**Hay as animal feed — Specification**

**Part 1: Grass Hay**

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**TECHNICAL COMMITTEE REPRESENTATION**

The following organizations were represented on the Technical Committee:

Ministry of Agriculture and Irrigation — State Department of Livestock

Kenyatta University—Department of animal science

Kenya Agriculture and Livestock Research Organization (KALRO)

Unga Farm Care EA Ltd.

Modern Ways Ltd.

Directorate of Veterinary Services

Association of Kenya Feed Manufacturers (AKEFEMA)

Government Chemist Department

Pioneer Feeds Ltd.

Embu University College

University Of Nairobi

Accelerated Agriculture and Livestock Enterprises

Global Space Africa Agribusiness (GLOSAA)

Pembe Flour Mills Ltd.

Joeliz Bone meal Ltd.

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Kenya Bureau of Standards — Secretariat

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**Part 1: Grass Hay**

**KENYA BUREAU OF STANDARDS (KEBS)**

**Head Office:** P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031

E-Mail: info@kebs.org, Web:http://www.kebs.org

**Coast Region Lake Region Rift Valley Region**

P.O. Box 99376, Mombasa-80100 P.O. Box 2949, Kisumu-40100 P.O. Box 2138, Nakuru-20100

Tel.: (+254 041) 229563, 230939/40 Tel.: (+254 057) 23549, 22396 Tel.: (+254 051) 210553, 210555

Fax: (+254 041) 229448 Fax: (+254 057) 21814

**Foreword**

This Kenya Standard was prepared by the Animal Feeds Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Though over 70 percent of feed for domestic animals comes from forage materials, institutional and regulatory framework governing their production, processing and marketing including private sector support is underdeveloped. Market analysis allude to the existence of significant market opportunities for fodder farmers provided they increase productivity, reduce cost of production, improve quality and safety, and enhance efficiency in marketing. In order to achieve quantity and quality pasture and fodder, promote fair trade and allow customer choice of type of hay, development of standards need to be prioritized. The proposed Standard seeks to guard against hay adulteration, enhance traceability, under commercial hay production and marketing. The hay standard provides guidelines for minimum nutritional, weight and safety requirements of commercial hay in order to facilitate trade.

It is anticipated that this standard will assist both hay producers and animal feeds millers to maintain good quality and exercise proper quality control during, storage, processing and manufacturing.

In the preparation of this standard, reference was made to:

* Fertilizers and Animal Feedstuffs Act, Cap 345.
* Directive **2002/32/EC** on undesirable substances on animal feed.
* [Heuzé V.](https://www.feedipedia.org/user/3), [Tran G.](https://www.feedipedia.org/user/4), [Baumont R.](https://www.feedipedia.org/user/7), [Lebas F.](https://www.feedipedia.org/user/14), 2016. Buffel grass (Cenchrus ciliaris). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO.
* [Heuzé V.](https://www.feedipedia.org/user/3), [Tran G.](https://www.feedipedia.org/user/4), [Delagarde R.](https://www.feedipedia.org/user/26), [Lebas F.](https://www.feedipedia.org/user/14), 2015. Bermuda grass (Cynodon dactylon). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO.
* [Heuzé V.](https://www.feedipedia.org/user/3), [Tran G.](https://www.feedipedia.org/user/4), [Sauvant D.](https://www.feedipedia.org/user/5), 2015. Red oat grass (Themeda triandra). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO.
* [Heuzé V.](https://www.feedipedia.org/user/3), [Tran G.](https://www.feedipedia.org/user/4), 2015. Guinea grass (Megathyrsus maximus). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO.
* [Heuzé V.](https://www.feedipedia.org/user/3), [Tran G.](https://www.feedipedia.org/user/4), [Hassoun P.](https://www.feedipedia.org/user/11), [Lebas F.](https://www.feedipedia.org/user/14), 2015. Jaragua (Hyparrhenia rufa). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO.
* Typical nutrient composition of some common grasses and legumes in Kenya. <https://www.livestockkenya.com/index.php/blog/feeds-and-feeding/134-typical-nutrient-composition-of-some-common-grasses-and-legumes-in-kenya>
* FAO, (2006) Kenyan pastures (Orodha, A.B). *Country Pasture/Forage Resource Profiles*

Acknowledgement is hereby made for the assistance derived from these sources.

**Hay as animal feed — Specification**

**Part 1: Grass Hay**

**1 Scope**

This Kenya Standard specifies the requirements and test methods for grass hay used as animal feed.

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**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.

KS 63, *Methods of test for animal feedstuffs*

KS 2543, *The animal feed industry — Code of practice*

**3 Definitions**

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

**3.1 Hay**

Hay is [grass](https://en.wikipedia.org/wiki/Grass), [legumes](https://en.wikipedia.org/wiki/Legumes), or other [herbaceous plants](https://en.wikipedia.org/wiki/Herbaceous_plant) that have been cut, dried, for use as animal [feed](https://en.wikipedia.org/wiki/Fodder), particularly for ruminants such as [cattle](https://en.wikipedia.org/wiki/Cattle), [horses](https://en.wikipedia.org/wiki/Horse), [goats](https://en.wikipedia.org/wiki/Domestic_goat), and [sheep](https://en.wikipedia.org/wiki/Sheep).

**3.2 Rhodes Grass**

Is a grass of the species Chloris gayana widespread in the tropical and subtropical countries. It is drought resistant and has been improved in terms of biomass production and nutritional quality.

**3.3 Natural pastures**

Natural pasture is grass that has not been cultivated. Natural pastures are adapted to specific local growing conditions and can be found in most agro-ecological zones but are more predominant in grasslands of the tropics and subtropics.

**4 Requirements**

**4.1 General requirements**

Grass hay;

1. Shall be presented in form of bales weighing minimum of 14 kgs.
2. Shall be free from harmful constituents, weeds, stones and soil, metallic objects, adulterants,
3. Shall be free from moulds, pathogenic bacteria or insect infestation
4. Shall be free from musty, rancidity or uncharacteristic odour.
5. Shall be free from rain damage
6. Shall be free from poisonous plants and seeds
7. Shall be free from plant pests and diseases
8. Shall be free from pesticide and herbicide residues
9. Shall be free from animal pests and disease causing agents

**4.2 Specific requirements**

Grass hay shall comply with the nutritional requirements prescribed in Table 1.

**Table 1 — Nutritional requirements for Rhodes grass and Natural pasture grass**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SL No** | **Parameters (%DM)** | **Rhodes grass** | **Natural Pasture grass** | **Test method** |
| i | Moisture content (%) (Max.) | 18.0 | 18.0 | KS -63 |
|  |  |  |  |
| ii | Metabolisable Energy (Mj/kg) (Min) | 8.0 | 7.5 |
| iii | Crude protein ( Min) | 8.0 | 7.0 |
| iv) | Crude Fibre (max.) | 35.0 | 40.0 |
|  | Neutral Detergent Fibre (NDF),(max.) | 70.0 | 75.0 |
|  | Acid Detergent Fibre (ADF)(max.) | 40.0 | 45.0 |
|  | Acid Detergent Lignin (ADL) (max.) | 7.5 | 10.0 |
| v) | Total ash (max.) | 10.0 | 12.0 |
| vii) | Calcium (max.) | 0.2 | 0.2 |
| viii) | Phosphorous (min.) | 0.1 | 0.1 |

**5.0 Heavy metals and pesticide residues**

**5.1 Heavy metals Contaminants**

Hay shall comply with the maximum limits of heavy metals as specified in the table 2

**Table 2: Limits of heavy metals**

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Heavy metal Limits** | **Maximum limit (mg/kg)** | **Test method** |
| i | Arsenic | 4.0 | ISO 27085 |
| ii | Lead | 30 |
| iii | Cadmium | 1.0 |
| iv | Mercury | 0.1 |

**5.2 Pesticide residues**

Shall not exceed the limits established by the Codex Alimentarius CODEX STAN 193-1995 on Contaminants

**6 Aflatoxins**

Total aflatoxin level shall not exceed 100 ppb while aflatoxin B1 shall not exceed 5ppb.

**7 Packaging and labeling**

**7.1 Packaging**

**7.1.1** Hay for sale shall be baled using sufficiently strong twines so as to withstand reasonable handling without tearing, bursting or falling open during normal handling and transportation.

**7.1.2 Hay** should be transported in clean vehicles and the hay should be covered.

**8.2 Labeling**

The following particulars shall be legibly and indelibly displayed on the label.

1. Type of hay (Rhodes, Natural pasture Grass).
2. Name and the physical address of the producer.
3. Net weight.
4. Batch number
5. Date of harvest/production.
6. Expiry date
7. Instruction for storage
8. Nutritional information.( Moisture ,Energy(ME), Crude protein(CP) and Crude fibre(CF)