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DRAFT EAST AFRICAN STANDARD

Fortified milled rice— 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. XXXXXX.

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.

Introduction

The Health Ministers of the East, Central and Southern Africa (ECSA) Health Community passed a resolution in 2002 directing the ECSA Secretariat to work with the countries to fortify commonly consumed foods in the region after recognizing the high levels of malnutrition in the region. Following initial promotion efforts, ECSA countries (Kenya, Uganda, Tanzania, Malawi, Zambia, Zimbabwe, Lesotho, Swaziland, Mauritius, and Seychelles) identified staple foods suitable for fortification as oil, sugar, maize meal/ flour and wheat flour in addition to existing iodization of salt. Considering the trade volumes within the EAC region and the need to facilitate trade within the region, the EAC Partner States in 2012 resolved to harmonise fortification standards resulting to publication of EAS 767 Fortified wheat flour, EAS 768 Fortified maize flour and EAS 769 fortified oils and fats standards in 2012 as well revising the existing standard EAS 35 on fortified edible salt.

Rice has become the second most important staple food in East African Community (EAC) region. The production of paddy rice and self- sufficiency varies across the EAC Partner States. Tanzania is the highest producer at 2,688,000 MT. Democratic Republic of Congo produces 1,580,620MT, Uganda 303,283MT, Kenya 192,299 MT and Burundi 120,000 MT. Statistics indicate that Tanzania is over 90% self- sufficient while Uganda is at 67%, and Kenya is at 19% sufficiency. Burundi, Democratic Republic of Congo, Rwanda, South Sudan, Tanzania, and Uganda import less than 330,000 MT of milled rice while Kenya imports about 700,000 MT annually. Tanzania is the highest contributor of the EAC common market. Rice imports from outside the region mainly comes from Asian Countries among them, Pakistan, Thailand, India, China, and Vietnam.

Consumption of rice in the region has reached 1.8 million MT per year with the trend expected to continue expanding each year to the foreseeable future. The current per capita consumption of rice is 28kg, 6.5kg, 28.6kg, 10.5kg, 10.4kg 5.6kgs for Kenya, Uganda, Tanzania, Rwanda, Democratic Republic of Congo and Burundi respectively. Consequently, this makes rice a potential vehicle for fortification. Rice fortification will have benefits to the consumers and processors. Benefits to the consumers include prevention or minimization of the risk of occurrence of micronutrient deficiency in a population. It also has the potential for improvement of nutritional status and better physical and mental development. The benefits to the industry include product differentiation and new markets. To complement ongoing initiatives on food fortification, a total of 7 micronutrients were selected for rice fortification. These includes 2 minerals (iron and zinc) and 5 vitamins (B1, B3, B6, B9 and B12). The nutrients were selected considering ongoing fortification program, nutritional status within the region, guidance of Codex principles of addition of essential nutrients and WHO/FAO guidelines for food fortification.

Fortified milled rice— Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for fortified milled rice of the varieties grown from rice grains, (Oryza spp.) intended for human consumption

This standard applies to both milled and brown rice.

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 2004.05, *Total folates in cereal and cereal foods — Microbiological Assay-Trienzyme Procedure*

AOAC 2011.14, *Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Phosphorus, Sodium and Zinc in fortified food products. Microwave Digestion and Inductively Coupled Plasma-Optical Emission Spectrometry*

AOAC 953.17, *Thiamine (vitamin B1) in grain products. Fluorometric (rapid) method*

AOAC 961.15, *Vitamin B6 (pyridoxine,pyridoxal,pyridoxamine) in food extracts. Microbiological method*

AOAC 975.41, *Niacin and niacinamide in cereal products. Automated method*

CXS 193, *General standard for contaminants and toxins in food and feed*

EAS 128, *Milled rice — Specification*

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

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

EAS 765, *Brown rice — Specification*

EAS 803, *Nutrition labelling — Requirements*

EAS 804, *Claims on foods — General requirements*

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

EAS 900, *Cereals, pulses and their products — Sampling*

EAS 901, *Cereals, pulses and their products — Test methods*

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

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 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp.*

ISO 6888-1, *Microbiology of the food chain — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Method using Baird-Parker agar medium*

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

— IEC Electropedia: available at http://www.electropedia.org/

3.1
milled rice fortification
practice of deliberately adding micronutrient(s), that is vitamins and minerals (including trace elements) in rice, so as to improve the nutritional quality of the rice and provide a public health benefit with minimal risk to health

3.2
fortification compound/fortificant
substance which contains micronutrient intended to be added to rice

3.3
fortified rice kernels (FRK)
rice grain which is a carrier of fortificant or added micronutrients

Note of entry 1: FRK should be produced from rice complying with either EAS 128 or EAS 765.

3.4
milled rice
whole or broken kernels of rice (Oryza spp.) from which the germ, embryo or at least the outer bran layer have been removed

3.5
brown rice
rice (Oryza spp) from which only the outermost layer (the husk) of a grain of rice has been removed

3.6
fortified milled rice
milled rice to which fortified rice kernels have been added

3.7
broken kernel
pieces of rice that are less than three-quarters of a whole kernel and include grains of rice in which part of the endosperm is exposed or rice without a germ. If the piece is more than three-quarters of a kernel, it is considered whole.

3.8
bran
by-product from milling consisting of the outer (pericarp) layers of the kernel with part of the germ

3.9
food grade packaging material
packaging material, made of substances which are safe and suitable for their intended use, and which will not impart any toxic substance or undesirable odour or flavour to the product

4 Requirements

4.1 Classification

Fortified milled rice shall be classified as long grain, medium grain or short grain as specified in EAS 128. and EAS 765.

4.2 General requirements

Fortified milled rice shall be milled rice complying to EAS 128 or EAS 765 containing fortified rice kernels

4.3 Specific requirements

Fortified milled rice grains shall comply with the specific requirements provided in EAS 128 for milled rice or EAS 765 for brown rice and fortification requirements as provided in clause 4.4 of this standard.

4.4 Fortification requirements

4.4.1 Fortified milled rice

Fortified milled rice shall comply with requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Requirements for levels of micronutrients in fortified milled rice

S/N	Nutrient	Requirements (mg/kg), min.	Test method
1.	Thiamine (Vitamin B1)		AOAC 953.17
2.	Niacin (Vitamin B3)	44	AOAC 975.41
3.	Pyridoxine (Vitamin B6)	4	AOAC 961.15
4.	Folates (Vitamin B9)	0.5	AOAC 2004.05
5.	Cobalamin (Vitamin B12)	0.006	ISO 20634
6.	Iron	20	AOAC 2011.14
7.	Zinc	30	AOAC 2011.14

4.4.2 Fortified rice kernels

4.4.2.1 General requirements

a) The mixing addition rate of fortified rice kernels shall be declared on the label

b) The mixing/addition rate of the fortified rice kernels formulated as specified in table 2 shall be at a rate of 0.5 % of the milled rice declared on the label.

c) Formulation of fortified kernel rice may be varied from table 2 provided that the declared addition rate shall be between 0.5 – 2 %. Where variation is made the nutrient composition of the fortified rice kernel shall be determined using the following formula

Nutrient g/kg $= \left(\frac{a}{b}\right) \times c$

a *is 0.5 %.*

b *is the declared addition rate in %*

c *is g/kg of nutrient of premix specified in this table (column 4 of table 2)*

4.4.2.2 Specific requirements for fortified rice kernel

Fortified rice kernels shall comply with requirements given in Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Formulation of fortified rice kernels

S/N	Micronutrient	Fortification compound/fortificant	Micronutrient content, min. (g/kg)	Test method
1.	Thiamine (Vitamin B1)	Thiamine mononitrate	2.0	AOAC 953.17
2.	Niacin (Vitamin B3)	Niacinamide	17	AOAC 975.41
3.	Pyridoxine (Vitamin B6)	Pyridoxine hydrochloride	2.0	AOAC 961.15
4.	Folates (Vitamin B9)	Folic Acid	0.3	AOAC 2004.05
5.	Cobalamin (Vitamin B12)	Cyanocobalamin	0.003	ISO 20634
6.	Iron	Micronized ferric pyrophosphate.	6	AOAC 2011.14’
7.	Zinc	Zinc oxide.	7	AOAC 2011.14

5 Contaminants

5.1 Pesticide residues

Fortified milled rice shall comply with pesticide residue limits established by the Codex Alimentarius Commission.

5.2 Heavy metals

Fortified milled rice shall comply with levels for heavy metals specified in CXS 193.

5.3 Aflatoxins

Fortified milled rice shall comply with levels for aflatoxins given in Table 3 when tested in accordance with the test methods specified therein.

Table 3 — Aflatoxin limits for Fortified milled rice

S/N	Aflatoxin	Maximum limit, µg/kg	Test method
1.	Total aflatoxins (AFB1+AFB2+AFG1 +AFG2)	10	EAS 901
2.	Aflatoxin B1	5	

6 Hygiene

6.1 Fortified milled rice shall be produced, prepared, and handled in accordance with EAS 39.

6.2 Milled rice shall comply with the limits given in Table 4 when tested in accordance with the test methods specified therein.

Table 4 — Micro-organisms limits for Fortified milled rice

S/N	Micro-organism	Limit	Test method
1.	*Escherichia coli*, CFU/g, max.	10^2	ISO 16649-2
2.	*Salmonella* spp. in 25 g	Absent	ISO 6579-1
3.	Yeast and moulds, CFU/g', max.	10^4	ISO 21527-2
4.	*Staphylococcus aureus,* CFU/g, max.	10^3	ISO 6888-1

7 Packaging

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

8 Labelling

8.1 Labelling of retail containers

In addition to the labelling requirements specified in EAS 38 and EAS 803, the following information shall be labelled:

a) product name as "Fortified milled rice"; or "Fortified brown rice"

b) class:

i) long grain rice;

ii) medium grain rice; or

iii) short grain rice;

c) grade

NOTE: Each product unit may also be marked with the national food fortification Logo, in accordance with Partner States guidance

8.2 Nutritional labelling

The names and the amount of the nutrients added in the fortified rice shall be declared on the label in accordance with EAS 803

9 Nutrition and health claims

Fortified milled rice may have claims on nutrition and health. Such claims when declared shall comply with EAS 804 and EAS 805.

10 Sampling

Sampling shall be done in accordance with EAS 900

Bibliography

[1] EAS 128:2023, *Milled rice — Specification*

[2] Coalition for African Rice Development (CARD) website: https://riceforafrica.net/

