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DRAFT EAST AFRICAN STANDARD

Pasta products — Specification

EAST AFRICAN COMMUNITY

2023

Second Edition

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.

In order to achieve this objective, the Community established an East African Standards Committee mandatedto develop and issue East African Standards.

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 proceduresof the Community.

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

Pasta is a very generic term used to describe a commonly consumed food group which encompasses noodles, spaghetti, macaroni and similar commodities.

These products have gained a fast popularity in catering and home uses. The manufacturing process for macaroni or spaghetti consists of the dough preparation from wheat and cold or lukewarm water, kneading process and extrusion through the extrusion press fitted with a die for the desired shape.

The extruded products are cut to a given length and then dried to definite moisture content under controlled conditions of temperature and humidity.

Rice, cassava or legumes flour such as beans or lentils, are sometimes used in place of wheat flour to yield different tastes and textures, or as gluten-free alternative

Pasta products — Specification

1 Scope

This Draft East African Standard specifies the requirements sampling and test methods for pasta products derived from wheat flour (*Triticum Durum, Triticum Aestivum, Triticum Compactum*) or any other suitable flour intended for human consumption.

This standard applies to the following pasta products such as macaroni, spaghetti, Vermicelli, noodles, short-cut pasta, lasagna, fortified pasta and similar products

2.0 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.

ISO 6633, Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method

AOAC 952.13, Arsenic in food. Silver diethyldithiocarbamate

EAS 1, Wheat flour - specification

Codex Stan 192, *General standard for food additives*

CODEX STAN 193*, Codex General Standard for Contaminants and Toxins in Food and Feed*

EAS 38, *General standard for the labelling of pre-packaged foods*

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

EAS 900, Cereals and Pulses - Sampling

EAS 901, Cereals and Pulses – Test methods

ISO 6579-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection ofSalmonella spp.*

ISO 16649-2, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli — Part 2: Colony-count technique at 44 degrees C using 5-bromo-4-chloro-3-indolyl beta-D-glucuronide

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 activityless than or equal to 0.95

3.0 Terms and Definitions
For the purposes of this standard, the following terms and definitions shall apply

3.1
pasta
type of food typically made from an unleavened dough of wheat flour or any other suitable flour mixed with water with or without addition eggs, and formed into different shapes.

3.2
macaroni
variety of pasta traditionally shaped into narrow tubes produced in various shapes and sizes.

3.3
spaghetti
long, thin, cylindrical, solid pasta products

3.4
vermicelli
traditional type of pasta similar but thinner than spaghetti

3.5
noodles
types of pasta in the form of solid rods or folded ribbons.

3.6
egg noodle
narrow strip of pasta with addition of eggs

3.7
fortified pasta
Pasta products to which micronutrients have been added.

3.8
lasagna
rectangular or ribbon shaped, thicker than tagliatelle, made from a dough based on flour and eggs, with numerous local variants.

4.0 Product description

4.1 Macaroni
They may be of two types, namely long macaroni or cut macaroni, with the following characteristics: follows:

a) Long macaroni shall be in the form of tubular rods, smooth or corrugated. They shall have the outer diameter ranging between 2.5 mm and 7 mm and of wall thickness of about 1 mm with tolerance of ± 0.1 mm..

b) Cut-macaroni shall be obtained by extrusion and may be in the form of tubular elbows, shells, alphabets, numerals, stars, wheels, rings, rice, melon seeds etc.

4.2 Spaghetti
Spaghetti shall be in the form of solid rods of a minimum length of 250 mm and minimum diameter of 1.6 mm with tolerance of ± 0.1 mm.

4.3 Vermicelli
Vermicelli shall be in the form of solid rods of diameter between 250 mm and of diameter between 0.5 mm to 1.25 mm.

4.4 Folded vermicelli
They shall be in the form of folded rods of diameter between 0.5 mm to 1.25 mm.

4.5 Noodles
They shall be in the form of solid rods of minimum length 250 mm and diameter between 1.25 mm and 2.0 mm or ribbons of width from 1.5 mm to 15 mm and thickness ranging from 1.25 mm to 1.0 mm

4.6 Folded noodles
These shall be in the form of folded ribbons of thickness ranging from 1.25 mm to 2.0 mm.

4.7 Short-cut pasta
these shall be products of various defined forms such as shells, stars, squares etc.

4.8 Lasagne
These shall be square or rectangular shaped pasta

4.9 Egg pasta
Special type pasta contain eggs vegetable products and the final products shall have the appearance of the characteristic added material such as yellow for egg pasta and green for spinach pasta.

The egg macaroni, egg spaghetti, egg noodles or egg alimentary pasta shall contain not less than 4% egg yolk solids when tested in accordance with Annex G. The egg yolk solids shall be derived from whole egg, frozen egg yolk.

5.0 Requirements

5.1 Ingredients
5.1.1 Essential Ingredients

The following ingredients shall be used in the manufacture of pasta products and shall conform to the relevant East African Standards:

a) durum semolina/ wheat flour or any other suitable flour;
b) Water; and
c) Egg (only in the case of egg pasta).

5.1.2 Optional ingredients

In addition to the essential ingredients specified under 5.1.1, any of the following ingredients may be used in the manufacturer of pasta products in singly or in combination:

a) Milk;
b) Soya flour;
c) Vegetable or vegetable products;
d) Spices;
e) Gluten;
f) Edible oilseeds flour;
g) Edible common salt;
h) Fruit or fruit products (preserved, dehydrated or pulp); and
i) Rice.

5.2 General requirements

Pasta products shall

a) be smooth, translucent, hard brittle and up to a point elastic and when brokenthe fracture shall appear glassy.

b) possess a characteristic color and flavor

c) be clean, sound, wholesome, and practically free from rodent or insect infestation

d) retain their shapes and show no sign of disintegration and shall swell appreciably when plunged into vigorously boiling water and boiled in accordance with the time declared by the manufacture for each variety of the product.

e) When cooked, pasta product shall retain its shape and a certain firmness and develop a clear characteristic odour of hard wheat and shall not become pasty.

5.3 Specific requirements

Pasta products shall also comply with the specific requirements given in Table 1.

Table 1 —Specific requirements for pasta products

S/No	Characteristics	Requirements	Methods of test (Annex)
1	Total ash (on dry basis) % by mass, *max*.	1.0	B
2	Acid insoluble ash (on dry basis) % bymass, *max*.	0.2	C
3	Total protein (N x 5.7) on dry basis) %by mass,min.	8.0	ISO 20483
4	Cooking test: Total solids in gruel, %by mass, *max*.	10	E
5	Fat Acidity,(mg NaOH/ 100g), max	4	ISO 7305
6	Moisture content, % m/m max.	12	A

6. Hygiene

6.1 Pasta products shall be produced and handled in accordance with EAS 39.

6.2 The products shall comply with the microbiological limits given in Table 2 when tested in accordance with the methods specified therein

Table 2: Microbiological Limits for pasta products

S/N	Microorganisms	Requirement	Test method
2	Escherichia coli, cfu/g	Absent (<10)	ISO 16649-2
3	Salmonella (/25g)	Absent	ISO 6579-1
4	Yeast and Moulds, per g, max	10^2	ISO 21527-2
5	*Staphylococcus aureus,* CFU/g	Absent	ISO 6888-1

7.0 Food Additives

Only the food additives permitted by Codex Stan 192 in the manufacture of pasta products may be used without exceeding the limits.

8.0 Contaminants

8.1 Heavy contaminants

Pasta products shall conform to those maximum levels as per Codex Stan 193

8.2 Mycotoxins

Pasta products shall comply with the maximum limits for mycotoxin given in Table 3 when tested according to the test methods specified therein.

Table 3: Mycotoxin limits for Pasta Products

SNo	Contaminants	Limits	Test Method
1	Aflatoxin B1, µg/ kg	5.0	EAS 901
2	Total aflatoxins, µg/ kg	10.0	EAS 901

9 Sampling

Pasta products shall be sampled in accordance to the EAS 900

10 Packaging

Pasta products shall be packaged in food grade packaging material, which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

11 Labelling

The following specific labelling requirements shall apply and shall be legibly and indelibly marked in accordance with the requirements of EAS 38.name of product in relation to the product description given in Clause 4;

a) the word “fortified” placed in brackets, below the name of the product and the details of enrichment and quantities added, if enriched with vitamins and or minerals;
b) the word “spiced” on the label, if spices have been added;
c) declaration on the label if egg has been added;
d) declaration of all ingredients on the label in descending order of proportions;
e) name, physical location and address of manufacturer
f) net content in metric units
g) date of manufacture;
h) batch number;
i) best before;
j) country of origin and
k) cooking/ use instructions;
l) allergen declaration, if any and.
m) instruction for the disposal of packaging materials.

Annex A
(normative)

Determination of moisture

A.1 Apparatus and equipment
A. 1.1 Moisture dish
A.1. 2 Air oven capable of maintaining 105 °C ± 2 °C for five hours
A.1.3 Analytical balance capable of weighing to an accuracy of ± 0,01 g.
A.1.4 Mortar and pestle or grinder
A. 1.5 425 micro sieve
A.1. 6 Desiccator

A.2 Procedure

A.2.1 Preparation of sample — Grind in pestle and mortar about 30 g of the material so that at least 90 % passes through 425 micro sieve. Transfer this prepared sample to a well-stoppered glass bottle for use as indicated in A.1.2 and D.3.1.

A.2.2 Weigh accurately about 5 g of the prepared sample in a suitable moisture dish made of porcelain, silica or platinum, previously dried in an air-oven maintained and weighed. Place the dish in air-oven maintained at 105 °C ± 2 °C for five hours. Cool the dish in a desiccator and weigh the dish with the lid on. Heat again at 105 °C ± 2 °C in the air-oven for 30 min cooling and weighing till the difference between two successive weighings is less than one milligram. Note the lowest mass.

NOTE The dish containing the dried material for the determination of ash should be preserved (see B.1).

A.3 Calculation

$$\text{Moisture, \% by mass} = \frac{100(M1 - M2)}{M1 - M}$$

where

M_1 is the mass in g of the dish with the material before drying,

M is the mass in g of the empty dish, and

M_2 is the mass in g of the dish with the material after drying.

Annex B
(normative)

Determination of total ash

B.1 Apparatus and equipment
B.1.1 Furnace capable of maintaining temperature at 600 °C ± 20 °C
B.1.2 Crussible
B.1.3 Analytical balance capable of weighing to an accuracy of ± 0,01 g.
B. 1. 4 Desiccator

B.2 Procedure

Ignite the dried material (see A.1.2**)** in the dish with flame of suitable burner for about one hour till the material is completely charred. Complete the ashing by keeping in muffle furnace at 600 °C ± 20 °C until grey ash results. Cool in desiccator and weigh. Repeat the process of heating for 30 min cooling and weighing till the difference in mass between the two successive weighings is less than one milligram. Note the lowest mass.

NOTE The dish containing this ash for the determination of acid insoluble ash should be preserved (see C.2).

B.3 Calculation

$$\text{Total ash (on dry basis), \% by mass} = \frac{100(M_1 - M_2)}{M_1 - M}$$

where

M_2 is the mass in g of the dish with the ash,

M is the mass in g of the empty dish, and

M_1 is the mass in g of the dish with the dried material (see M_2 in A.2).

Annex C
(normative)

Determination of acid insoluble ash

C.1 Apparatus and equipment
C.1.1 Furnace capable of maintaining temperature at at 600 °C ± 20 °C
C.1.2 Crussible
C.1.3 Analytical balance capable of weighing to an accuracy of ± 0,01 g.
C. 1. 4 Desiccator
C.1.5 Whatman filter paper No 42

C.2 Reagents

Dilute hydrochloric acid — approximately 5 N prepared by diluting concentrated hydrochloric acid with distilled water

C.3 Procedure

To the ash contained in the dish (see B.1.1) add 25 ml of dilute hydrochloric acid, cover with watch- glass and heat on water-bath for 10 min. Allow to cool, filter the contents for the dish throughWhatman filter paper No 42 or its equivalent. Wash the filter paper until the washings are free from the acid and return it to the dish. Keep it in an air-oven maintained at 105 °C ± 2°C for about three hours. With the flame of a suitable burner complete the ashing in a muffle furnace at 600 °C ± 20 °C for one hour. Cool the dish in a desiccator and weigh. Heat again at 600°C ± 20°C in the muffle furnace for 30 min. Cool the dish in the desiccator and weigh. Repeat the process of heating for 30 min, cooling and weighing till the difference in mass between the successive weighings is less than one milligram. Note the lowest mass.

C.4 Calculation

$$\text{Acid insoluble ash (on dry basis), \% by mass} = \frac{100(M_2 - M_1)}{M_1 - M}$$

where,

M_2 is the mass in g of the dish with acid insoluble ash,

M is the mass in g of the empty dish, and

M_1 is the mass in g of the dish with the dried material (see M_2 in A.2).

Annex D
(normative)

Determination of total solids in gruel

D.1 Apparatus

D.1.1 Lipless beaker — tall-form, of capacity 500 mL

D.1.2 Oil bath

D.1.3 Electric heater

D.2 Procedure

Take 250 ml water in the lipless beaker and heat over an oil bath kept at about 102 °C by electric heating. Introduce exactly 25 g of the pasta product (previously) broken into 10 mm lengths in case of long pasta products and cook at a constant temperature of about 98 °C at sea level with occasional stirring.

NOTE The cooking time required by this apparatus is on an average two minutes more than that recommended on the package (i.e. more than that required with free boiling water). The cooked pasta should be allowed to drain for five minutes and the volume of gruel collected measured. Pipette out 20 ml of the gruel, after stirring well to a tarred petri dish and evaporate to dryness on a water-bath. Transfer the petri dish and evaporate to dryness on a water-bath. Transfer the petri dish to a hot air-oven maintained at 105 °C ± 2 °C and dry to constant mass.

D.3 Calculation

$$\text{Total solids in gruel \% by mass} = \frac{(M_2 - M_1)V}{5}$$

where,

M_2 is the mass in g of petri dish with total solids per cent in 20 mL of gruel,

M_1 is the mass in g of empty petri dish, and

V is the volume of gruel in ml.

Annex E
(normative)
Determination of crude fibre content

E.1 Preparation of sample

Break the pasta product into small fragments with hands or in mill, and mix well. Grind 300 g to 500 g in mill until all material passes through No 20 sieve. Keep ground sample in sealed container to prevent moisture changes.

E.2 Reagents

E.1.1 Sulphuric acid solution — 0.255 N ± 0.005 N 1.25 % H_2SO_4/100 ml. The concentration shallbe checked by titration.

E.1.2 Sodium hydroxide solution — 0.313 N ± 0.005 N 1.25 % NaOH/100 ml, free or nearly so from Na_2CO_3. The concentration shall be checked by titration.

E.1.3 Prepared asbestos — spread a thin layer of acid washed, medium or long fibre asbestos in evaporation dish and heat for 16 h at 600 °C in furnace. Boil 30 min with 1.25 % H_2SO_4, filter, wash thoroughly with water, and boil for 30 min with 1.25 % H_2SO_4, filter, wash thoroughly with water, and boil for 30 min with 1.25 % NaOH. Filter, wash once with 1.25 %, H_2SO_4, wash thoroughly with water, dry and ignite for 2 h at 600 °C.

Determine blank by treating 1.0 g prepared asbestos with acid and alkali. Correct crude fibre results of any blank, which should be negligible (about 1 g). Asbestos recovered from the determination may be used in subsequent determinations.

E.1.4 Alcohol — 95 % or reagent MeOH or isopropanol

E.1.5 Antifoam compound A — Dilute (1 + 4) with mineral spirits or pot ether, or water, dilute antifoam B emulsion (1 + 4). Do not use antifoam spray.

E.1.6 Bumping ships or granules — Broken alumdum crucibles or equivalent granule are satisfactory.

E.2 Apparatus

E.2.1 Digestion apparatus — with condenser to fit 600 mL beaker, and hot plate adjustable to temperature so that it will bring 200 mL water at 25 °C to rolling boil 15 min ± 2 min

E.2.2 Ashing dishes — silica, vireosil 70 mm x 15 mm; or porcelain, coors, No 450, size 1 or equivalent

E.2.3 Desiccator — with efficient desiccator such as 4 to 5 mesh drierite ($CaCl_2$ is not satisfactory)

E.2.4 Filtering device — with No 200 type 304 or 316 stainless steel screen easily washed free ofdigested residue, use any suitable filter funnel. for example, Buchner filter funnel

E.2.5 Suction filter — to accommodate filtering devices. Attach suction flask to trap in line withaspirator or other source of vacuum with valve to break vacuum.

E.2.6 Liquid preheater — for preheating water, 1.25 % H_2SO_4 and 1.25 % NaOH solution to boilingpoint of H_2O

E.3 Procedure

Extra 2 g of ground material ether or pot ether. Transfer to 600 ml beaker avoiding fibre contaminationfrom paper or brush. Add about 1 g of prepared asbestos, 200 ml boiling 1.25 %, H_2SO_4 and 1 drop diluted antifoam. (Excess antifoam may give results, use only if necessary to control foaming.) Bumping chips of granules may also be added. Place beaker on digestion apparatus with pre- adjusted hot plate and boil exactly 30 min rotating the beaker periodically to keep solids from adhering to sides. Remove beaker and any suitable filter funnel.

In treating the residue, dry mat and residue for 2 h at 130 °C ± 2 °C, cool in desiccator and weigh. Ignite for 30 min at 600 °C ± 15 °C. Cool in desiccator and reweigh.

E.4 Calculation

$$\% \text{ crude fibre in ground sample - } C = \frac{(\text{Loss in weight on ignition} - \text{loss in weight of asbestos blank}}{\text{Weight of sample}} \times 100)$$

Report results to 0.1 %.

Annex F
(normative)

Degree of acidity of raw pasta

F.1 Procedure

Weigh 4 g of milled raw pasta into an Erlenmeyer flask and carefully suspend 100 ml of neutralized 50 vol. % ethanol. Stopper the flask to avoid solvent loss and leave for one hour at room temperature. The contents should be whirled by hand four times during this period. At the end, agitate the suspensions vigorously, clear by centrifuging (3 min at 300 rvm) or filtration (funnel sitting directly on the neck of another Erlenmeyer flask and flute paper filter (15 cm) covered with petri dish, both measures to avoid solvent losses). The suspension is to be filtered in total and also 100 mL 50 vol. % neutralized ethanol are to be filtered in the same way to be used as a blank (to compensate for any absorption on the filter paper). To 50 ml of the cleared-extract and 50 ml of the filtered blank (in case of centrifuging no blank is necessary), three drops of 1 % phenolphthalein in ethanol are added. These aliquots are titrated with 0.1 N NaOH from a burette with 0.02 mL graduation until the first reddish tint appears and remains visible for at least 10 s (change in colour from greenish yellow to reddish yellow in sample extracts).

F.2 Calculation

Acidity degree (pasta dry matter) = $\frac{(n - no)\ x\ 5\ x\ 100}{100 - m}$

where,

n is the ml 0.1 N NaOH for 50 mL extract,

n_o is the ml 0.1 N for 50 ml blank,

m is the moisture content of raw pasta.

Annex G
(normative)
Determination of egg yolk solids

G.1 Preparation of sample

Grind in pestle and mortar about 30 g of the material so that at least 90 % passes through 425 micro sieve. Transfer this prepared sample to a well-stoppered glass bottle for use.

G.2 Procedure

G.2.1 Reflux 100 g sample in a Soxhlet apparatus using 100 cm^3 pure methanol for two hours. Decant and add a further 100 cm^3 pure methanol fractions. Evaporate to dryness. Carry out a phosphorus determination as detailed below.

G.2.2 Phosphorus Determination — Weigh 0.05 g of sample into a platinum dish. Add 5 cm^3 of analytical grade chloroform. Add 8 cm^3 of 4 % alcoholic potash and evaporate to dryness in an oven held at 105 °C. Char using an Argand burner and then ash at dull red heat in a muffle furnace. When the dish has cooled, add 5 cm^3 concentrated hydrochloric acid and evaporate to dryness. Extract the residue with 10-cm^3 mL hydrochloric acid. Filter through a Whatman No 54 grade filter paper into a100 cm^3 graduated flask. Wash any residue well with hot distilled water. Neutralize with normal sodium hydroxide using phenolphthalein as indicator. Make to the mark with distilled water.

Take a sufficient volume by pipette of the prepared solution containing 5 mg to 5 mg phosphorus and transfer to a stout boiling tube.

The total volume should be 5 cm^3, if lower than this add distilled water. Add, by fast running pipette, 1 cm^3 10 M sulphuric acid 1 cm^3 2.5 % ammonium molybdate and 1 cm^3 20 % potassium iodide solution (containing 0.5 % sodium carbonate). Swirl stopper with a glass ball and hold in a boiling water bath for fifteen minutes. Remove and cool in an ice bath.

Add sufficient freshly prepared 0.5 % sodium sulphate to remove the iodine colour and to give a light excess. Transfer solution and make up to 50 cm^3 in a graduated flask (or smaller volume if found necessary). Measure the colour strength of the solution when held in a 1 cm glass cell using 14 and 608 filters on the Spekker Absorptiometer. Carry out a check on the Absorptionmeter using distilled water in the cell. Calculate the phosphorus content by reference to the reference curve for a standard phosphorus solution.

This solution can be prepared by dissolving 4.388 g analytical grade potassium dihydrogen phosphatein distilled water, adding 2 cm^3 in graduated flask. The solution contains 1 000 µg phosphorus/cm^3, lower concentrations can be obtained by dilution. For comparison purposes, in a series of tests 1 µg phosphorus/cm^3 gave a Spekker Absorptiometer of 0.285.

G.3 Calculation

Egg yolk solids = P_2O_5 x 56

Bibliography

EAS 173:2000 (first ed) Pasta products - Specification