



THAI AGRICULTURAL STANDARD

TAS 2-2013

MANGOSTEEN

**National Bureau of Agricultural Commodity and Food Standards
Ministry of Agriculture and Cooperatives**

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National Bureau of Agricultural Commodity and Food Standards

Ministry of Agriculture and Cooperatives

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**Technical Committee on the Elaboration of Thai Agricultural Standard on
Good Agricultural Practices for Mangosteen**

- | | |
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Whereas, the Ministry of Agriculture and Cooperatives has issued the Thai Agricultural Standard entitled Mangosteen (TAS 2–2003) dated November 6th, B.E.2546 (2003) which was published in the General Announcement of the Royal Gazette dated December 19th, B.E. 2546 (2003). In order to improve the elements of such standard to the changing situation , the Agricultural Standards Committee deems it necessary to revise the existing standard in order to gain recognition on quality and safety domestically and internationally.

This standard is based on the following documents:

Department of Agricultural Extension. B.E. 2551. Production of Good Quality Mangosteen. Ministry of Agriculture and Cooperatives.

TAS 2–2003. Thai Agricultural Standard for Mangosteen. National Bureau of Agricultural Commodity and Food Standards, Bangkok.10p.

CODEX STAN 204-1997. Mangosteen. Joint FAO/WHO Food Standards Programme. FAO, Rome. 4p.

ASEAN Stan 10:2008. Standard for Mangosteen. Public Affairs Office, ASEAN Secretariat, Indonesia. 7p.



**NOTIFICATION OF THE MINISTRY OF AGRICULTURE AND COOPERATIVES
SUBJECT: THAI AGRICULTURAL STANDARD: MANGOSTEEN
UNDER THE AGRICULTURAL STANDARDS ACT B.E. 2551 (2008) AND
ITS AMENDMENTS**

Whereas the Agricultural Standards Committee, by the decision of the Fifth Session of B.E. 2556 (2013) on 20 September B.E. 2556 (2013), deems it necessary to establish an agricultural standard for mangosteen as a voluntary standard in accordance with the Agricultural Standards Act B.E. 2551 (2008) to promote such agricultural commodity to meet its standard on quality and safety.

By virtue of Section 5, Section 15 and Section 16 of the Agricultural Standards Act B.E. 2551 (2008), the Minister of Agriculture and Cooperatives hereby issues this Notification on the Establishment of Thai Agricultural Standard : Mangosteen as follows:

1. The Notification of the Ministry of Agriculture and Cooperatives on Thai Agricultural Standard : Mangosteen dated 6 November B.E. 2546 (2003) is repealed.
2. The Thai Agricultural Standard for Mangosteen (TAS 2-2013) is established as voluntary standard, details of which are attached herewith.

Notified on 16 October B.E. 2556 (2013)

(Mr. Yukol Limlamthong)
Minister of Agriculture and Cooperatives

THAI AGRICULTURAL STANDARD

MANGOSTEEN

1. SCOPE

- 1.1 This standard applies to commercial variety of mangosteen grown from *Garcinia mangostana* L. of the Guttiferae family, to be supplied fresh to the consumer.
- 1.2 This standard does not apply to mangosteen for further processing.

2. QUALITY

2.1 Minimum requirements

2.1.1 In all classes, subject to the special provisions for each class and the tolerances allowed, the mangosteen shall be as follows:

- (1) whole;
- (2) pedicel intact and with or without calyx;
- (3) sound;
- (4) free of bruised, indented or crack mark and deterioration or rotting rendering it unfit for consumption;
- (5) clean, practically free of any visible foreign matter;
- (6) practically free of pests affecting the general appearance of the produce;
- (7) practically free of damage caused by pests affecting the pulp quality;
- (8) free of abnormal external moisture, excluding condensation following removal from cold storage;
- (9) free of damage caused by low and/or high temperatures;
- (10) free of any foreign smell and/or taste;

2.1.2 Mature mangosteen shall be harvested from stage 2 of the harvesting index onwards when the fruit shows greenish with reddish purple patches to enable the fruit to further ripen and to arrive in satisfactory condition at the place of destination.

2.2 Classification

Mangosteen is classified into three classes as follows:

2.2.1 Extra Class

Mangosteen in this class shall be of superior quality with pedicel and complete calyx intact. Slight defects are allowed, provided that the skin defect areas do not exceed 10 % of total surface area. Translucent pulp and/or pulp with yellow latex stain are allowed provided that the amount does not exceed 5 % of total number or weight of fruit. The defects shall not affect the general appearance of the produce, the pulp quality, the keeping quality and presentation in the package.

2.2.2 Class I

Mangosteen in this class shall be of good quality, the following defects may be allowed:

- (1) slight defect in shape and colour;
- (2) slight skin defects due to scratch, shallow scars and damage caused by pest, provided that the skin defect areas do not exceed 30% of the total surface area;
- (3) translucent pulp and/or pulp with yellow latex stain are allowed provided that the amount does not exceed 10 % of total number or weight of fruit.

The defects in (1) or (2) shall not affect the general appearance, the pulp quality, the keeping quality and presentation in the package.

2.2.3 Class II

This class includes mangosteen which does not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1. The following defects may be allowed:

- (1) defects in shape and colour;
- (2) skin defects due to scratch, shallow scars and damage caused by pest provided that the skin defect areas do not exceed 50% of the total surface area;
- (3) translucent pulp and/or pulp with yellow latex stain are allowed provided that the amount does not exceed 20 % of total number or weight of fruit.

The defects in (1) or (2) shall not affect the general appearance, the pulp quality, the keeping quality and presentation in the package.

3. SIZING

Size is determined by weight per fruit as shown in Table 1:

Table 1 Sizes of Mangosteen

Size code	Weight per fruit (g)
1	> 100
2	> 85 to 100
3	> 70 to 85
4	> 55 to 70
5	> 30 to 55

Note: The classification of quality and size code according to this standard may be combined to stipulate trade classification. Trade partners may name the trade classification differently depending on their requirements or seasonal limitations.

4. TOLERANCES

The following tolerances in respect of quality and size shall be allowed in each package for mangosteen not satisfying the requirements of the class indicated:

4.1 Quality tolerances

4.1.1 Extra Class

Five percent by number or weight of produce not satisfying the requirements of the Extra Class (Section 2.2.1), but meeting those of Class I (Section 2.2.2) or, exceptionally, coming within the tolerances of Class I (Section 4.1.2)

4.1.2 Class I

Ten percent by number or weight of produce not satisfying the requirements of Class I (Section 2.2.2), but meeting those of Class II (Section 2.2.3) or, exceptionally, coming within the tolerances of Class II (Section 4.1.3)

4.1.3 Class II

Ten percent by number or weight of produce satisfying neither the requirements of Class II (Section 2.2.3) nor the minimum requirements (Section 2.1), with the exception of produce affected by bruised mark, rotting or other deterioration rendering it unfit for consumption.

4.2 Size tolerances

For all size codes, ten percent by number or weight of produce corresponding to the size code immediately above or below as indicated in Table 1.

5. PACKAGING

5.1 Package

The package shall be of good quality, hygienic and free of any foreign material and smell as well as to protect damage affecting fruit quality. The materials used inside the package shall be clean and of good quality. The use of materials, particularly paper or stamps bearing trade specifications is allowed, provided that the printing or labelling has been done with non-toxic ink or glue.

5.2 Uniformity

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

6. MARKING AND LABELLING

6.1 Consumer packages.

The detailed information shall appear on the package, wrapping material, fastening material, tag or on the fruit in a manner that is legible, clear, and indelible without false or deception as follows:

(1) Name of the produce

To be specified as “mangosteen”;

(2) Net weight;

(3) Class;

(4) Size code and/or weight;

(5) Information of producer and/or importer and/or distributor;

Indicate the name and address of producer or re-packer or distributor. Alternatively, name and address of head office of producer or re-packer may be given. If the produce is imported, importer’s name and address shall be indicated.

(6) Origin of produce;

Indicate country of origin, except is for domestic market.

(7) Date of production and/or packing

(8) Language

Label of produce for domestic market shall be in Thai, however, foreign language may also be added. Label of produce for export can be in foreign language.

6.2 Non-retail containers

The detailed information shall be shown on the accompanied documents of the shipment, on the label, or on the non-retail container in a manner that is legible, indelible without false or deception as follows:

- (1) Name of the produce;
To be specified as “mangosteen”;
- (2) Net weight;
- (3) Class;
- (4) Size code and/or weight;
- (5) Information of producer and/or distributor;

Indicate the name and address of producer or re-packer or distributor. Alternatively, name and address of head office of producer or re-packer may be given. If the produce is imported, importer’s name and address shall be indicated.

- (6) Origin of produce;

Indicate country of origin, except for domestic market.

- (7) Date of production and/or packing
- (8) Language

Label of produce for domestic market shall be in Thai, however, foreign language may also be added. Label of produce for export can be in foreign language.

6.3 Certification mark

The use of certification mark under the Agricultural Standards Act B.E.2551 (2008) and its amendments shall be complied with the Ministerial Regulation of B.E.2553 (2010) on Provisions Concerning Characteristics of Mark, Application and Display, and the related Notifications of National Bureau of Agricultural Commodity and Food Standards.

7. CONTAMINANTS

Maximum levels of contaminants in mangosteen shall be in compliance with the related laws and regulations^{1/}.

^{1/} Ministerial Notification of Ministry of Public Health entitled Standards of Contaminants in Foods

8. PESTICIDE RESIDUES

Maximum residue limits of pesticides in mangosteen shall be in compliance with the related laws and regulations^{2/}and the requirements under the Thai Agricultural Standards on Pesticide Residues: Maximum Residue Limits (TAS 9002) and Pesticide Residues: Extraneous Maximum Residue Limits (TAS 9003)

9. HYGIENE

Mangosteen shall be produced under hygienic practices in accordance with related standard on Good Agricultural Practices (GAP) and/or Thai Agricultural Standard on Good Manufacturing Practices for Packing House of Fresh Fruits and Vegetables (TAS 9035) or other equivalent standards.

10. METHODS OF ANALYSIS AND SAMPLING

10.1 Analytical method

Analytical methods are shown in Table 2:

Table 2 Analytical methods

Criteria	Analytical methods	Principles
1. Quality : minimum requirements (Section 2.1.1)	Visual inspection	-
2. Defects in shape and colour (Section 2.2)	Visual inspection	-
3. Skin defects (Section 2.2)	Visual inspection	-
4. Size (Section 3)	Weighing	Gravimetry

10.2 Sampling method

Sampling method shall be in accordance with the related laws, and provisions of the Agricultural Standard related to method of sampling.

^{2/} Ministerial Notification of Ministry of Public Health on Pesticide Residues in Foods

APPENDIX A
PHOTOS OF MANGOSTEEN

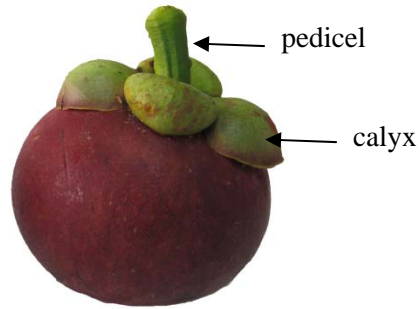


Figure A.1 Whole fruit (Section 2.1.1(1))



Figure A.2(a) Pedicel intact and broken calyx (Section 2.1.1(2))

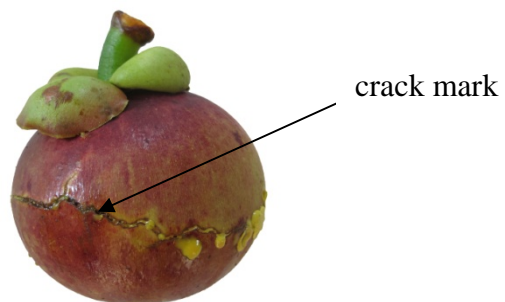


Figure A.2(b) Significant crack mark (Section 2.1.1(4))

Figure A.2 Fruits that do not meet minimum requirements (Section 2.1.1)



Figure A.2 (c) Indented mark and quality deterioration (Section 2.1.1 (4))



Figure A.2 (d) Damage caused by pests (Section 2.1.1(7))

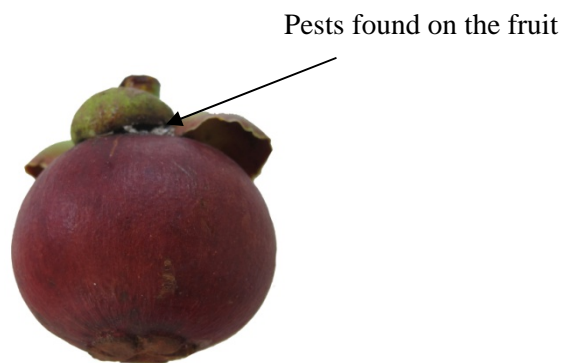


Figure A.2 (e) Pest infestation(Section 2.1.1(6))

Figure A.2 (cont.) Fruits that do not meet minimum requirements (Section 2.1.1)



Figure A.3(a) Translucent pulp (Section 2.2)









Figure A.3 (b) Pulp with yellow latex stain (Section 2.2)

Figure A.3 Pulp defects (Section 2.2)

APPENDIX B

TABLE FOR HARVESTING INDEX OF MANGOSTEEN

(Section 2.1.2)

Mangosteen	Development Stage	Fruit Characteristics
	Stage 1	<ul style="list-style-type: none"> - green - a lot of latex in the rind - no separation between pulp and rind
	Stage 2	<ul style="list-style-type: none"> - light green, and reddish purple patches begin to develop - pulp and rind are hard to moderate for separation
	Stage 3	<ul style="list-style-type: none"> - pink covers the whole fruit - lesser latex in the rind - pulp and rind are moderately separated
	Stage 4	<ul style="list-style-type: none"> - purplish red - lesser latex in the rind
	Stage 5	<ul style="list-style-type: none"> - reddish purple - no latex in the rind - pulp and rind are separated and not resistant to pressing - beginning of appropriate stage to consume
	Stage 6	<ul style="list-style-type: none"> - dark purple - no latex in the rind - pulp and rind are separated and not resistant to pressing