
Rough (paddy) rice — Specification

Public Review Draft for comments only — Not to be cited as African Standard



Table of contents

1	Scope	1
2	Normative references	1
3	Terms and Definitions	2
4	Requirements	4
4.1	General requirements	4
4.2	Specific requirements	5
4.3.	Grading	5
5	Contaminants	6
5.1	Heavy metals	6
5.2	Pesticide residues.....	6
6	Hygiene	6
7	Packaging.....	6
8	Weights and measures.....	6
9	Labelling	6
10	Sampling methods.....	7
	Bibliography	8

Public Review Draft for comments only — Not to be cited as African Standard

Foreword

The African Organization for Standardization (ARS) is an African intergovernmental organization made up of the United Nations Economic Commission for Africa (UNECA) and the Organization of African Unity (AU). One of the fundamental mandates of ARSO is to develop and harmonize African Standards (ARS) for the purpose of enhancing Africa's internal trading capacity, increase Africa's product and service competitiveness globally and uplift the welfare of African communities. The work of preparing African Standards is normally carried out through ARSO technical committees. Each Member State interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, Regional Economic Communities (RECs), governmental and non-governmental organizations, in liaison with ARSO, also take part in the work.

ARSO Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare ARSO Standards. Draft ARSO Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an ARSO Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ARSO shall not be held responsible for identifying any or all such patent rights.

This African Standard was prepared by the ARSO Technical Committee on Agriculture and Food Products ARSO TC 12

© African Organisation for Standardisation 2022 — All rights reserved*

ARSO Central Secretariat
International House 3rd Floor
P. O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel. +254-20-2224561, +254-20-311641, +254-20-311608

Fax: +254-20-218792

E-mail: arso@arso-oran.org

Web: www.arso-oran.org

* © 2022 ARSO — All rights of exploitation reserved worldwide for African Member States' NSBs.

Copyright notice

This ARSO document is copyright-protected by ARSO. While the reproduction of this document by participants in the ARSO standards development process is permitted without prior permission from ARSO, 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 ARSO.

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

© African Organisation for Standardisation 2022 — All rights reserved

ARSO Central Secretariat
International House 3rd Floor
P.O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel: +254-20-2224561, +254-20-311641, +254-20-311608
Fax: +254-20-218792

E-mail: arso@arso-oran.org
Web: www.arso-oran.org

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

Introduction

Rice is a widely consumed cereal grain in Africa. Rice is grown, from river deltas to mountainous regions and mainly uses rain-fed systems. Predicted demands for rice remain strong. In Africa, where rice is the most rapidly growing food source, about 30 million tonnes more rice will be needed by 2035, representing an increase of 130 % in rice consumption from 2010.

This standard has been developed to take into account:

- a) the needs of the market for the product;
- b) the need to facilitate fair domestic, regional and international trade and prevent technical barriers to trade by establishing a common trading language for buyers and sellers;
- c) the structure of the CODEX, UNECE, USA, ISO and other internationally significant standards;
- d) the needs of the producers in gaining knowledge of market standards, conformity assessment, commercial cultivars and crop production process;
- e) the need to transport the product in a manner that ensures keeping of quality until it reaches the consumer;
- f) the need for the plant protection authority to certify, through a simplified form, that the product is fit for cross-border and international trade without carrying plant disease vectors;
- g) the need to promote good agricultural practices that will enhance wider market access, involvement of small-scale traders and hence making farming a viable means of wealth creation; and
- h) the need to ensure a reliable production base of consistent and safe crops that meet customer requirements.

Rough (paddy) rice — Specification

1 Scope

This African Standard specifies the requirements and methods of sampling and test for rough (paddy) rice of the varieties grown from *Oryza* spp intended for human consumption.

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.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

AOAC Official Method 2001.04, *Determination of Fumonisin B₁ and B₂ in corn and corn flakes — Liquid chromatography with immunoaffinity column cleanup*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 605, *Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 711, *Cereals and cereal products — Determination of moisture content (Basic reference method)*

ISO 712, *Cereals and cereal products — Determination of moisture content — Routine reference method*

ISO 5984, *Animal feeding stuffs — Determination of crude ash*

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

ISO 6561-1, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

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

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

ISO 6639-1, *Cereals and pulses — Determination of hidden insect infestation — Part 1: General principles*

ISO 6639-2, *Cereals and pulses — Determination of hidden insect infestation — Part 2: Sampling*

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*

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

DARS 858:2022 (E)

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

ISO 24333, *Cereals and cereal products — Sampling*

ISO 27085, *Animal feeding stuffs — Determination of calcium, sodium, phosphorus, magnesium, potassium, iron, zinc, copper, manganese, cobalt, molybdenum, arsenic, lead and cadmium by ICP-AES*

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 Terms and Definitions

For the purpose of this standard the following definitions apply.

3.1

paddy/ rough rice

whole or broken kernels of rice (*Oryza glaberrima*, *Oryza sativa*, *Oryza longistaminata*) retaining its husk after threshing

3.2

waxy rice

glutinous rice

varieties of rice whose kernels have a white and opaque appearance

NOTE The starch of waxy rice consists almost entirely of amylopectin. The kernels have a tendency to stick together after cooking.

3.3

head rice

whole paddy or part of paddy with a length greater than or equal to three-quarters of the average length of the test sample paddy

3.4

average length, *L*

arithmetic mean of the length of the test sample paddy that are not immature or malformed and without any broken parts

3.5

extraneous matter

inorganic and organic components other than whole or broken kernels of rice

3.6

foreign matter

all organic and inorganic material (such as plant parts, sand, soil, glass) other than paddy/rough rice

3.6.1

inorganic foreign matter

components, such as stone, sand and dust

3.6.2

organic foreign matter

components such as filth, rodents and their derivatives and non rice plant matter

3.7

filth

impurities of animal origin including dead insects

3.8

heat-damaged paddy

head rice or broken paddy that has changed its normal colour as a result of heating

NOTE This category includes paddy that is yellow to dark yellow in the case of non-parboiled rice and orange to dark orange in the case of parboiled rice

3.9

damaged kernel

head rice or broken kernel showing evident deterioration due to moisture, pests, disease, heat or other causes

3.9.1

discoloured grains

Paddy/rough rice discoloured by heat, fermentation, moulds, weather damage or disease but does not include black point which is brown, dark brown or almost black discoloration at the embryo end of the grain

3.9.1.1

spotted kernel

whole or broken kernel showing a well defined small circle of dark colour or more or less regular shape

3.9.1.2

stained kernel

whole or broken kernel which has undergone on a small area of its surface an obvious change in its natural colour. The stains maybe of different colours e.g., blackish, reddish and brown. Deep black striations are also considered stains

3.9.1.3

specks

head rice or broken kernel of parboiled rice of which more than one-quarter of the surface is dark brown or black in colour due to the parboiling process

3.9.2

immature kernel

whole or broken kernel which is undeveloped

3.9.3

shrivelled kernel which has become shrunken and wrinkled from great heat or lack of moisture

3.9.4

black kernel

a kernel showing a distinctly dark colouration

3.9.5

over-dried damaged

refers to defective grains caused by overheating during artificial drying. It can be detected where grain is hot, exhibits an unusual odour, exhibits significant sprouting (greater than 10%) or other evidence of weather damage

3.9.6

paddy rough rice

rough rice which contains more than 3.0 percent of smutty kernels

3.10

immature kernel/ malformed kernel

head rice or broken kernel which is unripe or badly developed

DARS 858:2022 (E)

3.11

milling yield

estimate of the quantity of whole kernels and total milled rice (whole and broken kernels combined) that are produced in the milling of rough rice to a well-milled degree

3.12

parboiled rough rice

rough rice in which the starch has been gelatinized by soaking, steaming, and drying

3.13

poisonous, toxic and/or harmful seeds

seeds which if present may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — *Datura* (*D. fastuosa* Linn and *D. stramonium* Linn.) corn cokle (*Agrostemma githago* L., *Machai Lallium remulenum* Linn.) Akra (*Vicia* species), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

3.14

green/immature kernel

whole or broken kernel, which is undeveloped and may be green in colour

3.15

yellow kernel

whole kernel, which has undergone, totally or partially, through heating or other causes, a change in its natural colour and has taken a lemon or orange-yellow tone

3.16

amber kernel

whole kernel, which has undergone thorough heating or other causes, a slight uniform change in colour over the whole surface; this change alters the colour of the kernel to a slight amber-yellow

3.17

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 General requirements

4.1.1 Paddy/Rough rice shall meet the following minimum requirements/limits as determined using the relevant standards listed in Clause 2. Rough rice shall be:

- (a) the dried mature grains of edible *Oryza spp*;
- (b) clean, wholesome, uniform in size, colour and shape;
- (c) safe and suitable for human consumption;
- (d) free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration;
- (e) free from micro-organisms and substances originating from micro-organisms, fungi or other poisonous or deleterious substances in amounts that may constitute a hazard to human health.
- (f) free of living insects.

4.1.2 Rough rice shall be in form of well-filled grains of uniform colour representative of the declared variety.

4.2 Specific requirements

4.2.1 Long Grain Rough Rice

Long grain rough rice shall consist of rough rice which contains more than 25.0 % of whole kernels of rough rice and in Grades 1 through 4 not more than 10.0 % of whole or broken kernels of medium or short grain rice.

4.2.2 Medium Grain Rough Rice

Medium grain rough rice shall consist of rough rice which contains more than 25.0 % of whole kernels of rough rice and in Grades 1 through 4 not more than 10.0 % of whole or broken kernels of long grain rice or whole kernels of short grain rice.

4.2.3 Short Grain Rough Rice

Short grain rough rice shall consist of rough rice which contains more than 25.0 % of whole kernels of rough rice and in Grades 1 through 4 not more than 10.0 % of whole or broken kernels of long grain rice or whole kernels of medium grain rice.

4.2.4 Mixed Rough Rice

Mixed rough rice shall consist of rough rice which contains more than 25.0 % of whole kernels of rough rice and more than 10.0 % of "other types".

4.3. Grading

Paddy/Rough rice may be graded into three grades on the basis of the tolerable limits established in Table 1 which shall be additional to the general requirements set out in this standard.

Table 1 — Specific requirements

S/No.	Characteristics	Maximum limits			Method of test	
		Grade 1	Grade 2	Grade 3		
(1)	Foreign matter, % m/m	Organic	1.0	1.5	2.0	ISO 605
		Inorganic	0.25	0.25	0.5	
(2)	Pest damaged grains, % m/m, max	0.5	0.75	1.0		
(3)	Discoloured grains, % m/m, max	0.1	0.5	1.0		
(4)	Moisture, % m/m, max	14.0	14.0	14.0	ISO 711; ISO 712	
(5)	Immature/shrivelled grains, % m/m	1.0	3.0	5.0	ISO 605	
(6)	Total aflatoxin (AFB ₁ +AFB ₂ +AFG ₁ +AFG ₂), ppb, max	10			ISO 16050	
(7)	Aflatoxin B ₁ only, ppb, max	5				
(8)	Fumonisin, ppm, max	2			AOAC 2001.04	
NOTE Broken % in brown and milled rice to be used to evaluate the paddy grades.						

DARS 858:2022 (E)

5 Contaminants

5.1 Heavy metals

Paddy/rough rice shall comply with those maximum limits for metal contaminants specified in CODEX STAN 193 established by the Codex Alimentarius Commission.

5.2 Pesticide residues

Rough rice shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

6 Hygiene

Paddy/rough rice shall be produced and handled under hygienic conditions in accordance with ARS 53.

7 Packaging

7.1 Paddy/rough rice shall be packed in food grade packaging material, which will safeguard the hygienic, nutritional and organoleptic qualities of the products.

7.2 Rough rice shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

7.3 Each package shall be securely closed and sealed.

7.4 Each package shall contain rough rice of the same type and of the same grade designation.

7.5 If rough rice is presented in bags, the bags shall also be free of pests and contaminants.

8 Weights and measures

Rough/paddy rice shall be packaged in accordance with the weights and measures regulations of the destination country.

NOTE Maximum package weight of 50 kg where human loading and offloading is involved.

9 Labelling

The following specific labelling requirements shall apply and shall be legibly and indelibly marked in accordance with the requirements of ARS 56:

- (i) product name as "Rough/Paddy Rice";
- (ii) variety;
- (iii) grade;
- (iv) name, address and physical location of the producer/ packer/importer;
- (v) lot/batch/code number;

- (vi) net weight, in kg;
- (vii) the declaration “Food for Human Consumption”
- (viii) storage instruction as “Store in a cool dry place away from any contaminants”;
- (ix) crop year;
- (x) packing date;
- (xi) instructions on disposal of used package;
- (xii) country of origin;
- (xiii) a declaration on whether the rough rice was genetically modified or not.

10 Sampling methods

Sampling shall be done in accordance with the ISO 24333.

Public Review Draft for comments only — Not to be cited as African Standard

Bibliography

EAS 764:2011, *Rough (paddy) rice — Specification*

United States Standards for Rough Rice, Updated July 2005

ISO 7301:2011, *Rice — Specification*

CODEX STAN 198:1995, *Standard for Rice*

Public Review Draft for comments only — Not to be cited as African Standard

Public Review Draft for comments only — Not to be cited as African Standard