



DEAS 1126-1: 2023

ICS 67.230

EAST AFRICAN STANDARD

Fortified Processed Cereal Based Foods (FPCBF) —Specification —Part
1: For persons of 6 to 59 months

EAST AFRICAN COMMUNITY

Copyright notice

This EAC document is copyright-protected by EAC. While the reproduction of this document by participants in the EAC standards development process is permitted without prior permission from EAC, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from EAC.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to EAC's member body in the country of the requester:

© East African Community 2023 — All rights reserved
East African Community
P.O. Box 1096,
Arusha
Tanzania
Tel: + 255 27 2162100
Fax: + 255 27 2162190
E-mail: eac@eachq.org
Web: www.eac-quality.net

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

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.

DEAS 1126 consists of the following parts, under the general title *Fortified Processed Cereal Based Foods (FPCBF) — Specification*

- *Part 1: for persons of 6 to 59 months*
- *Part 2 : for persons of 5 years and above*

Introduction

An individual needs approximately different nutrients, in different amounts, in order to grow, develop and remain healthy. This is reflected in the established Recommended Nutrient Intakes (RNI) established by the World Health Organization for individuals of different age, sex, activity level and physiological state. Meeting the nutrient requirements of an infant and a young child requires consumption of an adequately diverse diet, including breast milk and a variety of plant source foods (vegetables, fruits, staples), animal source foods (dairy, eggs, fish, meat) as well as fortified foods.

Inappropriate execution of recommended complementary feeding practices can be attributed in large part to the difficulty of acquiring the recommended quality and quantity of foods. Vitamin-rich fruits and vegetables are often available only during certain seasons, making year round consumption challenging. Animal source foods, an important source of fat and bio-available protein, are either unavailable or expensive for inclusion in most households daily consumption patterns. Most rural households suffer from chronic food insecurity, making it difficult to feed children in sufficient quantities and frequencies.

Staple foods produced and consumed in rural households are not screened for common toxins, which may be contributing to poor nutritional outcomes. Contaminants such as aflatoxins can be carcinogenic and cause growth retardation, and high levels of aflatoxins in human diets are associated with stunting in young children. Food processing can use state of the art technology to detect aflatoxins in raw materials like maize, in order to ensure that they do not contaminate the food products, but this level of processing is inaccessible to the target populations.

Households need access to an affordable, high quality complementary food that provides the full suite of nutrients necessary for 6 months - 24 months old children, to fill all of the nutritional gaps left after breastfeeding, and to achieve healthy growth and development. Packaging the necessary nutrients into a single product eases administration for the mother and ensures that children are not vulnerable to seasonal and economic gaps in access to nutritious local foods. Considering the essential role of adequate nutrient intake by young children in the prevention of under-nutrition and its life-long consequences, and the fact that meeting nutrient requirements from the combination of breast milk and foods naturally rich in essential nutrients is very challenging for many households, which is to a large part due to availability and affordability constraints, and that many Rwandan households suffer from seasonal or yearlong food insecurity, the Ministry of Health has concluded that increasing accessibility of fortified complementary foods for children aged 6 months - 24 months is an important strategy to ensure a continuum of nutrition for Rwandan children essential to achieving lifelong potential.

Fortified Processed Cereal Based Foods (FPCBF) may include but not limited to the following categories:

- a) Fortified Processed Cereal Based Foods which are or have to be prepared for consumption with milk or other suitable liquids;
- b) Fortified Processed Cereal Based Foods with an added high protein food which are or have to be prepared for consumption with water or other suitable protein-free liquid;
- c) Products which are to be used after cooking in boiling water or other suitable liquids; and
- d) rusks and biscuits which are to be used either directly or, after pulverization, with the addition of water, milk or other suitable liquids.

Fortified Processed Cereal Based Foods (FPCBF) —Specification —Part 1: For persons of 6 to 59 months

1 Scope

This Draft East African standard specifies the requirements, sampling and test methods for Fortified Processed cereal based foods intended for persons from the age of 6 months up to 59 months.

This standard does not cover products covered by EAS 72.

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 2001.0, *Official method for the determination of Fumonisin B1 and B2 in corn and corn flakes*

AOAC 944.02, *Official method for the determination of Iron in flour, Spectrophotometric method*

AOAC 965.33, *Official method for the determination of Peroxide value*

AOAC 984.27, *Official method for the determination of calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium and zinc in infant formula*

AOAC 986.18, *Determination of Deoxynivalenol in wheat, gas chromatographic method*

AOAC 992.04, *Official method for the determination of Vitamin A in milk and milk infant formula*

AOAC 999.11, *Determination of Lead, Cadmium, Copper, Iron, and Zinc in Foods. Atomic Absorption Spectrophotometry*

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

CODEX STAN 73, *Standard for Canned Baby Foods*

CODEX STAN 74, *Standard for Processed Cereal-Based Foods for Infants and Young Children*

ISO 16958; *Milk, milk products, infant formula and adult nutritionals -- Determination of fatty acids composition –Capillary gas chromatographic method.*

CAC/GL 21, *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods*

CAC/GL 23, *Guidelines for Use of Nutrition and Health Claims*

CAC/RCP 1, *General Principles of Food Hygiene*

EAS 38, *Labeling of pre-packaged foods combined*

EAS 803, *Nutritional labeling — Requirements*

ISO 11085, *Cereals, cereals-based products and animal feeding stuffs —Determination of crude fat and total fat content by the Randall extraction method*

ISO 15141-1, *Foodstuffs —Determination of ochratoxin A in cereals and cereal products —Part 1: High performance liquid chromatographic method with silica gel clean up*

ISO 15214, *Microbiology of food and animal feeding stuffs —Horizontal method for the enumeration of mesophilic lactic acid bacteria —Colony-count technique at 30 degrees C*

ISO 16050, *Foodstuffs —Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products —High-performance liquid chromatographic method*

ISO 16649-1; *Microbiology of food and animal feeding stuffs —Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli —Part 1: Colony-count technique at 44 degrees C using membranes and 5-bromo-4-chloro-3-indolyl beta-D-glucuronide*

ISO 20483, *Cereals and pulses —Determination of the nitrogen content and calculation of the crude protein content —Kjeldahl method*

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*

ISO 2171, *Cereals, pulses and by-products —Determination of ash yield by incineration*

ISO 24333, *Cereals and cereal products —Sampling*

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

ISO 5498, *Agricultural food product —Determination of crude fiber content —General method*

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

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 712, *Cereals and cereal products —Determination of moisture content —Reference method*

ISO 7932, *Microbiology of food and animal feeding stuffs —Horizontal method for the enumeration of presumptive Bacillus cereus —Colony-count technique at 30 degrees C.*

ISO 16649-2, *Microbiology of food and animal feeding stuffs —Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia*

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

processed cereal based foods

food product prepared primarily from one or more milled cereals

3.2

Fortified Processed Cereal Based Foods (FPCBF)

processed cereal based foods to which micronutrients have been added specifically to provide additional nutrients which are either lacking or are present in insufficient quantities in the diet

3.3

fortification

practice of deliberately adding micronutrient(s) that is 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”

3.4

fortificant

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

3.5

micronutrient

natural or synthesized vitamin, mineral or a trace element that is essential for normal growth, development and maintenance of life and of which a deficiency will be detrimental to health

3.6

diluent

suitable, inert, edible food-grade carrier for micronutrients

3.7

fortification premix

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

3.8

extraneous matter

organic matter originating from food plants and/or their products other than the designated product

3.9

foreign matter

organic and inorganic materials (such as sand, soil, glass) other than extraneous matter in the designated product.

4 Raw materials

Fortified Processed cereal-based foods shall be prepared primarily from one or more milled cereal products, such as wheat, rice, barley, oats, rye, maize, millet, finger millet, bulrush millet, sorghum and buckwheat complying with the relevant East African Standards which shall constitute not less than 25 % of the final mixture on dry weights basis.

5 Optional ingredients

The following optional ingredients may be used and shall comply with relevant standards:

- a) pulses, legumes; and starchy roots;
- b) oil seed flours and oil seed protein products;
- c) animal source foods;
- d) fats and oils excluding partially hydrogenated fats and oils;
- e) free sugar such as sucrose, fructose, glucose, glucose syrup or honey can be added in cereals with an added high protein food which are or have to be prepared for consumption with water or other appropriate protein-free liquids:
 - 1) the amount of added carbohydrates from the above mentioned sources shall not exceed 5 g/100 kcal, and
 - 2) the amount of fructose shall not exceed 2.5 g/100 kcal.

5 Requirements

5.1 General requirements

FPCBF shall be:

- a) free from live insects;
- b) free from extraneous matter and foreign matter;
- c) have no rancid or musty odour or flavour;

5.2 Specific requirements

5.2.1 FPCBF shall comply with specific requirements specified in Table 1 when tested in accordance with test methods specified therein

Table 1 — Specific requirements for FPCBF

S/N	Parameters	Requirements	Test method
1.	Energy density (on dry weight basis), kcal/100 g, Min.	400	
2.	Fat content*, % m/m	9 - 18	ISO 11085
3.	Protein, % m/m	8 - 22	ISO 20483
4.	Acid insoluble ash, %, m/m on dry matter basis, max.	0.4	ISO 5985
5.	Moisture content ^a , %, by mass, max.	7.0	ISO 712
6.	Dietary fibre % (on a dry basis), by mass, max.	5	ISO 5498
7.	Peroxide Value, meq /kg fat, max.	10	AOAC 965.33
8.	Vitamin A; IU/100 g flour	2112-4200	AOAC 992.04
9.	Iron; mg/100 g flour	7.2-15	AOAC 944.02
10.	Calcium; mg/100 g flour	380-532	AOAC 984.27
11.	Potassium; mg/100 g flour	570-836	AOAC 984.27

^a The moisture content applies to dried form of products

*If the lipid content exceeds 3.3 g/100 kcal (29.7 % energy), the amount of linoleic acid (in the form of triglycerides) shall not be less than 300 mg/100 kcal and shall not exceed 1200 mg/100 kcal, the amount of lauric acid shall not exceed 15 % of the total lipid content and the amount of myristic acid shall not exceed 15 % of the total lipid content when tested in accordance with ISO 16958.

5.2.2 Additional requirements on product nutritional composition are provided in Annex A.

6 Fortification requirements

6.1 Fortificants

Fortificants for use shall be stable compounds conforming to specifications in any internationally recognized documents including not limited to the following:

- a) British Pharmacopoeia (BP);
- b) Food Chemical Codex (FCC);
- c) Merck Index (MI);
- d) United States National Formulary (NF);
- e) European Pharmacopoeia (Ph Eur);
- f) United States Pharmacopoeia (USP); or
- g) FAO/WHO Codex Alimentarius Commission (CAC).

6.2 Premix

The fortificants shall be mixed with diluents or carriers as appropriate to form a premix. Diluents or carriers shall conform to USP, BP, Ph Eur, NF, MI, FAO/WHO, or FCC requirements.

Vitamin Compounds and Mineral Salts Vitamins and minerals used in formulation of premix or added to the product shall be selected from the Advisory lists of nutrient compounds for use in foods for special dietary uses intended for infants and young children (CXG 10-1979).

7 Food additives

Only the food additives CODEX STAN 192 may be used in FPCBF to maximum limits given in those standards

8 Hygiene

8.1 Fortified processed Foods shall be produced, prepared and handled in accordance with the provisions of appropriate sections of EAS 39.

8.2 The product shall comply with microbiological limits in Table 2.

Table 2 — Limit of microorganisms in FPCBF

S/N	Microorganisms	Maximum levels		Test method
		Non-instant FPCBF	Instant FPCBF (ready to eat)	
1.	Total viable count CFU/ g, max.	10 000	500	ISO 4833
2.	Coliforms CFU/ g, max.	10	Absent	ISO 4832
3.	<i>Salmonella spp</i> in 25 g, max.	absent	Absent	ISO 6579-1
4.	<i>Escherichia Coli</i> CFU/ g, max.	Less than 10	Less than 10	ISO 16649-2
5.	<i>Staphylococcus aureus</i> CFU/g, max.	Less than 10	Less than 10	ISO 6888-1
6.	<i>Bacillus cereus</i> CFU/ g max.	absent	Absent	ISO 7932
7.	Yeasts and moulds CFU/ g, max.	100	100	ISO 21527-2
8.	<i>Clostridium perfringens</i> CFU/g max	absent	Absent	ISO 7937

9 Contaminants

9.1 Heavy metals

S/N	Heavy metal	Maximum limit (mg/kg)	Test method
i.	Lead	0.2	AOAC 999.11

ii.	cadmium	0.1	
-----	---------	-----	--

9.2 Pesticide residues

Fortified Processed cereal-based foods shall comply with the maximum residue limit established by the Codex Alimentarius Commission for this commodity.'

9.3 Natural occurring toxin and anti-nutrient factors

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

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

9.3.3 If cassava is used as a component of the FPCBF, the total hydrocyanic acid content shall not exceed 2 mg/kg, when tested in accordance with EAS 744.

9.4 Mycotoxins

FPCBF shall conform to those permissible mycotoxin limits established in Table 3.

Table 3 — Permissible mycotoxin limits

S/ N	Parameters	Limits	Methods of test
i.	Total aflatoxins (B1, B2, G1, and G2), µg/kg	5	RS ISO 16050
ii.	Aflatoxin B1, µg/kg	3	
iii.	Fumonisin, mg/kg	2	AOAC 2001.04
iv.	Ochratoxin A, µg/kg	5	RS ISO 15141-1
v.	Deoxynivalenol (DON), mg/kg	0.2	AOAC 986.18

10 Packaging

10.1 FPCBF shall be packaged in food grade, material; which will safeguard the hygienic and other quality of the product.

10.2 Each package shall be securely closed and easily re-closable during use.

11 Labelling

In addition to the requirements of EAS 38 and EAS 803, each package shall be legibly and indelibly marked with the following:

- name of the product as Fortified processed Cereal Based Food;
- type of fortificants;
- Statement "suitable for person with moderate acute malnutrition for the age of 6 to 59 months".
- a statement that this product is not breast-milk substitute ; and
- serving/dosage instruction

12 Methods of sampling

Sampling shall be done in accordance with the RS ISO 24333.

DEAS FOR PUBLIC REVIEW

Annex A
(normative)

Additional requirements on product composition

S/N	Vitamins and minerals	Product micronutrient content per 100 g	Test method
i.	Vitamin D µg	8-23	
ii.	Vitamin E mg (Alpha-Tocopherol), min	11.4	
iii.	Vitamin C mg, min	57	
iv.	Vitamin B1 (Thiamine) mg, min	0.4	
v.	Vitamin B2 (Riboflavin) mg,min	1.5	
vi.	Vitamin B3 (Niacin) mg NE,min	10	
vii.	Vitamin B6mg,min	0.8	
viii.	Folate DFE µg min	152	
ix.	Vitamin B12 µg min	1.9	
x.	Biotin µg min	8	
xi.	Pantothenic acid mg, min	2	
xii.	Vitamin K µg min	19	
xiii.	Copper 5 mg	0.4-1.3	
xiv.	Iodine µg	57-133	
xv.	Magnesium mg,min	106-160	
xvi.	Selenium, µg	13-34	
xvii.	Manganese ¹ mg	0.38-0.76	
xviii.	Sodium content mg,max	190	
xix.	Total zinc, mg	7.6-13	
1Industry to test for the intrinsic during the public review in order to find out the total one			

DEAS FOR PUBLIC REVIEW

Bibliography

- [1] ECSA, Manual of methods for determining micronutrients in fortified foods; www.a2zproject.org/2zorg/pdf/Manual_Foods.pdf
- [2] FAO/WHO (2004) Reference nutrient intake or INL 98 from FAO/WHO Vitamins and Mineral requirements in Human Nutrition. 2nd Edition. (for all micronutrients except copper, manganese and phosphorus)

DEAS FOR PUBLIC REVIEW

DEAS FOR PUBLIC REVIEW