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DRAFT EAST AFRICAN STANDARD

Fortified composite flour — Specification

EAST AFRICAN COMMUNITY

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Contents

Page

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 018, *Nutrition and foods for special dietary uses.*

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.

Fortified composite flour — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for fortified composite flour intended for human consumption.

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 952.13, *Arsenic in food. Silver diethyldithiocarbamate*

AOAC 953.17, *Thiamine (vitamin B1) in grain products. Fluor*

AOAC 970.65, *Riboflavin(Vitamin B2) in Foods and Vitamin Pr*

AOAC 975.41, *Niacin and Niacinamide in Cereal Products*

AOAC 961.15, *Method modification for liquid chromatographic determination of thiamine, riboflavin, and pyridoxine in medical foods.*

AOAC 2004.05, *Total Folates in Cereal*

AOAC 2001.13, Determination of Vitamins A (Retinol) and E (alpha-Tocopherol) in Foods by Liquid Chromatography: Collaborative Study

CODEX STAN 192, *General standard for food additives*

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

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

EAS 744, *Cassava and cassava products — Determination of total cyanogens — Enzymatic assay method*

EAS 782, *Composite flour—Specification*

EAS 900, *Cereals and pulses — Sampling*

EAS 901, *Cereals and pulses — Test methods*

EAS 803*, Nutrition labelling — Requirements*

EAS 804, *Claims on foods — Requirements*

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

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 feedstuffs — 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*

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 5498, *Agricultural food products — Determination of crude fibre content — General method*

ISO 5506, *Soya bean products — Determination of urease activity*

ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

ISO 6561-1, *Fruits, vegetables and derived products — Determination of cadmium content — Part 1: Method using graphite furnace atomic absorption spectrometry*

ISO 6561-2, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

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

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 7305, *Milled cereal products — Determination of fat acidity*

ISO 9648, *Sorghum — Determination of tannin content*

ISO 20634, Infant formula and adult nutritionals — Determination of vitamin B12 by reversed phase high performance liquid chromatography (RP-HPLC)

3 Terms and definitions

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

3.1
composite flour
product obtained by blending of flour prepared from food plants and/or their products. It may also be obtained by blending grains/seeds before milling

3.2
fortified composite flour
composite flour to which essential micronutrients have been added

3.3
diluent
suitable, inert, edible food-grade carrier for micronutrients

3.4
fortification premix
blend of fortificants and diluents formulated to provide specified and determinable amounts of micronutrients

3.5
fortificant
compound which contains essential micronutrient intended to be added to a food

3.6
food fortification
practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health

3.7
wholesome
free from disease and physiological deterioration (such as but not limited to decay, breakdown, freezing damage) or adulteration/contamination, that appreciably affects their appearance, edibility, the keeping quality of the produce or market value

3.8
practically free
without visible defects matter that is consistent with good manufacturing and handling practices employed in the production, distribution and the point of use of the fortified composite flour

3.9
foreign matter
organic and inorganic material other than composite flour

3.10
food grade packaging material
material which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product

3.11
filth
impurities of animal origin including dead insects

4 Requirements

4.1 Raw materials

4.1.1 Fortified composite flour shall be prepared from composite flour complying with EAS 782 and fortification premix complying with DEAS 1023.

4.1.2 The food plants or their products from which the flour is milled shall be clean, wholesome and practically free from foreign matter. The raw materials including animal source of proteins shall comply with relevant East African Standards.

4.1.3 Legumes used as ingredients for fortified composite flour shall be pre-treated before milling or compositing and shall comply with relevant East African Standards.

4.2 General requirements

Fortified composite flour shall be:

a) free from foreign matter;

b) free from off flavours and off-odours;

c) practically free from any living insects and filth;

d) wholesome and fit for human consumption; and

e) composed of cereals and or legumes with the least contributing at least 10 %.

4.3 Specific requirements

4.3.1 Fortified composite flour shall comply with the limits given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific requirements for fortified composite flour

S/N	Characteristic	Requirement	Test method
1.	Moisture Content, %, by mass, max.	14	EAS 901
2.	Crude fibre content, max.%, m/m	5.0	ISO 5498
3.	Acid insoluble ash on moisture free basis, % m/m, max.	0.40	ISO 5985
4.	Fat acidity on moisture free basis, mg KOH/100 g, max.	80	ISO 7305

4.3.2 If cassava is used as a component of the fortified composite flour, the total hydrocyanic acid content of fortified composite flour shall not exceed 10 mg/kg, when tested using EAS 744.

4.3.3 If soya flour is used as a component of the fortified composite flour, urease activity in the fortified composite flour shall not exceed 0.3 mg N/g/min (for trypsin inhibitor activity, 5 mg/g) when tested in accordance with ISO 5506

4.3.4 If sorghum flour is used as a component of the fortified composite flour, the tannin content of the fortified composite flour shall not exceed 0.3 % by mass on a dry matter basis when tested in accordance with ISO 9648.

5 Optional ingredients

The following optional ingredients may also be used in preparation of the product and shall comply with relevant standards:

a) protein concentrates and other high protein ingredients suitable for consumption by target population;

b) milk and milk products;

c) eggs;

d) meat;

e) sugars (only nutritive carbohydrate sweeteners);

f) starchy roots (such as arrow roots, yam or cassava); and

g) fish.

6 Fortification requirements

6.1 Levels of micronutrients

Fortified composite flour shall comply with the levels of micronutrients provided in Table 2 when tested in accordance with test methods specified therein.

Table 2 — Requirements for levels of micronutrients in fortified composite flour

Nutrient	Fortificant	Limits mg/kg		Test method
		Min.	Max.	
Vitamin A	Vitamin A (Retinyl) palmitate, spray-dried or equivalent, 75 000 µg RE/g[a] (7.5 % retinol), min.	0.5	1.4	AOAC 2001.13
Vitamin B1	Thiamin Mononitrate, 81 %, min.	3.0	NA[b]	AOAC 953.17
Vitamin B2	Riboflavin, 100 %, min.	2	NA	AOAC 970.65
Niacina	Niacinamide, 99 %, min.	14.9	NA	AOAC 975.41
Vitamin B6	Pyridoxine hydrochloride, 82 %, min.	2	NA	AOAC 961.15
Folate	Folic acid, 90.5 %, min.	0.6	1.7	AOAC 2004.05
Vitamin B12	Vitamin B12 (Water soluble), 0.1 %,min.	0.007	NA	ISO 20634
Zinc	Zinc oxide, 80 %, min.	33	65	AOAC 2011.14
Total iron	Total iron	21	NA	AOAC 944.02

NOTE Any other fortificants listed by either British Pharmacopoeia (BP); Food Chemical Codex (FCC); Merck Index (MI); United States National Formulary (NF); European Pharmacopoeia (Ph Eur); United States Pharmacopoeia (USP); or FAO WHO Codex Alimentarius Commission may be used.

[a] 1µg RE = 3.33 IU, RE = Retinol equivalent

[b] NA-Not Applicable. The maximum limits for these nutrients are not necessary because the upper tolerance limits of these nutrients are very high.

6.2 Fortification premixes

Fortification premixes to be used shall comply with DEAS 1023.

7 Food additives

7.1 Fortified composite flour may contain food additives in accordance with CODEX STAN 192.

7.2 Azordicarbonamide (ADA) and potassium bromate shall not be used.

8 Hygiene

8.1 Fortified composite flour shall be produced, prepared and handled in accordance with EAS 39.

8.2 Fortified composite flour shall not exceed microbiological limits given in Table 3 when tested in accordance with the test methods specified therein.

Table 3 — Microbiological limits for fortified composite flour

S/N	Microorganism	Limit	Test method
i	Total aerobic count cfu/ g, max.	10^5	ISO 4833-1
ii	*Escherichia coli* cfu/g, max.	$<1x10^2$	ISO 16649-2
iii	*Salmonella spp* per 25 g	Absent	ISO 6579-1
iv	Yeast and moulds cfu/g, max.	10^4	ISO 21527-2
v	*Staphylococcus aureus, cfu/g,* max.	10^2	ISO 6888-1

9 Contaminants

9.1 Pesticide residues

Fortified composite flour shall comply with the maximum pesticide residue limits established by Codex Alimentarius Commission for this commodity.

9.2 Heavy metals

Fortified composite flour shall comply with the heavy metal limits given in Table 3 when tested in accordance with test methods specified therein.

Table 3 — Heavy metal limits for fortified composite flour

S/N	Heavy metal	Maximum limit mg/kg	Test method
1.	Arsenic (As)	0.1	AOAC 952.13
2.	Lead (Pb)	0.2	ISO 6633
3.	Cadmium (Cd).	0.1	ISO 6561-1 ISO 6561-2

9.3 Mycotoxins

Fortified composite flour shall comply with the mycotoxin limits given in Table 4 when tested in accordance with test methods specified therein.

Table 4 — Mycotoxin limits for fortified composite flour

S/N	Mycotoxin	Maximum limit µg/kg	Test method
1.	Total aflatoxins	10	EAS 901
2.	Aflatoxin B1	5	
3.	Fumunisins	2 000	

10 Weights and measures

Fortified composite flour shall be packaged in accordance with the weights and measures regulations of the destination country.

11 Packaging

Fortified composite flour shall be packaged in food grade material to safeguard the safety, hygienic, nutritional and organoleptic qualities of the product.

12 Labelling

12.1 General labelling

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

a) common name of product as “Fortified composite flour”;

b) name and address of the manufacturer/packer/importer;

c) brand name and/or registered trade mark;

d) date of manufacture;

e) list of ingredients;

f) lot or batch number in code or in clear format;

g) net weight in metric units;

h) the declaration “Human Food’’;

i) expiry date;

j) country of origin;

k) instructions for use;

l) storage instruction as “Store in a cool dry place away from any contaminants”;

m) instructions on disposal of used package;

n) a statement declaring the recommended age/group; and

o) Where the product contains an ingredient known to cause allergy, it shall have the words, ‘contains xx which may cause allergy.

12.1.2 When labelling non-retail packages, information for non-retail packages shall either be given on the packages or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the package.

12.2 Nutrition labelling

The nutritional composition in the fortified composite flour shall be declared on the label in accordance with EAS 803.

12.3 Nutrition and health claims

Where permitted by national legislation, fortified composite flour may have claims on the importance of the added nutrients in nutrition and health. Such claims when declared shall be in compliance with EAS 804 and EAS 805.

13 Sampling

Sampling shall be done in accordance with EAS 900.