41
	Lead, ppm, Max	2.0	EAS 41
	Zinc, ppm, Max	50.0	EAS 41
	Arsenic, ppm, Max	1.0	EAS 41

4.3.3 Microbiological requirements

When tested in accordance with an internationally accepted method, the product shall comply with the requirements in Table 2.

Table 2 — Microbiological requirements of food grade meat extract (beef)

S/No.	Characteristic	Requirement	Method of test
(1)	(2)	(3)	(4)
a)	Total colony count per gram (determined by incubation at 37 °C for 48 h on nutrient agar), max.	100 000	
b)	<i>Salmonella</i> organisms	Absent	
c)	<i>Faecal streptococci</i>	Absent	
d)	<i>Escherichia coli</i>	Absent	
e)	<i>Clostridium perfringens</i>	Absent	
f)	<i>Staphylococci</i> /g, Max	100	
g)	Sulfite-reducing clostridia, per g, max.	100	
h)	Yeast and mould, per gram, Max	50	

5 Hygienic requirements

5.1 The material shall be prepared and handled under strict hygienic conditions by persons free from contagious and infectious diseases and only in premises maintained in a thoroughly clean and hygienic conditions and having adequate and safe water supply (EAS 39) and duly approved and licenced/monitored by the concerned public health authorities. All workers shall use clean and washed white clothings. Necessary precautions shall be taken to prevent incidental contamination of the product from soiled equipment or from personnel suffering from injuries.

5.2 All equipment coming in contact with raw material or products in the course of manufacture shall be kept clean. An ample supply of steam and water hoses, brushes and other equipment necessary for proper cleaning of machinery and equipment shall be available. The equipment may be sterilized by immersion in or swabbing with hypochlorite or other suitable chlorine solution having 200 ppm available chlorine or by steam.

5.3 Quality of water used for processing shall conform EAS 12.

6 Sampling

6.1 Representative samples of the material shall be drawn as follows.

6.1.1 For Physical analysis — 20 g of sample shall be taken from one container of the day's production.

6.1.2 For chemical analysis — 10 g of sample shall be taken from each container of the day's production. If this totals less than 50 g, then a proportionately larger sample shall be taken from each container, to total a minimum of 50 g.

6.1.3 For bacteriological analysis — 10 g shall be taken aseptically from each container of the day's production.

7 Tests

7.1 Test shall be conducted as specified in Table 1 and Table 2 respectively.

7.2 Quality of reagents — Unless specified otherwise, pure chemicals and distilled water (see EAS 123) shall be employed in the tests.

NOTE Pure chemicals shall mean chemicals that do not contain impurities which affect the test results.

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Annex A
(normative)

Method for determination of matter insoluble in water and ether

A.1 Weigh about 2.0 g of sample into a 250 ml beaker. Add 125 ml of hot distilled water. Dissolve the sample completely and keep for boiling on a hot plate. Continue boiling for one minute. Filter through dried, weighed filter paper No. 54. Give 2-3 washings with hot water. Dry the filter paper in an oven at a temperature 105 C for 2 hours. Transfer the dried paper into a desiccator, cool and weigh.

A.2 Calculation

Matter insoluble in water and ether, percent by mass = $\frac{\text{Mass of residue}}{\text{Mass of sample}} \times [100 - \text{percentage of fat}]$

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Annex B
(normative)

Determination of sodium chloride

B.1 Reagents

B.1.1 Standard Silver Solution — 0.1 N, standardized against 0.1 N sodium chloride solution.

B.1.2 Dilute Nitric Acid — 1:4.

B.1.3 Ferric Ammonium Indicator Solution — A saturated solution of ferric alum $\text{Fe}(\text{NH}_4)(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$.

B.1.4 Standard potassium thiocyanate solution — 0.1N

B.2 Procedure

B.2.1 Take 0.3 g to 0.5 g of the dried products in a 250-ml Erlenmeyer flask. Add a known volume of the standard silver nitrate solution in quantity more than sufficient to precipitate all the chloride as silver chloride and then add 20 ml of dilute nitric acid. Boil on a hot plate or sand bath until the solids, except silver chloride, dissolve. Cool and add 50 ml of water and 5 ml of the ferric ammonium indicator solution and titrate against the standard potassium thiocyanate solution until a permanent light brown colour appears.

B.3 Calculation

B.3.1 Sodium chloride, per cent by weight

$$= 5.85 \frac{(V_1 N_1 - V_2 N_2)}{W}$$

where,

V_1 = volume of the standard silver nitrate solution;

V_2 = volume of the standard potassium thiocyanate;

N_1 = normality of the standard silver nitrate solution;

N_2 = normality of the standard potassium thiocyanate; and

W = weight, in g, of the dried product taken for the test.

Annex C
(normative)**Determination of creatine in meat****C.1 Preparation of Solution**

Exhaust 7-25 g sample (depending upon H₂O content) as follows: Weigh into 150 mL beaker, add 5-10 mL cold (15°) NH₃-free H₂O, and stir to homogeneous paste. Add 50 mL cold H₂O, stir at 3 min intervals during 15 min, let stand 2-3 min, and decant liq. thru quant. filter, collecting filtrate in 500 mL vol. flask. Drain beaker, pressing out liq. from meat residue with glass rod. Add 50 mL cold Hp to residue in beaker, stir 5 min, let stand 2-3 min, and decant as before. If much meat is transferred to filter, return it to beaker with glass rod. Repeat extns, using two 50 mL portions and four 25 mL portions cold H₂O. After last extn, transfer entire insol. portion to filter and wash with three 10 mL portions H₂O, letting material drain thoroughly after each addn. Dil. to vol. and mix thoroly.

Measure 150 mL ext into 250 mL beaker and evap. to 40 mL on steam bath, stirring occasionally. Neutze to phthln, using indicator outside the soln. Add 1 mL 0.1N HOAc and boil gently 5 min. (Coagulum should sep. at once, leaving clear liq.) Filter thru quant. paper, wash beaker thoroughly 4 times with hot H₂O, wash coagulum on filter 3 times, and discard coagulum.

C.2 Determination

Evap. filtrate and washings, 24.043, to 5-10 mL, transfer with min. amt hot HP to 50 mL vol. flask, keeping vol. < 30 mL, add 10 mL 2N HC 1, and mix. Hydrolyze 20 min in autoclave at 117-120°, let cool somewhat, and chill under running H₂O. Partially neutze excess acid by adding 7.5 mL 10% NaOH soln (CO₃-free), dil. to vol., and mix.

Make preliminary reading after carrying thru reaction on 20 mL with Duboscq colorimeter to det. vol. needed to obtain reading of ca 8 mm. Transfer such vol. 500 mL vol. flask and add 10 mL 10% NaOH soln and 30 mL *std* (J.2%) *picric acid soln*. Mix, rotate 30 sec, and let stand exactly 4.5 min. Dil. to vol. at once with H₂O, shake thoroly, and compare, preferably in Duboscq colorimeter, with *std soln* prepd by treating with NaOH and picric acid, and dilg to 500 mL as above, 50 mL of soln contg 1.603 g *creatinine Zn chloride* in 1 L 0.1N HCl (1 mL = 0.001 g creatinine; g creatinine x 1.16 = g creatine.)

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