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Rice

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GB 1354 -- 2009

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Rice

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Foreword

The indicators for yellow-colored kernel, minerals, color and odour in Table 1 and Table 2 in Chapter 5 of this standard are mandatory. The provisions in 5.3.3 and 7.5 and chapters 8 and chapters 9 are mandatory, whereas those in other parts are recommended.

The standard is a revised version of GB 1354-1986: Rice and replaced GB 1354-1986 from its implementation date.

The standard is revised based on the previous standards and with reference to ISO 7301: 2002 Rice -- Specification and CODEX STAN 198 -- 1995 Codex Standard for Rice.

The main technical modifications in this standard compared with GB 1354 -1986 are as follows:

- Provisions are mandatory instead of mandatory in full text.
- The applicable scope of the standard is specified.
- Rice is divided into two types: high quality rice and ordinary rice.
- The terms such as chalky kernel percentage and their definitions are added.
- The definitions of broken kernel and milling degree are revised.
- Recommended indicators are added.
- The requirements on marks and labels are added.
- Judgment rules are added.

The standard is proposed by the State Administration of Grain.

The standard is under jurisdiction of the National Standardization Technical Committee of Grain and Oil.

The organizations that are responsible for the drafting of this standard are Standards & Quality Center of the State Administration of Grain, COFCO Food Science & Technology (Wuhan) Co., Ltd., Hunan Jinjian Cereals Industry Co., Ltd., and Hubei province grain and oil products quality supervision and testing station.

Main drafters of this standard are Du Zheng, Tang Ruiming, Xie Jian, Long Lingli, Zhu Zhiguang, Li Meiqin, Xie Huamin, Li Yue, Lu Qisong, Li Qisheng, Yu Dunnian, Xiong Ning, Yang Hong and Chen Debing.

This standard replaces the previous versions of the following standards:

- GB 1354 -1978
- GB 1354 -1986

Rice

1 Scope

The standard specifies the terms and definitions, classifications, quality requirements, testing methods, testing rules and requirements on packing, labels, storage and transportation.

The standard is applicable to edible commodity rice derived from paddy, unpolished rice and semi-polished rice and nor is it applicable to special rice, rice for specific use, rice of special varieties and rice with additives.

2 Normative Reference

The following standards contain provisions which, referred by this standard, constitute provisions of this standard. The subsequent modification lists (not including corrigenda) or revised versions of all reference documents with dates are not applicable to this standard. However, it is encouraged for each party entering agreement according to this standard to decide whether to use the latest versions of these documents. In addition, the latest versions of all reference documents without dates are applicable to the standard.

- GB 1350 Paddy
- GB 2715 Hygienic standard for grains
- GB/T 5009.36 Method for analysis of hygienic standard of grains
- GB/T 5490 Testing of grain and oils – General rules
- GB 5491 Testing of grain and oils Sampling and division method
- GB/T 5492 Testing of grain and oils – Determination of color, odour and taste of grain and oils
- GB/T 5493 Testing of grain and oils – Determination of type and other kind rice kernel
- GB/T 5494 Testing of grain and oils – Determination of foreign matter and unsound kernels of grain and oilseeds
- GB/T 5496 Testing of grain, oilseeds and vegetable oils
- GB/T 5497 Testing of grain and oilseeds Methods for determination of moisture content
- GB/T 5502 Testing of grain and oils – Determination of processing degree of rice and other grain kernels
- GB/T 5503 Testing of grain and oils – Determination of broken kernels
- GB 5749 Standards for drinking water quality
- GB 7718 Label of Prepackaged Food- General Rule
- GB 14881 General hygienic regulation for food enterprises
- GB/T 15682 Testing of grain and oils – Method for sensory evaluation of paddy or rice cooking and eating quality
- GB/T 15683 Rice – Determination of amylose content
- GB/T 17109 Package of grain sells
- GB/T 17891 High quality paddy

3 Terms and Definitions

The following terms and definitions are applicable to this standard.

3.1 Milling Degree

Degree of remaining rice germs and cortices remaining on the surface and in the dorsal furrows

of rice grains after milling. When preparing standard samples for milling degree, the following regulations should be applied:

- Grade 1: There is no cortex remaining in the dorsal furrows of rice grains or there are cortices remaining in the dorsal furrows of rice grains but the cortices are not in a line. In addition, the rice germs and cortices remaining on the surface of 90% samples are removed.
- Grade 2: There are cortices remaining in the dorsal furrows of rice grains and the rice germs and cortices remaining on the surface of 85% samples are removed.
- Grade 3: There are cortices remaining in the dorsal furrows of rice grains and the cortices remaining on the surface of 80% samples are not more than 1/5.
- Grade 4: There are cortices remaining in the dorsal furrows of rice grains and the cortices remaining on the surface of 75% samples are not more than 1/3.

3.2 Unsound Kernel

Unsound kernels include the following edible rice grains:

- Immature kernels: hollow kernels with opaque appearance
- Injured kernels: kernels wormed
- Spotted kernels: kernels with decayed spots on the surface
- Moldy kernels: kernels with mildew spots on the surface
- Husked rice: kernels whose cortices are not removed

3.3 Rice Bran Power

Substances filtered through a circular sieve with a hole diameter of 1.0 mm and powdery substances remaining on the sieve

3.4 Foreign Matter

Other substances except rice grains, including rice bran power, minerals, barnyard millet in husk and paddy grains

3.5 Whole Kernel

Whole kernels whose parts except germs are not damaged

3.6 Average Length

Average length value of whole kernels in samples

3.7 Broken Kernel

Incomplete kernels whose length is less than 3/4 of the average length of the samples and which remain on a circular sieve with a hole diameter of 1.0 mm

3.8 Small Broken Kernel

Incomplete kernels that pass through a circular sieve with a hole diameter of 2.0 mm but remain on a circular sieve with a hole diameter of 1.0 mm

3.9 Yellow-Colored Kernel

Kernels whose endosperms are yellow, different from the normal color of rice grains

3.10 Milled Long-Grain Non-Glutinous Rice

Rice made from milled long-grain non-glutinous paddy, whose shape is oblong or slender

3.11 Milled Medium to Short-Grain Non-Glutinous Rice

Rice made from milled medium to short-grain non-glutinous paddy, whose shape is oval

3.12 Waxy Rice

Rice made from glutinous paddy, which is divided into the following two types:

- Milled long-grain glutinous rice: rice made from milled long-grain glutinous paddy, which is of oblong or slender shape, milky white, opaque (some are translucent, called negative waxy rice),

and glutinous.

- Milled medium to short-grain glutinous rice: rice made from milled medium to short-grain glutinous paddy, which is of oval shape, milky white, opaque (some are translucent, called negative waxy rice), and glutinous.

3.13 Chalky Kernel Percentage

Percentage of the number of chalky kernels in total samples

Chalky kernel refers to rice grains with white opaque parts in endosperm, including white-belly, white-center and white-back

3.14 Taste Evaluated Value

Sum of the evaluated values of indicators such as odour, color, appearance, structure and taste after rice is cooked

3.15 Amylose Content

Percentage of the weight of amylose in total weight of samples

3.16 Other Kind Rice Kernel

Other types of rice kernels in the same rice batch

3.17 Color and Odour

Rice color, luster and odour in general of the whole batch

4 Classification

Rice is classified into milled long-grain non-glutinous rice, milled medium to short-grain non-glutinous rice and waxy rice according to different types. Waxy rice is classified into milled long-grain glutinous rice and milled medium to short-grain glutinous rice.

Rice is classified into ordinary rice and high quality rice according to edible quality.

5 Quality Requirements

5.1 Quality Indicators

5.1.1 Table 1 lists the quality indicators of rice, among which milling degree, broken kernel, small broken kernel, unsound kernel and maximum limit of foreign matters are indicators for different grades.

Table 1 Quality Indicators of Rice

Variety	Milled long-grain non-glutinous rice				Milled medium to short-grain non-glutinous rice				Milled long-grain glutinous rice			Milled medium to short-grain glutinous rice			
	1	2	3	4	1	2	3	4	1	2	3	1	2	3	
Grade	1	2	3	4	1	2	3	4	1	2	3	1	2	3	
Milling degree	Testing of degree of remaining cortices compared with standard samples														
Broken kernel	Total percentage/% ≤	15.0	20.0	25.0	30.0	7.5	10.0	12.5	15.0	15.0	20.0	25.0	7.5	10.0	12.5
	Percentage of small broken kernels/% ≤	1.0	1.5	2.0	2.5	0.5	1.0	1.5	2.0	1.5	2.0	2.5	0.8	1.5	2.3
Percentage of	3.0	4.0	6.0	3.0	4.0	6.0	3.0	4.0	6.0	3.0	4.0	6.0	3.0	4.0	6.0

unsound kernels/%										0		
Max limit of foreign matters	Total percentage/%	0.25	0.3	0.4	0.25	0.3	0.4	0.25	0.3	0.25	0.3	
	Rice bran power/%	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	
	Minerals/%	0.02										
	Barnyard millet in husk	3	5	7	3	5	7	3	5	3	5	
	Paddy kernels (number/kg)	4	6	8	4	6	8	4	6	4	6	
Moisture/% ≤		14.5			15.5			14.5			15.5	
Yellow-colored kernel/% ≤		1.0										
Other kind rice kernel/% ≤		5.0										
Color and odour		No abnormal color or odour										

5.1.2 Table 2 lists the quality indicators for high quality rice. The graded indicators of milled long-grain non-glutinous rice and milled medium to short-grain non-glutinous rice with high quality cover milling degree, broken kernel, small broken kernel, unsound kernel, chalky kernel percentage, taste evaluated value and maximum limit of foreign matters. The graded indicators for milled long-grain glutinous rice and milled medium to short-grain glutinous rice with high quality cover milling degree, broken kernel, small broken kernel, unsound kernel and maximum limit of foreign matters.

Table 2 Quality Indicators for High Quality Rice

Variety		Milled long-grain non-glutinous rice			Milled medium to short-grain non-glutinous rice			Milled long-grain glutinous rice			Milled medium to short-grain glutinous rice		
Grade		1	2	3	1	2	3	1	2	3	1	2	3
Milling degree		Testing of degree of remaining cortices compared with standard samples											
Broken kernel	Total percentage/% ≤	5.0	10.0	15.0	2.5	5.0	7.5	5.0	10.0	15.0	2.5	5.0	7.5
	Percentage of small broken kernels/% ≤	0.2	0.5	1.0	0.1	0.3	0.5	0.5	1.0	1.5	0.2	0.5	0.8
Percentage of unsound		3.0		4.0	3.0		4.0	3.0		4.0	3.0		4.0

kernels/%												0
Chalky kernel percentage/%	10.0	2	30.	10.	20.	30.	-	-	-	-	-	-
		0	0	0	0	0						
Taste evaluated value ≥	90	8	70	90	80	70	75					
		0										
Amylose content (dry basis)/%	14.0~24.0		14.0~20.0			≤ 2.0						
Maximum limit of foreign matters	Total percentage/%	0.25	0.3	0.25	0.3	0.25	0.3	0.25	0.3	0.25	0.3	
	Rice bran power/%	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	
	Minerals/%	0.02										
	Barnyard millet in husk	3	5	3	5	3	5	3	5	3	5	
	Paddy kernels (number/kg)	4	6	4	6	4	6	4	6	4	6	
Moisture/% ≤	14.5		15.5			14.5		15.5				
Yellow-colored kernel/% ≤	1.0											
Other kind rice kernel/% ≤	5.0											
Color and odour	No abnormal color or odour											

5.2 Hygienic Indicators

5.2.1 The requirements on hygienic indicators and testing shall comply with GB 2715 and relevant national regulations.

5.2.2 The requirements on plant quarantine shall comply with relevant national standards and regulations.

5.3 Hygienic Requirements in Processing and Manufacturing

5.3.1 The hygienic requirements for materials shall comply with GB 1350 and GB/T 17891.

5.3.2 The hygienic requirements for the manufacturing process shall comply with GB 14881.

5.3.3 No other substances except water that comply with GB 5749 can be added during manufacturing process.

6 Testing Methods

6.1 **Sensory Testing:** Apply methods specified in GB/T 5009.36.

6.2 **Color and Odour Testing:** Apply methods specified in GB/T 5492.

6.3 **Testing of Other Kind Rice Kernels:** Apply methods specified in GB/T 5493.

6.4 **Testing of Foreign Matters and Unsound Kernels:** Apply methods specified in GB/T 5494.

6.5 **Testing of Yellow-Colored Kernels:** Apply methods specified in GB/T 5496.

6.6 **Moisture Testing:** Apply methods specified in GB/T 5497.

6.7 **Testing of Milling Degree:** Apply methods specified in GB/T 5502.

6.8 Testing of Average Length: Choose 10 whole rice kernels randomly, lay them on a flat black surface, line them up one by one against a ruler in a head-to-head, tail-to-tail and non-overlapping way, and calculate the total length twice to ensure that the error between two results is no more than 0.5 mm. Calculate the average length as the average length of a rice kernel.

6.9 Testing of Broken Kernels: Apply methods specified in GB/T 5503.

6.10 Testing of Taste Evaluated Value: Apply methods specified in GB/T 15682.

6.11 Testing of Amylose Content: Apply methods specified in GB/T 15683.

6.12 Testing of Chalky Kernel Percentage: Apply methods specified in GB/T 17891.

7 Testing Rules

7.1 Sampling and Sample Reduction

Select and reduce samples according to GB 5491.

7.2 General Testing Rules

For details about general testing rules, see GB/T 5490.

7.3 Product Batches

The products processed from the same materials, using the same manufacturing technology and equipment, and in the same shift are considered as from the same batch.

7.4 Delivery Testing

For details about the requirements on delivery testing items, see 5.1.

7.5 Judgment Rules

7.5.1 The products that do not comply with GB 2715 and relevant national regulations on hygienic testing and plant quarantine are regarded as inedible products.

7.5.2 For ordinary rice, if any sample result fails to meet the indicator requirement for targeted grade, the rice is degraded. If sample result fails to meet the indicator requirements for lowest grade, the rice is determined as non-graded rice. If any result fails to meet the indicator requirements designed for all grades in Table 1, the rice is determined as non-graded rice.

7.5.3 For rice of high quality, if any sample result fails to meet the indicator requirement for targeted grade, the rice is degraded. If sample result fails to meet the indicator requirements for lowest grade, rice can be judged according to the requirements in Table 1. If any result fails to meet the indicator requirements designed for all grades in Table 2, the rice is determined as non-graded rice.

7.5.4 If the first testing result is unqualified, second testing with sample amount doubled is allowed. The result of the second testing is regarded as the final result.

8 Packing and Labeling

8.1 Packing

8.1.1 Packing shall comply with the regulations and hygienic requirements in GB/T 17109.

8.1.2 If packing bags are applied, the bags must be of high quality and seals must be firm.

8.2 Labeling

8.2.1 The labels on rice packing shall comply with the regulations in GB 7718.

8.2.2 The net weight marked on label should be the weight under the condition which the maximum moisture is permitted.

8.2.3 The rice products complying with this standard shall mark the names and grades on

label according to the requirements specified in this standard.

9 Storage and Transportation

9.1 Products in bags should be stored in a clean, dry, rain-resistant, moisture-resistant, insect-resistant and rodent-resistant warehouse without abnormal odour and cannot be stored with toxic and hazardous substances or substances with high moisture.

9.2 The vehicles and containers for transportation shall comply with hygienic requirements. In addition, the rice products should be prevented from raining and from being contaminated during transportation.

9.3 The quality guarantee period of rice products at room temperature should not be less than three months.

Bibliography

- [1] ISO 7301: 2002 Rice – Specification
- [2] CODEX STAN 198-1995 Codex Standard for Rice

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