

འབྲུག་གི་ཚུལ་གྱི་གནས་ཚད། - ཁ་གསལ།

BHUTAN STANDARD

Rice - Specification



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འབྲུག་གི་རྒྱལ་གྱི་གནས་ཚད། - ཁ་གསལ།

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FOREWORD

This Bhutan Standard for Rice – Specification was developed by Bhutan Standards Bureau after the draft finalized by the Food and Agriculture Technical Committee, TC 02 and approved by the Bhutan Standards Bureau Board (BSB Board) on [Day Month](#) 2020.

The standard is drafted in accordance with the BSB Rule for Structure and Drafting of Bhutan Standards, 2017. Some of the elements of this standard may be the subject of copyrights. BSB shall not be held responsible for such copyrights. The annex A-E form the normative part of this standard.

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Any suggestions and further information may be directed to the concerned Technical Committee.

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Introduction

Rice (*Oryza sativa* L.) is one the most important food crops in Bhutan. It constitutes main source of carbohydrates and in general consumed about three times a day. The per capita consumption of rice is approximately 149 kg milled rice per year. However, the domestic production meets approximately 50% of the country's requirement, and rest is imported, mainly from India. Though Bhutan imports over 50% of its rice requirements, there is tremendous potential in improving the domestic rice trade in the country. The formal rice trade is small; however, it is expected that the standards for quality and safety would further transform the market forces in addition to ensuring that domestically traded rice is safe. Furthermore, the standards would help streamline the import of rice from neighbouring countries by defining the quality and safety parameters for different type of rice traded regionally.

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BHUTAN STANDARD FOR RICE-SPECIFICATION

1 Scope

This Bhutan standard specifies minimum specifications for rice (*Oryza sativa* L.) applicable to the following types: milled rice, husked rice (brown rice) and parboiled rice intended for human consumption. Rice includes both non glutinous and glutinous varieties. The scope excludes red rice varieties grown in Bhutan and the products derived from rice.

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.

ISO 712 *Cereals and cereal products -- Determination of moisture content -- Reference method*

ISO 6579-1 *Microbiology of the food chain -- Horizontal method for the detection, enumeration and serotyping of Salmonella -- Part 1: Detection of Salmonella spp.*

ISO 7251 *Microbiology of food and animal feeding stuffs - Horizontal method for the detection and enumeration of presumptive Escherichia coli – Most probable number technique*

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*

ISO 6888-1 *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 6888-2:1999 *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 24333 *Cereals and cereal products-Sampling*

AOAC 991.31 *Aflatoxins in corn, raw peanuts, and peanut butter. Immunoaffinity column (Aflatest) Method*

AOAC 991.44 *Ochratoxin A in corn and barley. Liquid chromatographic method*

IS:5403 *Method for yeast and mould count of foodstuffs and animal feeds (First revision)*

IS:5887-2 *Method for detection of bacteria responsible for food poisoning, Part-2: Isolation, identification and enumeration of Staphylococcus aureus and Faecal streptococci (First revision)*

IS:5887-1 *Method for detection of bacteria responsible for food poisoning, Part-1: Isolation, identification and enumeration of Escherichia coli*

IS:5887-3 *Method for detection of bacteria responsible for food poisoning, Part-3: General guidance on methods for the detection of Salmonella*

CODEX. STAN 193-1995 *General standard for contaminants and toxins in food and feed*

BTS 139:2019 SARS 00014: 2018 *Bhutan standard for food hygiene-General principles-Code of practice*

BTS 268:2020 CODEX STAN 1-1995 *General standard for the labelling of prepackaged foods.*

3 Terms and definition

For the purposes of this document, the following terms and definitions apply;

3.1 Broken kernel

Rice kernel with length less than 7.5 parts (75 percent) of whole rice kernel

3.2 Chalky kernel

Rice kernel wholly or partially has a chalky, non-transparent appearance

3.3 Damaged kernel

Head rice or broken kernel showing evident deterioration due to moisture, pests, disease or other causes, but excluding heat-damaged kernels

3.4 Discoloured kernel

Rice kernel of which 25% or more of the surface area has become discoloured

3.5 Foreign matter

Matter other than rice, including husk and bran detached from rice kernel, organic and inorganic and extraneous matter

3.6 Heat-damaged kernel

Rice kernel that has changed its normal colour as a result of microbiological heating

3.8 Husked rice

Husked (brown/cargo) rice from which only the husk has been removed. Brown rice is unpolished rice, which has been milled to remove the hull from the kernel but retain the rice bran layer and the germ.

3.9 Milled (White) rice

Grades of husked (brown/cargo) rice from which the bran and embryo have been removed to various degrees by milling

3.9.1 Under-milled rice

Milled rice obtained by milling the husked rice, but not to the degree necessary to meet the requirements of well-milled rice

3.9.2 Well-milled rice

Milled rice obtained by milling husked rice in such a way that most of the bran and embryo have been removed

3.10 Paddy

Rice in its husk after threshing or rice that is not yet dehusked or rice with its husk intact after threshing

3.11 Parboiled rice

Paddy or husked rice that has been soaked in water and subjected to a heat treatment so that the starch is fully gelatinized, followed by a drying process prior to milling

3.12 Rice

Rice includes cargo rice, white rice, glutinous rice, non-glutinous and boiled rice, whether it is whole grain, head rice, big broken, broken or small broken

3.13 Sieves/rice grader

The sheet of any materials 'fit for purpose' perforated with round holes of different diameters

3.14 Waxy rice

Glutinous rice varieties whose kernels have a white and opaque appearance.

4 Requirements

4.1 Essential composition and quality factors

4.1.1 Quality factors – General

Rice shall be clean, free from abnormal flavours, odours and live insects. It shall be safe and suitable for human consumption.

4.1.2 Quality factors – Specific

4.1.2.1 The moisture content of the rice shall be $\leq 14\%$ (m/m)

4.1.2.2 The defects tolerance for the different categories of rice shall not exceed the limits given in Annex A, tables 1 to 3.

4.2 Contaminants

4.2.1 Heavy metal

Rice shall conform to those maximum levels as established by the Codex Alimentarius Commission in CODEX STAN 193-1995.

4.2.2 Pesticide residues

Rice shall conform to those maximum residue limits established by the Codex Alimentarius Commission.

4.2.3 Microbiological

Rice shall conform to microbiological acceptable limits specified in Annex B, table 1. The methods quoted are recommended, however the laboratories may use other validated test methods.

4.2.3.1 Mycotoxins

Rice shall conform to maximum levels specified Annex B, table 2. The methods quoted are recommended, however the laboratories may use other validated test methods

4.3 Hygiene

Rice shall be processed and packed as per BTS 139:2020 SARS 0014:2018 *Bhutan standard for food hygiene – General practices – Code of practice.*

5 Methods of sampling and analysis

5.1 Sampling

Sampling shall be carried out in accordance with ISO 24333 or any internationally accepted methods

5.3 Moisture Content

Moisture content shall be determined in accordance with ISO 712

6 Test report

6.1 The test report shall show the method used and the result obtained. The report shall include all details required for the complete identification of the sample, and in particular the date on which the analysis was carried out.

7 Packaging, transportation and storage

The following shall be met in packaging, transportation and storage.

7.1 Packaging

The product shall be packed in a 'fit for purpose' packaging with adequate barrier and strength properties to withstand handling and storage during the declared shelf life.

7.3 Storage

The rice shall retain the characteristics attributes for a minimum of 6 months from the date of manufacture when stored in warehouses constructed and used in such a way as to keep their moisture content sufficiently low, consistent with local conditions.

8 Labelling

8.1 The labelling shall be carried out in accordance with BTS 268:2020 CODEX STAN 1-1985 *General standards for labelling of prepackaged foods*.

Annex A

(Normative)

Table 1 – Specification for husked (cargo/brown) rice

| S/N | Characteristics | Requirements | | | Reference method |
|-----|--|--------------|-----|-----|-------------------------------|
| | | G1 | G2 | G3 | |
| 1 | Broken, %, max mass fraction | 7 | 10 | 15 | Rice grader or sieve analysis |
| 2 | Damaged rice, %, max mass fraction | 1 | 1.5 | 2 | Visual examination |
| 3 | Foreign matter, % max mass fraction (Organic /Inorganic) | 0.2 | 0.4 | 0.8 | Visual examination |
| 4 | Paddy grains, No./kg (max) | 10 | 15 | 20 | Visual examination |
| 5 | Chalky %, max mass fraction | 4 | 6 | 8 | Visual examination |
| 6 | Live Weevils | Nil | Nil | Nil | Visual examination |
| 7 | Discoloured grain %, max mass fraction | 1 | 2 | 3 | Visual examination |

Table 2 – Specification for milled (white) rice

| S/N | Characteristics | Requirements | | | Reference method |
|-----|--|--------------|-----|-----|-------------------------------|
| | | G1 | G2 | G3 | |
| 1 | Broken, %, max mass fraction | 7 | 10 | 15 | Rice grader or sieve analysis |
| 2 | Damaged rice, %, max mass fraction | 0.5 | 1 | 1.5 | Visual examination |
| 3 | Foreign matter, % max mass fraction (Organic /Inorganic) | 0.2 | 0.4 | 0.8 | Visual examination |
| 4 | Paddy grains, No./kg (max) | 5 | 10 | 15 | Visual examination |
| 5 | Chalky %, max mass fraction | 3 | 5 | 7 | Visual examination |
| 6 | Under milled, % max mass fraction | 3 | 5 | 7 | Visual examination |
| 7 | Live Weevils | Nil | Nil | Nil | Visual examination |
| 8 | Discoloured grain, %, max mass fraction | 1 | 2 | 3 | Visual examination |

Table 3 – Specification for milled parboiled rice

| S/N | Characteristics | Requirements | | |
|-----|---|--------------|-----|-----|
| | | G1 | G2 | G3 |
| 1 | Broken, %, max mass fraction | 4 | 6 | 8 |
| 2 | Damaged rice, %, max mass fraction | 1 | 2 | 3 |
| 3 | Red or red streaked, %, max mass fraction | 1 | 2 | 3 |
| 4 | Foreign matter, % max mass fraction (Organic /Inorganic) | 0.2 | 0.4 | 0.8 |
| 5 | Paddy grains, No./kg (max) | 5 | 10 | 15 |
| 6 | Under milled, % max mass fraction | 3 | 5 | 7 |
| 7 | Live weevils | Nil | Nil | Nil |
| 8 | Discoloured grain, %, max mass fraction | 2 | 3 | 5 |

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Annex B

(Normative)

Table 1 – Microbiological requirement for rice

| S/N | Characteristics | Limits | Test methods |
|-----|----------------------------------|-----------------|---------------------------------|
| 1 | Yeast and mould, cfu per g max | 10 ⁴ | ISO 21527-2 IS:5403 |
| 2 | <i>S. aureus</i> , per g max | Absent | ISO 6888 – 1 and 2 IS:5887-2 |
| 3 | <i>E. coli</i> , per g max | Absent | ISO 7251 IS:5887-1 |
| 4 | <i>Salmonella</i> , per 25 g max | Absent | ISO 6579-1 IS:5887-3 |

Table 2 – Aflatoxin requirement for rice

| S/N | Characteristics | Limits | Test methods |
|-----|-------------------------|--------|--------------|
| 1 | Total aflatoxins, mg/kg | 15 | AOAC 991.31 |
| 2 | Aflatoxin B1, mg/kg | 10 | |
| 3 | Ochratoxin A, mg/kg | 20 | AOAC 991.44 |

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