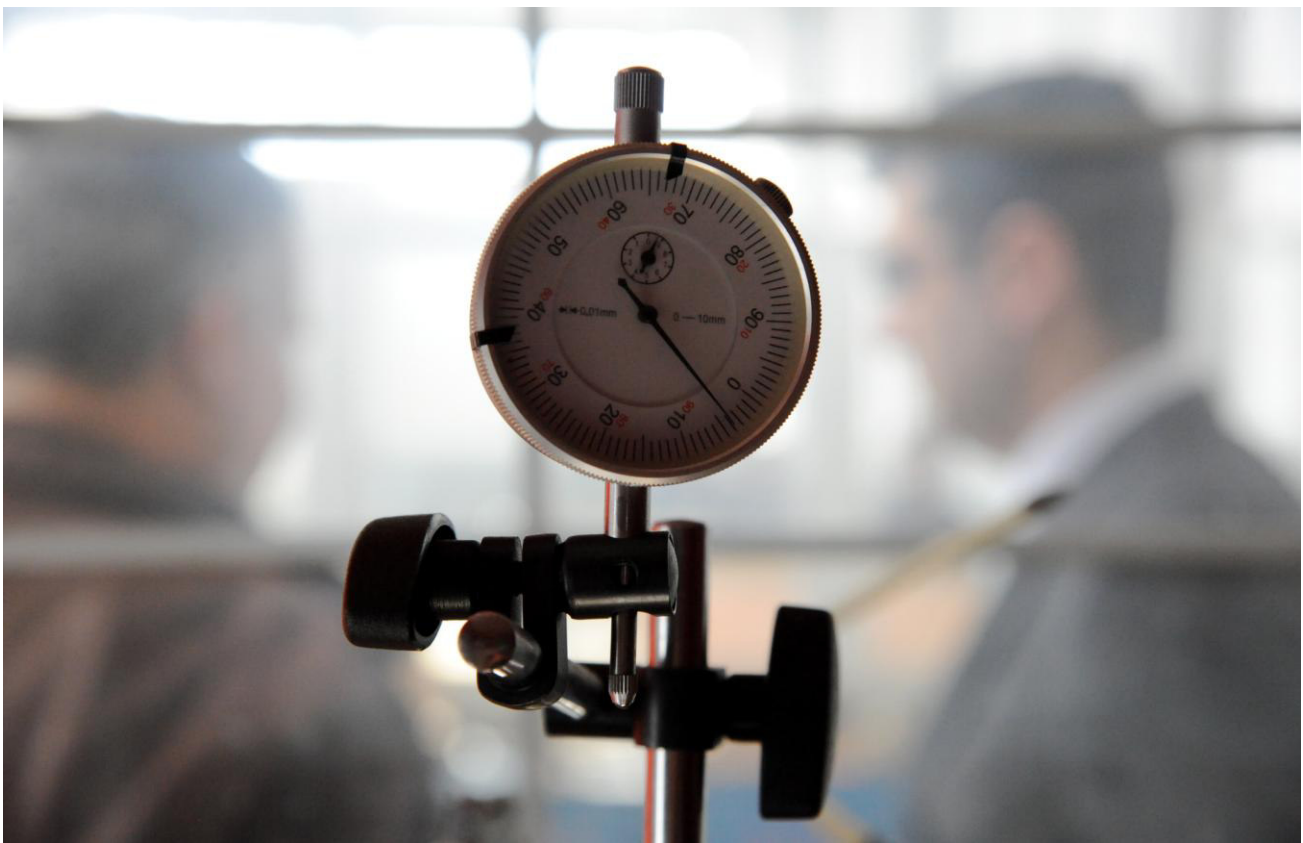


Technical Inputs



National Standard of People's Republic of China

GB/T17891-1999

High Quality Paddy

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On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)



National Standard of People's Republic of China

GB/T17891-1999

High Quality Paddy

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Approved by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)

GB/T 17891 -- 1999: High quality paddy

Foreword

In order to adapt to the reform of the grain circulation system, provide a theoretical basis to set prices based on the quality in the rice purchase and circulation process and promote adjustment of the plantation structure of grain, it is necessary to develop a national standard for high quality paddy.

This standard is developed based on GB 1350-1999: Paddy, with the feature indicators of high quality paddy added.

Annex A, Annex B and Annex C are annexes to this standard.

This standard is proposed by the State Bureau of Grain Reserves and the Ministry of Agriculture of the People's Republic of China.

The organization that is responsible for the drafting of this standard is the standard and quality management office of the State Grain Reserve Bureau; Organizations that participated in the drafting of this standard are Hubei Grain Administration, Jiangxi Grain Administration, China National Rice Research Institute, Hunan Grain Administration and Jiangsu Grain Administration.

Main drafters of this standard are Tang Ruiming, Long Lingli, Xiong Ning, Deng Yong, Luo Yukun, Li Yougen and Li Chunhua.

GB/T 17891 -- 1999: High quality paddy

No.1 Amendment List

This amendment list was approved by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) as No. [2000] 044 announcement on March 21, 2000 and has been implemented since April 1, 2000.

1. The indicators in "Editable Quality" column in Table 1 are modified.

Previous indicators:

Type	Grade	Editable Quality
		≥
Milled long-grain nonglutinous rice	1	9
	2	8
	3	7
Milled medium to short-grain nonglutinous rice	1	9
	2	8
	3	7
Milled long-grain glutinous rice		7
Milled medium to short-grain glutinous rice		7

Modified indicators:

Type	Grade	Editable Quality
		≥
Milled long-grain nonglutinous rice	1	90
	2	80
	3	70
Milled medium to short-grain nonglutinous rice	1	90
	2	80
	3	70
Milled long-grain glutinous rice		70
Milled medium to short-grain glutinous rice		70

2. The content in 5.2 “Grading” is modified as follows:

The indicators for grading are head rice rate, chalkiness percentage, amylose content and edible quality, which should meet the requirements in Table 1. Among other indicators such as husked rice yield, chalky kernel percentage, gel consistency, grain shape, unsound kernel and different varieties of grain, if two or more indicators are unqualified but not lower than the requirements of the lower grade, the rice is degraded. The rice cannot be regarded as high quality paddy if there is any indicator fails to meet the requirements of the grade 3 above.

3. The content “chalky kernels picked up according to 6.4” in 6.3 “Chalkiness Percentage” (see the last line on page 8) is modified as “chalky kernels picked up according to 6.2”.

High quality paddy

1 Scope

This standard specifies the definitions, classifications, quality requirements, testing method as well as requirements on packing, transportation and storage of high quality paddy.

This standard is applicable to the purchase, storage, transportation, processing and marketing of high quality paddy.

2 Normative Reference Documents

The following standards contain provisions which, referred by this standard, constitute provisions of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. 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 1350-1999:Paddy
- GB 1354-1986:Rice
- GB/T 5511-1985:Inspection of grain and oilseeds – Method for determination of crude protein
- GB/T 15682-1995:Rice -- Determination of cooking test quality
- GB/T 15683-1995 :Rice -- Determination of amylose content

3 Terms and Definitions

This standard adopts the following definitions.

3.1 Definition of husked rice yield, head rice, head rice rate, unsound kernel, husked rice in paddy, foreign matter, yellow-colored kernel, color and odour shall refer to the definition specified in 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12 and 3.13 of GB 1350-1999.

3.2 High Quality Paddy

Paddy produced from high quality seeds and meets the requirements of this standard

3.3 Chalkiness

White opaque parts in endosperm of rice grains, including white-belly, white-center and white-back

3.4 Chalky Kernel Percentage

Percentage of chalky kernels to the whole rice grain samples

3.5 Chalkiness Size

Percentage of chalkiness area to the projected area of the whole kernel, with the chalky kernel laid flat.

3.6 Chalkiness Percentage

Percentage of the total chalkiness size of chalky kernels to the total size of rice grain samples

Yellow-colored Kernel	%≤	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Foreign Matters	%≤	1	1	1	1	1	1	1	1
Moisture	%≤	13.5	13.5	13.5	14.5	14.5	14.5	13.5	14
Color Odour		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal

Table 1 Indicator for Grading for High Quality Paddy

5.2 Grading

The indicators for grading are head rice rate, chalkiness percentage, amylose content and edible quality, which should meet the requirements in Table 1. Among other indicators such as husked rice yield, chalky kernel percentage, gel consistency, grain shape, unsound kernel and different varieties of grain, if two or more indicators are unqualified but not lower than the requirements of the lower grade, the rice is degraded. The rice cannot be regarded as high quality paddy if there is any indicator fails to meet the requirements of the grade 3 above.

5.3 The percentage of husked rice in paddy for each type of paddy is limited below 2.0%.

5.4 Health inspection and plant quarantine shall comply with the relevant national standards and regulations.

6 Testing Method

6.1 General Testing Principles

Sampling, sample reduction as well as inspection of color, odour, foreign matters, unsound kernels, husked rice yield, yellow-colored kernels, cracked kernels, moisture, husked rice in paddy and head rice rate shall comply with requirements in 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 and 6.10 of GB 1350-1999.

6.2 Chalky Kernel Percentage

Choose 100 head rice grains randomly from processed rice samples of high quality, sort out chalky kernels and calculate the chalky kernel percentage according to formula (1). Repeat the previous operation and calculate the average value of two results, which is the final result of chalky kernel percentage.

$$\text{Chalky kernel percentage (\%)} = \frac{\text{number of chalky kernel}}{\text{total number of grain kernel}} \times 100$$

..... (1)

6.3 Chalkiness Percentage

Choose 10 (or the actual number if less than 10) chalky kernels randomly from those picked up in section 6.2. Lay the chalky kernels flat, observe and estimate the percentage of chalkiness size to the projected size of the whole rice grain one by one, and then calculate the average chalkiness size. Repeat the previous operations and the average value of the two results is the chalkiness size. The chalkiness degree is calculated according to formula (2).

$$\text{Chalkiness degree (\%)} = \text{chalky kernel percentage} \times \text{chalkiness size} \dots\dots\dots (2)$$

6.4 Extraordinary Grain Kernels

Choose 2 sample patches of paddy or husked rice randomly. Each sample consists of 100 grain kernels. Sort out grain kernels with different appearance and shape as extraordinary grain kernel, and count the number of extraordinary grain kernels. Average the number of extraordinary grain kernels from two sample patches as the value of extraordinary grain kernels.

6.5 Amylose

Inspection of amylose shall meet requirements in 8.1 of GB/T 15683 1995. Grind 10 g processed rice sample (with the milling degree of grade 1 according to national standard) by using a grinder. After filtered through a 178 um mesh sieve, the remained rice on the sieve shall be mixed and transferred into a grinding wild-mouth bottle.

Extract sample in wild-mouth bottle by using methanol in a soxhlet extractor for two hours or in a gooch extractor for two hours (5 drops/s-6 drops/s) for derosination. Scatter the samples in a plate and keep still for two hours to volatilize the remaining methanol and balance the moisture content.

6.6 Gel Consistency

Inspection of gel consistency of high quality paddy shall comply with requirements in Annex A.

6.7 Edible Quality

Inspection of edible quality of high quality paddy shall comply with requirements in Annex B.

6.8 Grain Shape Length-width Ratio

Inspection of grain shape length-width ratio shall comply with requirements in Annex C.

7 Packing, Transportation and Storage

Packing, transportation and storage of high quality paddy shall comply with the relevant national standards and regulations.

Annex A

(Annex of the standard)

Inspection Method of Gel Consistency

A1 Instruments

A1.1 High-speed grinder for samples

A1.2 Sieve with a hole diameter of 0.15 mm

A1.3 Oscillator

A1.4 Analytical scale (with a capacity of 0.0001g)

A1.5 Tube (13 mm × 100 mm) refrigerator and ice bath tank

A1.6 Bath tank of boiling water with a horizontal bench

A1.7 Level ruler and graph paper

A1.8 Glass pinball with a diameter of 1.5 cm

A1.9 Paddy huller and mill for laboratory

A2 Reagents

A2.1 0.025% thymol blue ethanol solution

Dissolve 125 mg thymol blue with 500 mL 95% ethanol solution.

A2.2 0.2 mol/l potassium hydroxide solution

A3 Operation Method

A3.1 Sample Preparation

Place processed rice sample (with the milling degree of grade 1 according to national standard) in room temperature for at least two days to balance moisture. Weigh 5 g samples and grind them into powder, filter the powder through a sieve with a hole diameter of 0.15 mm and store the powder into a wide-mouth bottle.

A3.2 Determination of Moisture in Rice Powder

Moisture in rice powder is determined according to GB 1350.

A3.3 Sample Dissolving and Gel Making

Weigh two sample patches of rice powder stored in the bottle, 100 mg for each sample (12% of the sample is water, if less than 12%, increase or decrease the weight of the sample). Place a sample into a tube; add 0.2 ml 0.025% thymol blue solution, and slightly shake the tube to fully scatter rice powder. Then add 2.0 mL 0.2 mol/l potassium hydroxide solution, shake the tube, and place the tube on a vortex to mix the rice powder completely. Then put the tube in bath tank with boiling water, cap the tube with a glass pinball and heat the tube for 8 min. Maintain the gel solution surface in the tube lies between 1/3 and 1/2 of the tube when heating. After heating, take out the tube from boiling water and remove the glass pinball. Still the tube for 5 min, bath the tube in ice water with the temperature around 0°C for 20 min and take out the tube.

A3.4 Still the Tube Horizontally

Take out the tube from ice water, immediately put it horizontally on the graph paper laid on a horizontal operation bench, and still it for 1 h at room temperature of $25\pm 2^{\circ}\text{C}$.

A3.5 Measurement of Gel Length

Measure the length (mm) of the gel flowing in the tube. Repeat the operation procedures above with another sample. Ensure that the difference between the two test results does not exceed 7 mm. Average the two results as the final gel length.

Annex B

(Annex of the standard)

Inspection Method of Edible Quality

B1 Instruments

B1.1 Steamed rice cooker

B1.2 Aluminum box with a lid (more than 60 ml)

B1.3 Chopsticks

B1.4 Score sheet

B2 Sample Milling Degree

The milling degree of the sample should comply with requirements of top-grade rice in GB 1354 -- 1986.

B3 Rice Preparation

Rice preparation should comply with requirements in 6.2 of GB/T 15682 – 1995.

B4 Evaluation Requirements

Evaluation should comply with requirements in 7.3 of GB/T 15682 – 1995.

B5 Taste Evaluation

B5.1 Taste Evaluation Procedure

Evaluate the odour, appearance, palatability and cold rice texture in order. Open the lid of the cooker upon finishing, identify whether the cooked rice contains its flavor, observe the color and grain structure of the rice, and identify the softness, viscosity and taste of the rice by chewing and tasting it. One hour later, evaluate quality of cold rice by checking the softness, looseness and stickiness of rice.

B5.2 Scoring

Inspector scores the edible quality of rice through tasting based on 4 indicators listed in Table B1. The total score is 100.

Table B1 Scoring of Edible Quality

Inspector:		Year-Month-Date		
Odour	Appearance	Palatability	Cold Rice Texture	Total Score
15	15	60	10	100

High quality paddy of the same typical type should be chosen for scoring and its reasonable scores can be regarded as reference.

B5.3 Calculation of Scores

Average the total score of all samples as the final score of edible quality.

Annex C

(Annex of the standard)

Inspection Method of Grain Shape (Length-width Ratio)

C1 Instruments and Tools

C1.1 Measuring board (A flat board with black panne velvet stuck on surface)

C1.2 Ruler

C1.3 Tweezers

C2 Measurement Method

C2.1 Choose 10 kernels of whole processed rice (with the milling degree of grade 1 according to national standard) randomly, place them in a line one by one, head-to-head, tail-to-tail on the measuring board without overlapping or gapping, and then measure the length of line against the ruler. Measure twice to ensure the difference between two results is no more than 0.5 mm. Average the two results as the final length of processed rice.

C2.2 Change the formation of measured rice kernels in C2.1 into a line one by one, side by side. Measure the width of the line with a ruler. Measure twice to ensure the difference between two results is no more than 0.3 mm. Average the two results as the final width of processed rice.

C3 Calculation

Calculate the grain shape (length-width ratio) according to formula C1:

$$\text{Length-width ratio} = \text{length}/\text{width} \dots\dots\dots (\text{C1})$$

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