

GCC STANDARDIZATION ORGANIZATION (GSO)

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RICE KERNELS

Prepared by:

Gulf technical committee for standards of food and agriculture products

This document is a draft Gulf standard circulated for comments, it is therefore, subject to change, and may not be referred to as a Gulf standard, until approved by the Board of Directors.

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Foreword

Standardization Organization for GCC (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulation through specialized technical committees (TCs).

GSO through the technical program of committee TC No 5 " The Gulf Technical Committee for Food and Agricultural Standards Products" has updated this Standard . The Draft Standard has been prepared by (KINGDOM OF SAUDI ARABIA)

The draft Standard has been updated based on relevant ADMO, International and National foreign Standards and references.

This standard has been approved as Gulf (Standard / Technical Regulation) by GSO Board of Directors in its meeting No.../....held on / / / H , / / G

RICE KERNELS

1. SCOPE AND FIELD of APPLICATION

This standard applies to brown rice, white rice, enriched and parboiled rice, all for direct human consumption, presented in packaged form or sold loose from the package directly to the consumer. It doesn't apply to other products derived from rice or to glutinous rice.

2. COMPLEMENTARY REFERENCES

- 2.1 GSO 9 "Labeling of Prepackaged Foods".
- 2.2 GSO 21 "Hygienic Regulations for Food Plants and their Personnel".
- 2.3 GSO 168 "Conditions of Storage Facilities for Dry and Canned Food Stuffs".
- 2.4 GSO ISO 950 "Cereals-Sampling (as grains)".
- 2.5 GSO 382 "Maximum Limits for Pesticide Residue in Agriculture and Food Products, Part 1".
- 2.6 GSO 383 "Maximum Limits for Pesticide Residue in Agriculture and Food Products, Part 2".
- 2.7 GSO 839 "Food Packages, Part I, General Regulations".
- 2.8 GSO 841 "Maximum limits of mycotoxins permitted in Food and Animal Feed-Aflatoxins".
- 2.9 GSO 988 "Radiation Level Permitted in Food Products".
- 2.10 GSO 1016 "Microbiological Limits Permitted in Food Products".
- 2.11 GSO 1806 "Methods of Test for kernels Rice".
- 2.12 GSO 1863 "Food Packages, Part II, Plastic Packages, General Regulations".
- 2.13 GSO that will be approved later on "General Requirements For Processed Genetically Modified Food and Feed".

3. DEFINITIONS

- 3.1 **Rice:** is whole and broken kernels obtained from the species *Oriza Sativa* L.
- 3.2 **Paddy rice:** is rice that has retained its husk.
- 3.3 **Brown rice:** is paddy rice from which the husk only has been removed with keeping all or part of the bran layers.
- 3.4 **White rice (milled rice):** is brown rice from which all or part of the bran and germ have been removed by milling.

- 3.5 **Glutinous rice (waxy rice):** kernels of special varieties of rice which have a white and opaque appearance. The starch of glutinous rice consists almost entirely of amylopectin. It has a tendency to stick together after cooking.
- 3.6 **Parboiled rice (Mazza or Sella):** paddy rice that has been boiled in water for few minutes so that the starch is fully gelatinized, followed by a drying and dehulling process, to become brown rice, or further milled to become white rice.
- 3.7 **Enriched rice:** white rice which has been enriched with suitable vitamins and minerals.
- 3.8 **Basmati Rice :** Basmati is the customary name for certain varieties of rice that having special characteristics (fluffy, length, aroma, taste, separate grains) and are grown exclusively in specific areas of India and Pakistan, and include the following nine approved rice varieties :-
- 1- Basmati 370
 - 2- Basmati 386-India
 - 3- Basmati 217
 - 4- Type 3 (Dehradun)
 - 5- Kernel (Pak Basmati)
 - 6- Taraori (Karnal Local, HBC-19)
 - 7- Ranbir Basmati (IET 11348)
 - 8- Pusa Basmati-1 (IET- 10364)
 - 9- Super Basmati
- Or any Basmati rice variety that will be approved in the future
- 3.9 **Heat-damaged kernels:** kernels, whole or broken, that have changed their normal color as a result of heating. These include whole or broken yellow kernels and parboiled rice in a batch of non-parboiled rice.
- 3.10 **Damaged kernels:** kernels, whole or broken, showing obvious deterioration due to moisture, pests, diseases, or other causes, but excluding heat-damaged kernels.
- 3.11 **Chalking kernels:** are whole or broken kernels except for glutinous rice, of which at least three-quarters of the surface have an opaque and floury appearance.
- 3.12 **Red kernels:** are whole or broken kernels with a red-colored pericarp covering more than one-quarter of their surface, as a result of incomplete milling, but excluding kernels damaged by heat or other causes.
- 3.13 **Red-streaked kernels:** are kernels, whole or broken, with red streaks, the lengths of which may be equal to or greater than one-half of that of the whole kernel, but the surface area covered by these red streaks shall be less than one-quarter of the total surface.
- 3.14 **Pecks:** are whole or broken kernels of parboiled rice of which more than one-quarter of the surface is dark brown or black in color.
- 3.15 **Immature kernels:** are unripe and/or undeveloped whole or broken kernels.

- 3.16 **Extraneous (foreign) matter:** organic and inorganic components other than kernels of rice.
- 3.17 **Filth:** impurities of animal origin (including dead insects or their parts, rodents, birds, and mites excreta).
- 3.18 **Plant impurities:** organic components of plant origin (such as foreign seeds, husk, bran, straw, paper, wood and thread).
- 3.19 **Inorganic impurities:** such as stones, sand dust, plastics, glass and metals.

4. CLASSIFICATION

- 4.1 If rice is classified as long grain, medium grain or short grain, the classification should be in accordance with one of the following specifications:

- 4.1.1 **Option 1:** kernel length/ width ratio as shown in Table (1).

Table (1): Classification of rice according to kernel length/width ratio (Option 1).

Class	Kernel length/width ratio	
	Brown rice Parboiled or non-parboiled	White rice Parboiled or non-parboiled
Long grain rice	3.1 or more :1	3.0 or more :1
Medium grain rice	2.1 – 3.0 :1	2.0 – 2.9 :1
Short grain rice	2.0 or less :1	1.9 or less :1

- 4.1.2 **Option 2:** the kernel length (mm) as shown in Table (2).

Table (2): Classification of rice according to the kernel length mm (Option 2)

Class	Kernel length (mm)
Long grain rice	6.6 or more
Medium grain rice	6.2 or more but less than 6.6
Short grain rice	Less than 6.2

- 4.1.3 **Option 3:** a combination of the kernel length (mm) and the length/width ratio as shown in Table (3).

Table (3): Classification of rice according to the kernel length and the length/width ratio (Option 3)

Class	Kernel length (mm)	Length/width ratio
Long grain rice	More than 6.0	3.0 or more :1
Medium grain rice	5.2 – 6.0	Less than 3.0 :1
Short grain rice	5.2 or less	Less than 2.0 :1

4.2 White rice color may be classified according to the following degrees of milling:

4.2.1 **White brown rice (Under-milled rice):** is obtained by milling brown rice but not to the degree necessary to meet the requirements of white rice.

4.2.2 **White rice (Well-milled rice):** is obtained by milling brown rice in such a way that some of the germ, all the external layers and most of the internal layers of the bran have been removed.

4.2.3 **Extra-white rice (Extra-well milled rice):** is obtained by milling brown rice in such a way that exceed white rice degree. Almost all of the germ, all of the external layers the largest part of the internal layers of the bran, and some of the endosperm have been removed.

4.3 Rice may be classified according to broken part as the following specifications:

4.3.1 **Whole kernel:** kernels without any broken part.

4.3.2 **Head rice:** kernels, the length of which is equal to or greater than three quarters of the average length of the corresponding whole kernels.

4.3.3 **Large broken kernels:** are fragments of kernel, the length of which is less than three-quarters but greater than one-half of the average length of a corresponding whole kernels.

4.3.4 **Medium broken kernels:** are fragments of kernel, the length of which is equal to or less than one-half but greater than one-quarter of the average length of a corresponding whole kernels.

4.3.5 **Small broken kernels:** are fragments of kernel, the length of which is equal to or less than one-quarter of the average length of a corresponding whole kernels but which does not pass through a metal sieve with round perforation 1.4 mm in diameter.

4.3.6 **Chips:** are fragments of kernel which pass through a metal sieve with round perforations 1.4 mm in diameter.

5. REQUIREMENTS

The following requirements shall be met in kernels of rice:

- 5.1 It shall be clean, sound and free from abnormal odours or odour which indicates deterioration.
- 5.2 It shall be free from fungi growth, live insects in all their life stages and live mites.
- 5.3 It shall be free from toxic or harmful seeds.
- 5.4 It shall have similar color, shape, kind and variety.
- 5.5 The moisture content shall not be greater than 15% (m/m).
- 5.6 It shall be processed according to hygienic regulations for food plants and their personnel proscribed in the GSO standard mentioned in item 2.2.
- 5.7 Pesticide residues shall not exceed the limits prescribed in the GSO standard mentioned in item 2.5 and item 2.6
- 5.8 Fungal toxins (Aflatoxin) shall not exceed the limits prescribed in the GSO standard mentioned in item 2.8
- 5.9 Radiation levels shall not exceed the limits prescribed in the GSO standard mentioned in item 2.9
- 5.10 Microbiological criteria shall not exceed the limits prescribed in the GSO standard mentioned in item 2.10
- 5.11 The classification shall comply with specifications prescribed in item 4.
- 5.12 In case of enriched rice, the minimum and maximum allowance of vitamins and minerals mentioned in Table 4 shall meet the values specified in the same table.
- 5.13 The maximum contents of defective kernels, other kinds of rice and extraneous matter shall not be greater than the values specified in Table 5.
- 5.14 In case of modified genetic rice shall be according to GSO standard mentioned in item 2.13
- 5.15 In case of Basmati rice item (3.8) the product shall contain at least 93% Basmati rice, if it is below than 93% it can not be named Basmati rice.

Table (4): Minimum and maximum allowance of vitamins and minerals in enriched rice

Vitamins and Minerals	Minimum allowance ppm	Maximum allowance ppm
Thiamin	4.4	8.8
Riboflavin	2.6	5.3
Niacin	35	70
Iron	29	57

**Table (5): Maximum contents of defective kernels,
other kinds of rice and extraneous matter**

Defect described	Maximum content % m/m			
	Brown rice	White rice	Brown rice Parboiled	White rice parboiled
Defective kernels:				
Heat-damaged	4.0*	3.0	8.0*	6.0
Damaged (no heat)	4.0	3.0	4.0	3.0
Immature	12.0	2.0	12.0	2.0
Chalky	11.0*	11.0	—	—
Red	12.0	4.0	12.0	4.0
Red-streaked	—	8.0	—	8.0
Pecks	—	—	4.0*	2.0
Chips	0.1	0.1	0.1	0.1
Other types of rice:				
Paddy	2.5	0.3	2.5	0.3
Brown	—	1.0	—	1.0
Glutinous	1.0	1.0	1.0	1.0
Extraneous matter:				
Organic plant impurities	1.5	0.5	1.5	0.5
Filth	0.1	0.1	0.1	0.1
Inorganic impurities	0.1	0.1	0.1	0.1

* After milling for control purposes.

6. SAMPLING

Samples shall be drawn according to the GSO standard mentioned in item 2.4

7. METHODS OF TEST

- 7.1 All necessary tests on the representative sample drawn according to item (6), shall be carried out according to the GSO standard mentioned in items 2.11.
- 7.2 In case of quantitative and qualitative analysis of Basmati rice, the following protocols are applied as guide lines:-
- Protocol for the identification of selected Basmati Rice varieties"- Food Standards Agency, london,and CAZS, Univeristy of Wales,Bangor – February 2005
 - Protocol for the quantitative analysis of adulteration of Basmati rice with sherbati, mugad sugandha, pak 386 or superfine "- Food Standards Agency, london,and CAZS, Univeristy of Wales,Bangor – February 2006

8. PACKAGING TRANSPORTATION AND STORAGE

The following specifications shall be observed on packaging, transportation and storage.

8.1 **Packaging:** without prejudice to the provisions of the GSO standard mentioned in items 2.7 and 2.12, kernels shall be packaged in suitable, clean, sufficiently strong and well stitched sacks or containers, not previously used and have no contaminating affect on the product or its quality characteristics.

8.2 Transportation

Rice kernels shall be transported in such a suitable way as to protect their quality characteristics. Transportation methods shall not be used for carrying pesticides or any other harmful or poisonous materials.

8.3 Storage

Without prejudice to the provisions of the GSO standard mentioned in item 2.7, rice kernels shall be stored in such a way as to safeguard the quality characteristics and to protect them from mechanical damage and contamination. Stores shall comply with hygienic requirements and shall prevent rice exposure to insects, rodents, birds, high moisture or temperature.

9. LABELLING

Without prejudice to the provisions of the GSO standard mentioned in item 2.1, the following information shall be indicated on each sack or container:

9.1 Rice type : white, brown, parboiled (Mazza or Sella).

9.2 Country of origin

9.3 Length of kernels (long, medium, short).

9.4 White rice color unparboiled (white brown, white, extra white).

9.5 Total percentage of broken kernels.

9.6 Percentage of each broken part (%head, %large, %medium, %small).

9.7 Cooking method. (voluntary)

9.8 Crop year (..... crop).

9.9 Vitamins and minerals (if found).

9.10 Additives (if found).

9.11 produced from genetically modified organism (if found).

9.12 In addition to the above mentioned, it shall only be indicated on sack or container if product contains at least 93% Basmati rice, if it is below than 93% Basmati word can not be used.

REFERENCES

- Codex Alimentarius 1995. Codex Standard 198-1995. Volume 7 (53-60) . (-) . -
- International Standard 1998. Rice specification 7301-1998. . -
- Indian Order No. S.O 67 – 68 (E)- Basmati rice - - -
 - Date 23 –January 2003 / /
- British code of practice for Basmati rice – July 2005 - -
- Protocol for the identification of selected Basmati Rice varieties"- Food Standards Agency, london,and CAZS, Univeristy of Wales,Bangor – February 2005. - -
- Protocol for the quantitative analysis of adulteration of basmati rice with sherati, mugad sugandha, pak 386 or superfine "- Food Standards Agency, london,and CAZS, Univeristy of Wales,Bangor – February 2006. .. - -