



THAI AGRICULTURAL STANDARD

TAS 8801-2012

PANGOLA HAY

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

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50 Phaholyothin Road, Ladyao, Chatuchak, Bangkok 10900

Telephone (662) 561 2277 www.acfs.go.th

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**Technical Committee on the Elaboration of Thai Agricultural Standard for
Pangola Grass**

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Pangola grass is one of the forage crops containing high protein and low fiber suitable as roughage feed for animal. Pangola grass is seasonally available in fresh form during the raining season. In order to provide sufficient amount of Pangola hay to meet the farmers demand for feed in dry season, the commercial Pangola hay is then produced. The Agricultural Standards Committee, therefore deems it necessary to establish the standard for Pangola hay to be a guideline for the production and quality control as well as to encourage good, hygienic and effective practices of Pangola hay for the health of animal in order to produce safe animal products for human consumption.

This standard is based on the following documents:

National Bureau of Agricultural Commodity and Food Standards. B.E. 2553 (2010). Report on the Study of Quality Criteria for Pangola Hay Production as Animal Feed under the Collaborative Project between the National Bureau of Agricultural Commodity and Food Standards and the Bureau of Animal Nutrition Development, Department of Livestock Development.

Ministry of Agriculture and Cooperatives. B.E. 2554 (2011). Thai Agricultural Standard, Fresh Pangola Grass (TAS. 8800-2011). National Bureau of Agricultural Commodity and Food Standards.

Ministry of Agriculture and Cooperatives. B.E. 2554 (2011). Thai Agricultural Standard, Good Agricultural Practices for Pangola Grass (TAS. 8900-2011). National Bureau of Agricultural Commodity and Food Standards.



NOTIFICATION OF THE MINISTRY OF AGRICULTURE AND COOPERATIVES
SUBJECT: THAI AGRICULTURAL STANDARD:
PANGOLA HAY
UNDER THE AGRICULTURAL STANDARDS ACT B.E. 2551 (2008)

Whereas the Agricultural Standards Committee, by the decision of the fifth Session of B.E. 2555 (2012) on 24 September B.E. 2555 (2012), deems it necessary to establish an agricultural standard for Pangola Hay 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 Establishment of Thai Agricultural Standard: Pangola Hay (TAS 8801-2012) as a voluntary standard, details of which are attached herewith.

Notified on 2 October B.E. 2555 (2012)

(Mr. Theera Wongsamut)
Minister of Agriculture and Cooperatives

THAI AGRICULTURAL STANDARD

PANGOLA HAY

1. SCOPE

1.1 This standard applies to Pangola grass grown from *Digitaria eriantha* Steud. of the family Gramineae, which is commercially produced as hay for animal feed.

1.2 This standard does not apply to fresh Pangola grass.

2. DEFINITIONS

The definitions used in this standard are referred to Thai Agricultural Standard: Fresh Pangola grass (TAS 8800), the Good Agricultural Practices for Pangola Grass (TAS 8900) and the followings:

2.1 Foreign matter means articles other than Pangola hay such as weed, leaves, metal, oakum, plastic, soil and glass.

2.2 Acid detergent fibre (ADF) means fibre derived from plant's cell wall which is insoluble in acidic solution. This fibre contains cellulose, lignin, cutin and may contain certain minerals.

2.3 Lot means Pangola hay grown from the fields of the same area and management with the same age of cutting including drying, compressing and storing.

2.4 Weed means any plant which should not be found in Pangola grass field.

3. QUALITY

3.1 Minimum Requirements

Pangola hay, in all classes, subject to the special provisions for each class and the tolerances allowed, shall be as follows:

- (1) Typical characteristics of the variety;
- (2) Uniform of dryness throughout the bale;
- (3) Soft, hay scented, natural hay colour and free from abnormal odour and colour;
- (4) Without visible mould.

3.2 Classification

Moisture content for Pangola hay in all classes shall not exceed 15%. Pangola hay shall be classified into 4 classes (A, B, C, D) according to the percentage of protein on a dry matter basis. Each class is divided into 3 subclasses regarding the percentage of ADF on a dry matter basis as shown in Table 1.

Table 1 Quality class of Pangola hay

% Crude Protein ^{1/}	% ADF ^{1/}		
	< 35.0	35.0-40.0	>40.0
>13.0	A ^{2/} 1	A ^{2/} 2	A ^{2/} 3
10.0-13.0	B 1	B 2	B 3
7.0-9.9	C 1	C 2	C 3
<7.0	D 1	D 2	D 3

3.3 Foreign matter

3.3.1 All classes shall be no appearance of pieces of metal, glass and plastic.

3.3.2 Class A, foreign matter including weed^{3/} may be allowed not to exceed 5% of dry matter basis. In class B, C and D shall not exceed 10% of dry matter basis.

3.4 Product characteristic

Pangola hay is highly compressed into a bale with regular size and weight. Use of wire to fasten the bale is not allowed. Baled hay shall not lose during handling.

^{1/} Good quality of Pangola hay should contain high protein (Protein means crude protein from the analysis of nitrogen multiply by factor of 6.25) which is adequate for the animal protein requirement and contain low ADF because ADF has inverse relation with dry matter digestibility.

^{2/} Class A, the length of Pangola grass shall not exceed 50 cm and age cutting not more than 45 days. Pangola grass shall have high leafiness and come from field with good management and fertilization according to soil condition and plant nutrient requirement.

^{3/} Includes noxious weeds such as flower-head weed, garden spurge, crowfoot grass, bullhead, pig weed, clover fern, crofton weed. Particularly, horse and rabbit are susceptible to the above mentioned weeds.

4. MARKING AND LABELLING

4.1 Label and accompanying documents

The information appears on label or accompanying documents shall be legible, clear without false or deception, at least as follows:

- (1) Name of the produce

To be specified as “Pangola hay”;

- (2) Class;

- (3) Lot number;

- (4) Net weight: kilogram (kg) or metric ton (MT) per bale;

- (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/ month/year of cutting;

- (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.

4.2 Certification mark

The use of certification mark 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.

5. PESTICIDE RESIDUES

Maximum residue limits of pesticides in Pangola hay shall be in compliance with the related laws and regulations-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).

6. HYGIENE

Pangola hay shall be produced under hygienic practices in accordance Thai Agricultural Standard on Good Agricultural Practices for Pangola Grass (TAS 8900) to obtain suitable quality and prevention of physical, chemical and biological contamination that are harmful to animals.

7. METHODS OF ANALYSIS AND SAMPLING

7.1 Methods of Analysis

The quality examination shall follow the methods as in Table 2.

Table 2 Methods of analysis
(Section 7.1)

Items	Analytical Methods	Principles
1. General provision	Visual inspection	Sensory
2. Foreign matter	Measurement e.g. ruler, tape measure	Gravimetry
3. Moisture	Association of Official Analytical Chemists (AOAC) 930.15 or equivalent methods.	Gravimetry
4. Crude protein	Association of Official Analytical Chemists (AOAC) 984.13 or equivalent methods.	Titrimetry (Kjeldahl)
5. ADF	Association of Official Analytical Chemists (AOAC) 973.18 or equivalent methods.	Gravimetry

7.2 Sampling methods

Sampling methods are described as in Appendix A.

APPENDIX A

SAMPLING METHODS

(Section 7.2)

A1. Instrument

A.1.1 Push type probe

A.1.2 Drill type probe

A.1.3 Probe diameter shall be 0.95 cm (3/8 inch) to 1.9 cm (3/4 inch).

A.2 Method

A.2.1 For rectangular bale, sample shall be collected by inserting the sharp probe at the middle of the blunt end of bale parallel to the ground about 30 cm (12 inches) to 46 (18 inches) in depth.

A.2.2 For round bale, sample shall be collected by inserting the sharp probe from centre of curved side of bale parallel to the ground about 30 cm (12 inches) to 46 (18 inches) in depth.

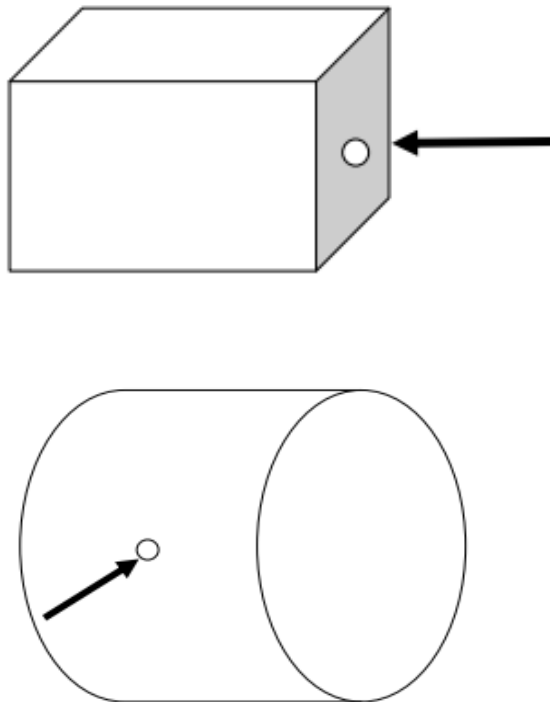


Figure A.1 Position of drilling rectangular and round bales

A.2.3 If the lot represented Pangola hay not more than 20 bales, samples for laboratory analysis shall be taken from every bale and pooled as one sample. If the lot represented Pangola hay more than 20 bales, at least 20 bales shall be sampled and pooled as one sample. Each sample shall not be less than 500 g pack in a plastic bag and tightly close. The bag shall be identified with lot number and date of sampling.

A.2.4 Random sampling shall be performed both vertical and horizontal of the bulk. Mark sampled bale to prevent repeatedly sampling.

A.2.5 Inspection or certification body shall keep such sample at least 1 year.

APPENDIX B

PHOTOS OF PANGOLA HAY



Figure B1 Rectangular bale



Figure B.2 Pangola hay transportation