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BHUTAN STANDARD

Mandarin-Specification



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BHUTAN STANDARDS BUREAU

The National Standards Body of Bhutan

Thimphu 11001

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Director General
Bhutan Standards Bureau
Rijug Lam
Thimphu-11001
Tel: 00975-2-325104/325401
Fax: 00975-2-323712/328298
Web: www.bsb.gov.bt

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FOREWORD

Bhutan Standards Bureau (BSB) is a National Standards Body (NSB) of Bhutan. This standard for Mandarin was developed by Technical Committee TC02, Food and Agriculture, Subcommittee SC 15, Fruits and Vegetables under Bhutan Standards Bureau after the draft finalization by the Food and Agriculture Technical Committee, TC 02 and approved by the Bhutan Standards Bureau Board (BSB Board) on xth Month August 2023.

This standard specifies requirements for grading, packaging and labelling for mandarin. This standard is drafted in accordance with the BSB Rule for Structure and Drafting of Bhutan Standards, 2018. Some of the elements of this standard may be the subject of copyrights.

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Amendments are issued to standards as the need arises on the basis of comments.

INTRODUCTION

Citrus is the common term used for Genus, a flowering plant of rue family, Rutaceae. It falls under subfamily Aurantioideae and tribe Citreae. The natural and commercially cultivated citrus include oranges, grapefruits, lemons, lime and tangerines. Currently citrus is grown over 140 countries in the world. It is the highest valued fruits in the international market. Citrus is also known for its nutritional value. Indeed, citrus has become very important commodity across the globe. Citrus is number one horticultural crop of Bhutan. Citrus is the highest income generating fruit crop. Further it is identified as one among four important agricultural commodities (rice, maize, potato and citrus). Citrus in Bhutan is predominantly mandarin (*Citrus reticulata* Blanco.) although lemons, lime and grapefruits are also produced. Mandarin in Bhutan are reported to be of two types: Sikkim (Cultivated in northeastern Himalayan state of West Bengal, India) and Khasi Cultivated in Khasi hills of Meghalaya, India. Among the three species of citrus in Bhutan: Local Mandarin (*Citrus reticulata* Blanco.), Citrus (*Citrus aurantifolia*) and lemons (*Citrus limon*), only local mandarin (*Citrus reticulata* Blanco.) is produced in commercial scale. Since there is no national standard on Mandarin, the need for standard was felt necessary to address emerging issues mainly to maintain quality parameters and facilitate trade.

The use of standards remains voluntary and when referenced by regulatory authorities as a basis for legislations, the standards become mandatory.

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BHUTAN STANDARD

Mandarin-Specification

1 Scope

This standard applies to commercial varieties of mandarin from *Citrus reticulata Blanco* of the Rutaceae family to be supplied fresh to the consumer after sorting, grading and packaging. Mandarin for industrial processing are excluded.

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.

CAC/RCP 44-1995 *Code of practice for packaging and transport of fresh fruit and vegetables*

BTS 139:2020 SARS 0014:2018, *Food hygiene- General principles – Code of practice*

BTS 269 CXS 1 (Amended 2009) *General guidelines on claims*

3 Terms and Definition

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

3.1 Extraneous Matter

Any foreign substances in fruits associated with objectionable condition or practices in production, storage and/or distribution of fruits.

3.2 Contaminants

Any biological or chemical agent, foreign matter or other substances not intentionally added to fruits which may compromise fruits safety or suitability.

3.3 Mandarin

Mandarin is a fruit from *Citrus reticulata Blanco* of the Rutaceae family.

4 Description

4.1 Shape and Color

In general, mandarin (Orange) fruits have a bright orange color when they are ripe and ready to eat. They are round in shape and slightly flattened at the bottom.

5 Hygiene

The mandarin shall be handled in accordance with the provision in BTS 139: 2020 SARS 0014: 2020.

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6 Contaminants

6.1 The produce covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission (FC 0003) or any other relevant national regulation.

6.2 The produce covered by this Standard shall comply with the maximum levels of the contaminants and toxins in accordance with the General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995) or any other relevant national regulation.

7 Quality Requirement

7.1 Whole

The produce shall not have any part removed nor have suffered any damage making them incomplete.

7.2 Appearance

The produce shall be clean, fresh, firm and free from any visible extraneous matter.

7.3 Pests and Diseases

The produce shall be free from pests and diseases.

7.4 External Moisture

The produce shall be free from external moisture; except condensation following removal from cold storage.

7.7 Odour

The produce shall have characteristic mandarin odour and be free from foreign odour.

7.8 Defects

The produce shall be:

7.8.1 free from handling injuries such as bruise, scars, punctures and open stalk-ends

7.8.2 free from signs of internal shriveling and dehydration.

7.9 Maturity Requirements

7.9.1 Minimum total soluble solids content shall not be less than 7.5% or TSS: acid ratio shall not be less than 12:1.

7.9.2 The development and state of maturity of the mandarin shall be such as to enable them to continue their ripening process and to reach satisfactory degree of ripeness.

7.10 Color

The mandarin shall attain full coloration or at least 2/3 of the surface area at the time of marketing.

8 Sizing

Size should be determined by the equatorial diameter (means the maximum distance taken from the right angle on the largest axis of the fruit as depicted in Table-1.

Table 1- Sizing of Mandarin

Size Code	Equatorail Diameter (mm)
A	>55
B	40-55
C	<40

9 Classification

The classification of mandarin shall be done in accordance provision concerning tolerance given below in table_1.

9.1 Class I

Mandarin in this class must be of superior quality. They must be characteristic of the variety and/or commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality and the keeping quality and presentation in the package.

9.2 Class II

Mandarin in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects in shape;
- slight defects in coloring;
- slight skin healed defect due to mechanical causes.

9.3 Class III

This class includes mandarins which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements. The following defects may be allowed, provided the mandarins retain their essential characteristics as regard the quality, the keeping quality and presentation:

- defects in shape;
- defects in coloring;
- healed skin defects due to mechanical causes.

Table 2- Quality tolerance of Mandarin

S.No.	Quality Tolerances	Percentage of defective produce, by number or weight		
		Class I	Class II	Class III
1	Quality Tolerances for mandarin not satisfying the minimum requirements including defects of which no more than: <i>Defects:</i> - bruise, scars, punctures and open stalk-ends - <i>internal shriveling and dehydration.</i> - <i>deformed/irregular shapes</i> - <i>Non uniformity in color</i>	5	10	15
2	Size tolerances			
	Corresponding to the size immediately above and/or below that indicated on the package as per the provision concerning sizing.	10	10	10

10 Sampling

Random sampling shall be done as per any international/national accepted sampling methods.

11 Test Methods

Laboratory may use any validated method of analysis.

12 Packaging

12.1 The produce shall be packed in such a way as to protect the produce properly.

12.2 The materials used for packing shall be clean and of a quality such as to avoid causing any external or internal damage to the produce.

12.3 The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic materials.

12.4 The produce should be packed in compliance with appropriate section of CAC/RCP 44-1995.

12.5 The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the mandarins. Packing material (or lot for produce presented in bulk) shall be free of all foreign matter and odour.

12.6 Labelling

Package shall be labelled as “Mandarin” and it shall conform to the provisions provided as hereunder. Each package shall bear the following particulars in letters grouped on the same side Legibly and indelibly marked and visible from the outside:

12.6.1 Identification

Packers and/or dispatcher name and address or officially issued or accepted code mark.

12.6.2 Name of Produce

13.3 Date of Packing (Optional)

13.4 Size Code

13.5 Net Weight (Optional)

13.6 Origin of produce

13.7 Class

13.8 Official inspection/certification mark (optional)

14 Storage and Transport

14.1 The produce shall be stored in well protected structure from the sun, rain and excessive heat. In addition, the store should be dry, well ventilated, free from foreign odours and insects/ rodents proof.

14.2 The packages should be handled and transported in such a way that they are protected from rain, from the sun or other sources of excessive heat, from foreign odours and from any other contamination.

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FOOD AND AGRICULTURE TECHNICAL COMMITTEE (TC 02)

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Bhutan Agriculture and Food Regulatory Authority, Thimphu	Mr. Kubir Nath Bhattarai (Alternate)
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Bhutan Agro Industries Limited, Thimphu	Mrs. Jigme Wangmo (Alternate)
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Department of Agriculture, Ministry of Agriculture and Forests, Thimphu	Mr. Jimba Rabgyel (Alternate)
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Department of Agricultural Marketing and Cooperatives, Ministry of Agriculture and Forests, Thimphu	Mr. Jamyang Lophyal (Alternate)
Department of Industry, Ministry of Economic Affairs, Thimphu	Mr. Tashi Dorji
National Post Harvest Centre, Paro	Mr. Dechen Tshering
Office of Consumer Protection, Ministry of Economic Affairs, Thimphu	Mr. Jigme Dorji
Office of Consumer Protection, Ministry of Economic Affairs, Thimphu	Chencho Zangmo (Alternate)
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Member Secretary
Cheki Zangmo
Standardization Division
Bhutan Standards Bureau

Subcommittee on Fruits and Vegetables (TC02/SC15)

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Member Secretary
Kesang P Namgay
Standardization Division
Bhutan Standards Bureau