

འབྲུག་གུ་ལིའི་གནས་ཚད། དབྱེ་རིམ་དང་སྡེ་རིམ།

DRAFT BHUTAN STANDARD

Avocado – Classification and Grading



JCS 67.080.01

© Copyright 2024

BHUTAN STANDARDS BUREAU

The National Standards Body of Bhutan

THIMPHU 11001

འབྲུག་གུ་ལིའི་གནས་ཚད། དབྱེ་རིམ་དང་ལྗོངས་རིམ།

DRAFT BHUTAN STANDARD

Avocado – Classification and Grading

DRAFT BHUTAN STANDARD FOR THE PURPOSE OF WIDE CIRCULATION

PDF disclaimer

This PDF may contain embedded typefaces. In accordance with Adobe's Licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The Bhutan Standards Bureau accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

COPYRIGHT PROTECTED DOCUMENT

© BSB 2024

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from BSB at the address below in the country of the requester.

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

Table of Contents

FOREWORD	iv
Introduction.....	v
Avocado – Classification and Grading	1
1 Scope	1
2 Normative References	1
3 Terms and Definitions	1
3.1 Classification	1
3.2 Grading.....	1
3.3 Parthenocarpic Fruit.....	1
3.4 Sound	1
4 Minimum Requirements	1
4.13 Maturity Requirements	2
5 Classification	2
6 Grading	3
7 Tolerances	4
7.1 General.....	4
7.2 Quality Tolerances	4
7.3 Size Tolerances.....	4
8 Presentation	4
8.1 Uniformity	4
8.2 Packaging.....	4
8.3 Labelling	4
9 Sampling	5
10 Requirements for Contaminants	5
11 Hygiene.....	5
Bibliography	6

FOREWORD

This Bhutan Standard for Avocado-Classification and Grading was adopted 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 Date Month Year.

This standard is subjected 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.

DRAFT BHUTAN STANDARD FOR THE PURPOSE OF WIDE CIRCULATION

Introduction

Avocado (*Persea americana*) is an important edible fruit of flowering plant family, Lauraceae and is native to South-central Mexico. In Bhutan, Avocado is grown from 600m to 1800m above mean sea level. It can be classified into Mexican, Guatemalan, and West Indian races. The avocado fruits have single seeds and come in various shapes such as round, pear-shaped, or oblong and the fruit skins too vary in texture and color. The released varieties of avocado in Bhutan are Bajo-Gule-1 and Bajo-Gule-2. Presently, avocado is emerging as a promising commercial crop in Bhutan, offering an alternative to citrus mandarin owing to its taste and high nutritive value.

The use of standard remains voluntary and when referenced by regulatory authorities for implementation, the standards become mandatory.

འབྲུག་གུ་ལིའི་གནས་ཚད། དཔྱད་རིམ་དང་སྒྲེ་རིམ།

DRAFT BHUTAN STANDARD

Avocado – Classification and Grading

1 Scope

This standard shall specify requirements for commercial varieties of fresh avocado fruits (*Persea americana* Mill.) of the *Lauraceae* family intended for consumer consumption following preparation and packaging.

Parthenocarpic avocados and avocados for industrial processing are excluded.

2 Normative References

The following 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 applies including amendments.

CAC/RCP 44-1995, *Code of Practice for the Packaging and Transport of Fresh Fruits and Vegetables*

CODEX STAN 1-1985, Rev. 1-199, *Codex General Standard for the Labelling of Prepackaged Foods*

CODEX STAN 193-1995, *Codex General Standard for Contaminants and Toxins in Food and Feed*.

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

3 Terms and Definitions

For the purpose of this standard, the following terms and definitions shall apply:

3.1 Classification

Grouping item into categories or classes based on shared quality.

3.2 Grading

Assessing and assigning a numerical or descriptive rating to produce.

3.3 Parthenocarpic Fruit

Seedless fruits formed without fertilization.

3.4 Sound

Produce not affected by rotting or deterioration making it unfit for consumption.

4 Minimum Requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the avocados:

4.1 Shall be whole.

4.2 Shall be sound.

4.3 Shall be clean, practically free of any visible foreign matter.

4.4 Shall be practically free of pests and damage caused by them affecting the general appearance of the produce.

4.5 Shall be free of abnormal external moisture, excluding condensation following removal from cold storage.

4.6 Shall be free of any foreign smell and/or taste.

4.7 Shall be practically free of damage caused by low and/or high temperatures.

4.8 Having a stalk not more than 10 mm in length which shall be cut off cleanly. However, its absence is not considered a defect on condition that the place of the stalk attachment is dry and whole.

4.9 The avocados shall have reached a stage of physiological development which will ensure the completion of the ripening process, in accordance with criteria proper to the variety and to the area in which they are grown.

4.10 The mature fruit should be free of bitterness.

4.11 The development and condition of the avocado shall be such as to enable it to withstand transportation and handling.

4.12 When avocado reach their destination, they shall be in a satisfactory condition.

4.13 Maturity Requirements

4.13.1 The fruit shall have a minimum dry matter content at the harvest, according to the variety, to be measured by drying to constant weight:

- a)** 21% for the variety Hass,
- b)** 20% for the varieties Torres, Fuerte, Pinkerton, Edranol and Reed.
- c)** other varieties including Antillean/West Indian/Guatemalan may show a lower dry matter content.

Note: This requirement applies to a fruit lot and not to individual fruits.

5 Classification

Avocados are classified in three classes defined below:

5.1 Extra Class

5.1.1 Avocados in this class shall be of superior quality.

5.1.2 They shall be characteristic of the variety.

5.1.3 They shall 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, the keeping quality and presentation in the package.

5.1.4 If present, the stalk shall be intact.

5.2 Class I

5.2.1 Avocados in this class shall be of good quality.

5.2.2 They shall be characteristic of the variety.

5.2.3 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:

- a)** slight defects in shape and colouring.
- b)** slight skin defects (corkiness, healed lenticels) and sunburn; provided they are not progressive; the maximum total area should not exceed 4 cm².

5.2.4 The defects shall not, in any case, affect the flesh of the fruit.

5.2.5 The stalk, if present, may be slightly damaged.

5.3 Class II

This class includes avocados which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in clause 4.

5.3.1 The following defects, however, may be allowed, provided the avocados retain their essential characteristics as regards the quality, the keeping quality and presentation:

- a)** defects in shape and colouring.
- b)** skin defects (corkiness, healed lenticels) and sunburn; provided they are not progressive; the maximum total area should not exceed 6cm².

5.3.2 The defects shall not, in any case, affect the flesh of the fruit.

5.3.3 The stalk, if present, may be damaged.

6 Grading

Avocados can be sized through one of the following options:

6.1 By weight of the fruit, in accordance with table 1:

Table 1 – Grading according to the weight

Size Code	Weight (grams)
2	> 1220
4	781 – 1220
6	576 – 780
8	456 – 576
10	364 – 462
12	300 – 371
14	258 – 313
16	227 – 274
18	203 – 243
20	184 – 217
22	165 – 196
24	151 – 175
26	144 – 157
28	134 – 147
30	123 – 137

32	80 – 123 (only Hass type)
----	---------------------------

6.1.1 The minimum weight for avocados of Antillean/West Indian/Guatemalan and other not defined varieties is 170 g.

6.2 By count

To ensure uniformity in size between produce in the same package when they are sized by count, the weight of the smallest fruit shall be not less than 75% of the weight of the largest fruit in the same package.

7 Tolerances

7.1 General

Tolerances in respect of quality shall be allowed in each package (or in each lot for produce presented in bulk) for produce not satisfying the requirements of the class indicated.

7.2 Quality Tolerances

7.2.1 “Extra” Class

Five percent by number or weight of avocados not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

7.2.2 Class I

Ten percent by number or weight of avocados not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class. Included therein shall be allowed not more than 1% for avocados affected by decay.

7.2.3 Class II

Ten percent by number or weight of avocados satisfying neither the requirements of the class nor the minimum requirements, with the exception of avocados affected by decay that may not be more than 2%.

7.3 Size Tolerances

For all classes, 10% by number or weight of avocados corresponding to the size immediately above or below that indicated on the package.

8 Presentation

8.1 Uniformity

The contents of each package shall be uniform and contain only avocados of the same origin, variety, quality and size. The visible part of the contents of the package shall be representative of the entire contents.

8.2 Packaging

8.2.1 Avocados shall be packed in such a way as to protect the produce properly.

8.2.2 Avocados shall be packed in each package in compliance with the *Code of Practice for the Packaging and Transport of Fresh Fruits and Vegetables* (CAC/RCP 44).

8.2.3 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 ink or glue.

8.2.4 Stickers individually affixed to the produce shall be such that, when removed, they neither leave visible traces of glue nor lead to skin defects. Information lasered on single fruit should not lead to flesh or skin defects.

8.3 Labelling

In addition to the requirements of the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985, Rev. 1-1991), the following specific provisions apply:

- 8.3.1** The name of the product or variety.
- 8.3.2** The trademark or brand name, if any.
- 8.3.3** The name and address of the producer and/or packer and/or distributor.
- 8.3.4** The code or lot number.
- 8.3.5** The net mass or gross mass.
- 8.3.6** The class of product.
- 8.3.7** Size expressed in minimum and maximum weight in grams or by number (by count).
- 8.3.8** The producing country.
- 8.3.9** Date of packaging.
- 8.3.10** Any other marking required by the purchaser.
- 8.3.11** A reference to this document, i.e. BTS (optional).

9 Sampling

Sampling methods to be used for ascertaining conformance to the requirements of this specification shall be in accordance with internationally accepted methods or national methods recognized internationally.

10 Requirements for Contaminants

10.1 The produce shall comply with the maximum levels of the Codex General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995).

10.2 The produce shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

10.3 The produce should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

11 Hygiene

The manufacturer shall comply in accordance with BTS 139: 2020 SARS 0014: 2018, *Food hygiene- General principles – Code of practice*.

Bibliography

CAC/RCP 44-1995, *Code of Practice for the Packaging and Transport of Fresh Fruits and Vegetables*.

CODEX STAN 1-1985, Rev. 1-199, *Codex General Standard for the Labelling of Prepackaged Foods*.

CODEX STAN 193-1995, *Codex General Standard for Contaminants and Toxins in Food and Feed*.

Codex Stan 197-1995 – *Avocado*.

UNECE Standard FFV- 42 *concerning the marketing and commercial quality control of Avocados*.

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

Ashworth, Vanessa ETM, Haofeng Chen, and Michael T. Clegg. 2011. "Persea." Pp. 173–89 in *Wild Crop Relatives: Genomic and Breeding Resources*. Springer.

Bergh, Bob, and Norm Ellstrand. 1986. "Taxonomy of the Avocado." *California Avocado Society Yearbook* 70:135–46.

Tashi, S., Yangchen, U., Dahal, Y., & Gurung, D. B. Case Studies of Successful Farmers, Agri-enterprises and Farmers' Groups and Cooperatives in Bhutan.

Tomiyasu, Y., Tshering, G., Chophel, S., Phuntsho, T., Tshering, K., Dorji, U., & Chofil, P. (2018, December). *Guidebook on Fruits Cultivation*. Integrated Horticulture Promotion Project (IHPP), JICA, ARDC-Bajo, Wangdue Phodrang, Department of Agriculture, Ministry of Agriculture and Forests.

Yangchen, T., Phuntsho, L., Pem, T., Lungki, Tashi, S., Penjor, T., & Dorji, L. (2022). *Morphological characterization of avocado at Agriculture Research and Development Sub-Centre, Lingmethang, Mongar, Bhutan* [Manuscript]. ARDC Wengkhari, Department of Agriculture, Ministry of Agriculture and Livestock.

FOOD AND AGRICULTURE TECHNICAL COMMITTEE (TC 02)

Organization

National Dairy Development Centre, MoAL, Thimphu

Bhutan Agro Industries Limited, Thimphu

Bhutan Exporters Association, Phuentsholing

Bhutan Food and Drug Authority, MoH, Thimphu

Bhutan Livestock Development Corporation Limited, Thimphu

Department of Agriculture, MoAL, Thimphu

Department of Agriculture, MoAL, Thimphu

Department of Agricultural Marketing and Cooperatives, MoAL, Thimphu

Department of Agricultural Marketing and Cooperatives, MoAL, Thimphu

Department of Industry, MoICE, Thimphu

National Post Harvest Centre, DAMC, MoAL, Paro

Competition and Consumers Affairs Authority, MoICE, Thimphu

Competition and Consumers Affairs Authority, MoICE, Thimphu

Bhutan Standards Bureau, Thimphu

Representative(s)

Mr. Phuntsho T Norbu (Chairperson)

Ms. Tashi Dema

Mr. Tshering Yeshe

Ms. Yeshe Lhamo

Mr. Birendra Dhakal

Mr. Namgay Thinley

Mr. Bal Bahadur Rai (Alternate)

Mr. Dawa Tshering

Mr. Jamyang Lophyal (Alternate)

Mr. Tashi Dorji

Ms. Sonam Lhamo

Mr. Jigme Dorji

Ms. Tshewang Choden (Alternate)

Mr. Karma Wangdi,
Offtg. Director General
(Ex-officio member)

Member Secretary

Cheki Zangmo

Standardization Division

Bhutan Standards Bureau

SUB COMMITTEE ON FRUITS AND VEGETABLES (TC02/SC15)

Organization

National Post Harvest Centre, DAMC, MoAL, Paro

Bhutan Food and Drug Authority, MoH, Gelephu

Bhutan Soul Farmers, Paro

National Centre for Organic Agriculture, DoA, MoAL,
Thimphu

Representative(s)

Mr. Sujan Pradhan (Chairperson)

Mr. Thinley Penjor

Mr. Lhundup Dukpa

Ms. Tshering Yangchen

Member Secretary

Cheki Zangmo

Standardization Division

Bhutan Standards Bureau