

Kenya pishori milled rice — Specification

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In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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ICS 67.060

Kenya pishori milled rice — Specification

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Foreword

This Kenya Standard has been prepared by the Cereals and Pulses Technical Committee under the guidance of the Standards Project Committee and it is in accordance with the procedures of the Kenya Bureau of Standards.

This second edition cancels and replaces the first edition (KS 2087:2009), which has been technically revised.

Kenya pishori is valued for its distinct aroma, taste and fine cooking qualities as a non-glutinous rice variety. Thus Kenya pishori has also been used for blending to improve quality of other rice varieties offered for sale to the consumers.

However, there has emerged a malpractice of blending rice of inferior quality with certain proportion of Kenya pishori and selling the blends as pure Kenya pishori. The revision of this standard is therefore geared towards identifying “Kenya pishori” as a national heritage, eliminating the associated marketing malpractices and safeguarding the interests of the stakeholders as well as guaranteeing the enhanced safety of the consumers.

During the preparation of this standard, reference was made to the following documents:

MS 225:1974 Specification for milled rice.

Standard for milled rice (Federal Grain Inspection service USDA) – USA, 1983.

Pakistan Standard: Specification for Rice – PS 3342:1993.

Codex Standard for Rice, Codex Stan 198, 1995.

Forum for Agricultural Research for Africa in Accra, Ghana (FARA), 2004.

University of Arkansas Rice Processing Program (UARPP), 2004.

International Rice Research Institute (IRRI) in Phillipines (IRRI), 2005.

West Africa Rice Development Association (WARDA), 2005.

East African Standard 123- Milled rice - specification

Acknowledgement is hereby made for the assistance derived from these sources.

Kenya pishori milled rice — Specification

1 Scope

This Kenya Standard specifies requirements, classification, grading and prescribes methods of tests for Kenya pishori milled rice (*Oryza sativa*) intended for human consumption.

2 Normative References

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

EAS 38, *Labelling of pre-packaged foods — Requirements*

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

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

EAS 765, *Brown rice — Specification*

EAS 900, *Cereals and pulses — Sampling*

EAS 901, *Cereals and pulses — Test methods*

3 Definitions

For the purposes of this standard, the following definitions shall apply:

3.1

Kenya pishori rice

shall be paddy or milled rice of varieties “NIBAM 10” and “NIBAM 11” as designate in research circles, and any other variety duly approved and released by Kenya Agricultural and Livestock Research Organization, as a “Kenya Pishori” variety for commercial production and exclusively grown in Kenya.

3.2

paddy

whole or broken unhulled kernels of rice (*Oryza spp*)

3.3

hull/husk

outer cover of the paddy grain

3.4

de-husking

the process of removing husk from the paddy

3.5

polishing

the process of intentionally removing bran layers from de-husked paddy

3.6

milling

the process of de-husking and/or polishing

3.7

brown rice

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

3.8

milled rice

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

3.9

polished rice

brown rice from which most of the bran layer has been intentionally removed

3.10

kernel

the edible portion of the paddy grain

3.11

whole kernel

a processed rice grain which is not broken

3.12

glutinous rice

a rice variety having amylose content below 2 % and characterized by a white and opaque appearance and a tendency of sticking together on cooking

3.13

non-glutinous rice

a variety of rice having amylose content above 2 % characterized by a hard translucent appearance which breaks with a clean vitreous fracture, and does not have the tendency of sticking together after cooking

3.14

chalky kernels

kernels, whole or broken, except for glutinous rice, of which at least 75 % of the surface has an opaque, floury appearance

3.15

immature grain

unripe and/or undeveloped whole or broken kernel

3.16

red kernel

head rice or broken kernel having a red bran covering more than 25 % of its surface

3.17

red streaked kernels

head rice or broken kernel with red bran streaks of length greater than or equal to 50 % of that whole kernel, but where the surface covered by these red streaks is less than 25 % of the total surface

3.18

head rice

whole kernel or part of the kernel with a length greater than or equal to 75 % of the average length of the test sample kernels

3.19

broken rice

pieces of rice that are less than three-quarters of a whole kernel and includes 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 as head rice.

3.20

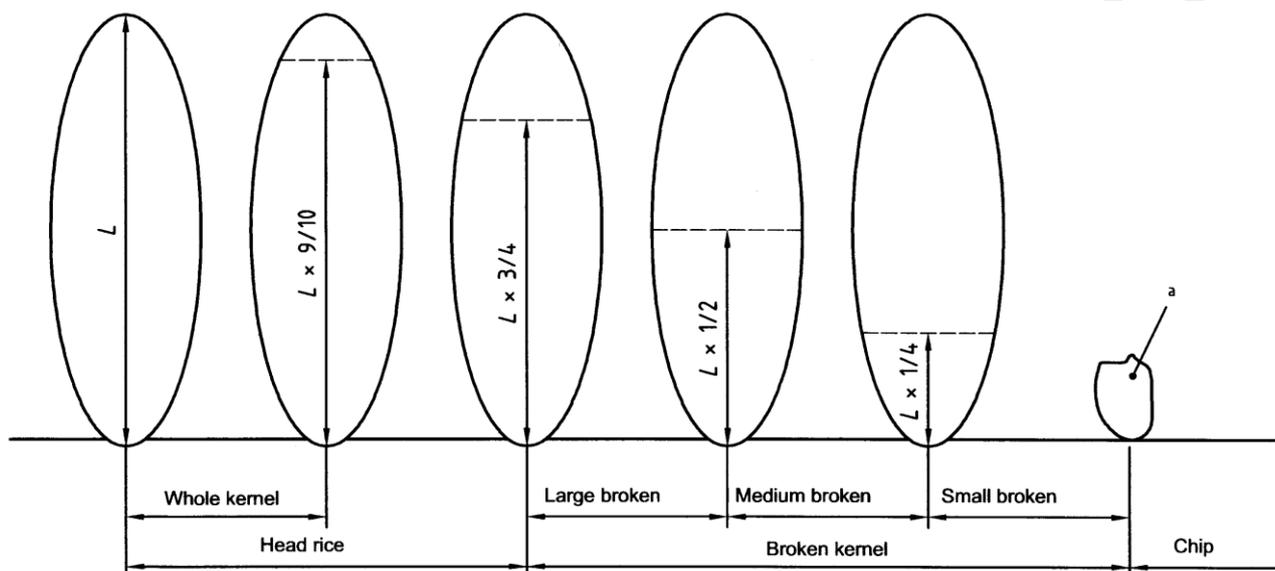
large broken kernel

part of kernel with a length less than three-quarters but greater than one half of the average length of the test sample kernels

3.21

medium broken kernel

part of kernel with a length less than or equal to one half but greater than one quarter of the average length of the test sample kernels (see Figure 1)



Key

a Not passing through a round perforation of 1.4 mm in diameter

L is the average length

Figure 1 — Size of kernels, broken kernels and chips

3.22

finely broken rice/chips

broken kernels of milled rice, of less than 25 % of the average length of the whole kernel

3.23

damaged kernels

kernels, whole or broken which are distinctly damaged by insects, water, fungi or any other causative agents other than those caused by the milling process. They include stained, spotted and yellow grains

3.24

parboiled rice

paddy which has been steeped in water, steamed and dried before husks are removed and subsequently polished with a view to enhancing its nutrition value

3.25

bran

a product from the milling of rice, consisting of the outer (pericarp) layers of the kernel and part of the germ

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3.26

immature kernels

unripe and/or undeveloped whole or broken kernel which may be green in colour

3.27

foreign matter

all organic and inorganic material

3.28

inorganic matter

stones, glass, pieces of soil and other mineral matter

3.29

organic matter

any animal or plant matter (seed coats, straws, weeds) other than rice, damaged rice, other grains, inorganic extraneous matter and harmful/toxic seeds

3.30

filth

impurities of animal origin

3.31

objectionable rice

rice which is mouldy, musty or chemically contaminated and unfit for human consumption

3.32

other rice varieties

whole or broken kernels of rice with different grain characteristics in size, shape and aroma from "Kenya pishori"

3.33

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 Classification

4.1 Kenya pishori milled rice shall be classified based on length, shape and mass as indicated, when tested according to EAS 901.

4.2 Kenya pishori Milled rice shall be of the following grain types based on the length of the kernel:

4.2.1 Extra long grain

Having an average kernel length of 7.00 mm and above.

4.2.2 Long grain

Grain with average kernel length of 6.00 mm and 6.99 mm.

4.2.3 Medium grain

Grain with an average kernel length of 5.0 mm to 5.99 mm.

4.2.4 Short grain

Grain with average kernel length of less than 5.00 mm.

4.3 Milled rice shall be of the following types based on the shape of the kernel:

4.3.1 Slender

Milled rice having a kernel length over three times its breadth. Also known as long grain rice.

4.3.2 Medium

Milled rice having a kernel length/width ratio between 2.1 and 2.9.

4.3.3 Bold

Milled rice having a kernel length/width ratio between 1.1 and 2.0.

4.3.4 Round

Milled rice having a kernel length/width ratio less than 1.1.

4.4 Milled rice shall be of the following type based on the mass of the kernel:

4.4.1 Extra heavy

1 000 whole milled kernels with 14 % moisture content weighing over 25 g.

4.4.2 Heavy

1 000 whole milled kernels with 14 % moisture content weighing 20 g to 25 g.

4.4.3 Light

1 000 whole milled kernels with 14 % moisture content weighing under 20 g.

5.1 Quality requirements

5.1 General requirements

Kenya pishori shall have the following characteristics:

5.1.1 Shall be milled rice obtained only from such paddy or brown rice that complies with EAS 764 and EAS 765

5.1.2 Shall be obtained from paddy of moisture content not more than 14 %.

5.1.3 Shall fall under the classification "long grain" as defined in 3.2.2.

5.1.4 Shall fall under the classification "slender grain" as defined in 3.3.1.

5.1.5 Shall fall under the classification "light grain" as defined in 3.4.3.

5.1.6 Shall be non-glutinous as defined in 2.13.

5.1.7 Shall have a minimum amylose content of 10 % when tested according to Annex A.

5.1.8 Shall not contain any foreign varieties beyond the limits stated in Table 1.

5.1.9 Shall be of uniform colour, and desirable appearance.

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5.1.10 Shall have a typical flavour and be free from rancid taste.

5.1.11 Shall have a typical aroma when tested according to Annex B. Addition of artificial aroma is prohibited.

5.1.12 Shall be free from unpleasant or repulsive odours.

5.1.13 The use of Kenya pishori milled rice for the purposes of blending shall be limited only to the guidelines stipulated in the KS 2086, Varieties blend milled rice — Specification.

5.1.14 Kenya pishori milled rice shall be free from all contaminants and adulterants such as but not limited to insects, rodents and their derivatives.

5.2 Specific quality requirements/limits

“Kenya pishori milled rice” shall comply with the specifications on Table 1.

Table 1 — Specific quality requirements/limits for Kenya pishori milled rice

SL No.	Grading factor	Grade requirement/limits				Test method EAS 901
		Premium	Grade 1	Grade 2	Grade 3	
i)	Moisture content, % m/m, max.	14				Clause 5
						Clause 4
iii)	Broken, % m/m, max.	5	15	25	35	
iv)	Chalky/green immature grains, % m/m, max.	1	3	5	10	
v)	Red or red streaked, % m/m, max.	Nil	Nil	0.25	0.5	
vi)	Foreign varieties, % m/m max.	Nil	Nil	1	2	
vii)	Foreign and extraneous matter, % m/m max.	Nil	0.2	0.3	0.6	
	Inorganic matter	0.1				
	filth					
viii)	Paddy, (grains per 1 000) by count (or % m/m), max.	3 (0.03)	30 (0.3)			
ix)	Damaged grains, % m/m max.	Nil	1	2	3	

6.0 contaminants

6.1 Pesticide residues

Pishori Milled rice shall comply with pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

6.2 Other contaminants

6.2.1 Pishori Milled rice shall comply with limits for heavy metals specified in CODEX STAN 193 established by Codex Alimentarius Commission.

6.2.2 Pishori Milled rice shall comply with limits for mycotoxins given in Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Mycotoxin limits for pishori milled rice

S/NO	Mycotoxin	Maximum limit	Test method EAS 901
i.	Total aflatoxins (AFB ₁ +AFB ₂ +AFG ₁ +AFG ₂), µg/kg	10	Clause 9 or 10
ii.	Aflatoxin B ₁ , µg/kg	5	

7 Hygiene

Pishori Milled rice shall be produced, prepared and handled in accordance with EAS 39.

.

8 Weights and measures

Pishori Milled rice shall be packaged in accordance with the weights and measures regulations of the destination country.

NOTE Kenya is a signatory to the International Labour Organizations (ILO) for maximum package weight of 50 kg where human loading and offloading is involved.

9 Packaging

9.1 Pishori Milled rice shall be packed in food grade packaging materials which will safeguard the hygienic, nutritional, and organoleptic qualities of the products.

9.2 Each package shall be securely closed and sealed.

10 Labelling

In addition to the requirements in EAS 38, Labelling of pre-packaged foods, each package shall be legibly and indelibly marked with the following:

- i) product name as “Kenya pishori milled rice”;
- ii) grain type (long, medium or bold);

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- ii) variety;
- iv) grade;
- v) name, address and physical location of the miller/ packer/importer;
- vi) lot/batch/code number;
- vii) net weight in kg;
- viii) the declaration “food for human consumption”;
- ix) storage instruction as “store in a cool dry place away from any contaminants”;
- x) production date;
- xi) expiry date;
- xiii) instructions on disposal of used package;
- xv) a declaration on genetic modification status.

10.1.1 A declaration of other varieties and blends as Kenya pishori is prohibited and shall be punishable by law under the Standards Act, Cap. 496 of the Laws of Kenya.

10.1.2 Introduction of artificial aroma is prohibited and does not qualify a variety to be “Kenya Pishori Rice”.

10.2 Labelling of non-retail bulk containers

Information in 9.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the processor or packer as well as storage instructions, shall appear on the container.

However, lot identification, and the name and address of the processor or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

11. cooking quality / sensory evaluation

When cooked, Kenya Pishori rice shall retain the characteristic natural aroma

When cooked Kenya Pishori rice shall expand and be fluffy

10 Sampling

Sampling shall be done in accordance with EAS 900.

Annex A (normative)

Determination for amylose

A.1 Method of test for amylose

Reaction of iodine with the amylose fraction of starch gives a blue-coloured inclusion type product. The formation of this complex is employed in the determination of the amylose content of various food materials. Blue values of food samples are compared with those of pure amylose standards on a calibration curve.

A.2 Standard curve

A standard curve will be prepared by making standard amylose solutions to cover 0-10.0 ppm m/v.

A.2.1 Stock solution

Accurately weigh 1 g of amylose and dissolve it in 1 L of distilled water. This solution contains 100 ppm of amylose. Take 10 mL of the stock solution into 100-mL volumetric flask and make to the mark with distilled water. This solution contains 100 ppm amylose.

A.2.2 Prepare standard solutions of 2 ppm, 4 ppm, 6 ppm, 8 ppm and 10 ppm for determination by pipetting 2 mL, 4 mL, 6 mL, 8 mL and 10 mL from the solution prepared above. Make to the mark with water in a 100-mL volumetric flask.

A.2.3 Read absorbance at 610 nm on an ultra-violet visible spectrophotometer. Prepare a calibration curve of absorbance against concentration.

A.3 Method

A.3.1 0.5 g of finely ground material is weighed accurately in a small beaker. The power is dampened with 2 mL ethyl alcohol and 20 mL water added. 4 mL of 10 % NaOH solution are added and the mixture is filtered through No.1 Whatman filter paper and the filtrate made to 100 mL with distilled water.

A.3.2 5 mL of the solution are pipetted in a 250-mL volumetric flask, 100 mL water added and 5 drops of 6N HCl added to make the solution acidic. The solution is mixed thoroughly with 15 mL of the iodine solution (see Clause A.4) and made to 250 mL with distilled water.

A.3.3 Read absorbance of the blue colour developed on a ultra-violet visible spectrophotometer at 610 nm and determine concentration from the prepared calibration curve.

A.3.4 Calculate and report the amylose content in the original sample taking into consideration the dilutions made.

A.4 Preparation of Iodine solution

10 mg of iodine and 1 g KI are dissolved in a little water and made to 50 mL with distilled water.

ANNEX B

Determination of aroma in rice

A. DNA TEST USING MOLECULAR MARKER

1. Collect rice grains from the sample to be tested and a known check variety e.g. Basmati 370.
 2. Extract DNA from the grains.
 3. Genotype using the molecular marker for aroma BADH2 for aroma.
 4. Score the genotype for each sample and compare to the Basmati 370 genotype.
- Rice lines /varieties that carry similar allele/genotype to Basmati 370 are aromatic.

B. AROMA TEST USING POTASIUUM HYDROXIDE(KOH)

Measured at ripening, when the caryopsis is hard. The main component of aroma in rice is the 2-acetyl-1-pyrroline(AcPy).

1. 10ml of 1.7% solution of KOH should be added to 2 g of decorticated grains.
 2. The aroma, which is similar to that in popcorn, is released within 10 min.
 3. The level of expression is determined by comparison with other varieties being evaluated.
- Scale: 1) absent or very weak, 2) weak, 3) strong

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