AFRICAN STANDARD

Prosopis meal for compounded animal feeds — Specification



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Introduction

Prosopis juliflora has been used by communities for animal feeding over the years without established quality and safety measures. Furthermore, the fast spread of the plant has been seen as a rising concern. Therefore, sustainable management and utilization of the plant as a raw material in feed manufacturing is needed.

Competition for limited cereals between man and livestock has been a challenge, a scenario that makes it critical to find alternative sources of non-cereal raw materials. Prosopis potentially offers outstanding opportunities in this regard. Concerted efforts are therefore required to fill the knowledge gaps in order to make Prosopis a popular choice as a sustainable resource and to take full advantage of its fast spread and wide distribution.

The standard will assist processors and feed manufacturers to exercise proper quality control during production and ensure safety of the final product.

Prosopis meal for compounded animal feeds — Specification

1 Scope

This Draft African standard specifies the requirements, sampling and test methods for *Prosopis* meal used in compounded animal feed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

FDARSO 2139, Code of good practice on animal feeding

FDARS 1828, Animal feeds — Code of practice for production, processing, storage, transport, and distribution

ISO 2591-1, Test sieving — Part 1: Methods using test sieves of woven wire cloth and perforated metal

ISO 5984:2002, Animal feeding stuffs — Determination of crude ash

ISO 5985, Animal feeding stuffs - Determination of ash insoluble in hydrochloric acid

ISO 6492, Animal feeding stuffs - Determination of fat content

ISO 6496, Animal feeding stuffs - Determination of moisture and other volatile matter content

ISO 6497 Animal feeding stuffs — Sampling

ISO 6865, Animal feeding stuffs — Determination of crude fibre content — Method with intermediate ISO 6869, Animal feeding stuffs — Determination of the contents of calcium, copper, iron, magnesium,

manganese, potassium, sodium and zinc — Method using atomic absorption spectrometry

ISO 14718, Animal feeding stuffs — Determination of aflatoxin B₁ content of mixed feeding stuffs — Method using high-performance liquid chromatography

ISO 16634-1, Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content — Part 1: Oilseeds and animal feeding stuffs

ISO 17375, Animal feeding stuffs — Determination of aflatoxin B₁

ISO 16050, Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High-performance liquid chromatographic method

3 Terms and definitions

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

3.1 prosopis juliflora

evergreen leguminous tree growing up to 15 meters high, often multi-stemmed, thorny and highly tolerant to drought, heat, salinity, adverse growing conditions and adapts to almost all types of soil and widely varying climatic conditions

3.2

prosopis meal

milled whole pods or seeds

3.3

prosopis whole pod

ripe fruit of the Prosopis juliflora plant

3.4

prosopis seed bean contained in the pod

3.7

crude protein

СР

total protein content of prosopis meal which is determined by analysing the nitrogen content of feed and multiplying the result by a factor

3.8

crude fibre

CF

residue obtained after acid and alkaline digestion of a feed sample that contains cellulose, hemicellulose, lignin and pectin

3.9

crude fat

total fat content of a feed determined by a laboratory test

3.10

metabolizable energy

ME

amount of the useful energy in a feed that represents that portion of the feed gross energy not lost in feaces, urine and eructated gas

3.11

total digestible nutrients

TDN

sum of the digestible fibre, protein, lipid and carbohydrate content of feed, which expresses the energy value of feed as calculated using formulae and not reported as measured values

Note TDN is directly related to digestible energy and is often calculated based on acid detergent fibre

3.12

total ash

crude ash

inorganic part of a feed consisting of mineral elements determined in a laboratory by incineration at a high temperature and weighing the residue

3.13

moisture content

moisture and other volatile matter content

mass fraction of substances lost on drying the sample by using the accredited procedure

Note to entry: The moisture and other volatile matter content is expressed as a mass fraction in percent [formerly given as % (m/m)].

3.14

undesirable substances

contaminants and other substances, which are present in feed and feed ingredients and which constitute a risk to the health of consumer, including food safety related animal health issues

3.15 (use definitions from sheep and goat) Acid insoluble ash

<mark>3.16</mark> NDF

3.17 acid detergent fibre ADF

amount of residue (primarily cellulose, lignin and variable amounts of silica) remaining after boiling a *feed* sample in an acid detergent solution

4 Requirements

4.1 General requirements

4.1.1 Appearance

4.1.1.1 The whole pod meal shall be gold yellow in colour. The seed meal shall be brown to light chocolate in colour.

Prosopis meal shall be free from harmful constituents such as:

- a) metallic and glass objects;
- b) adulterants;
- c) physical moulds;
- d) pathogens or insect infestation;
- e) mustiness;
- f) rancidity; and
- g) any objectionable odours.

4.1.1.2 Prosopis meal shall be of good quality and not deteriorated.

4.2 Specific requirements

Prosopis meal shall also conform to the requirements stated in Table 1 when tested with the methods specified therein.

Table 1 — Requirements for *Prosopis* meal (whole pod and seed) for compounded animal feeds

S/N	Parameter	whole pod	seed	Test method
i.	Moisture, % Max.	12	13	ISO 6496
ij.	Crude protein % DM, Min.	11	30	ISO 16634-1
iii.	Crude fat % DM, Max.	4	8	ISO 11058
iv.	Crude fibre % DM, Max.	35	6	ISO 6865
٧.	Total ash % DM, Max.	6	6	ISO 5984
vi.	Neutral detergent fibre % DM, Max.	48	51	ISO 16472
vii.	Acid detergent fibre % DM, Max.	33	29.8	ISO 13906
viii.	Total digestible nutrients % DM, Min.	79.	92.5	Annex A
ix.	Acid Insoluble Ash % DM, Max	6.	4.	ISO 5985
Х.	Metabolizable energy kcal/kg DM, Min.	2866	3343	Annex B

xi.	Tannins (% Max.)	2	2	ISO 9648
xii.	Saponins (% Max.)	2	6	Accredited method*
*Any method could be applied by an accredited laboratory				

5 Contaminants

5.2 Aflatoxins

Prosopis whole pod meal and seed meal shall comply with the maximum limits for aflatoxin specified in Table 2, when tested with the methods specified therein.

Table 2 — Aflatoxin limits for Prosopis meal (whole pod and seed) for compounded animal feeds

S/N	Aflatoxin	Maximum limits μg/kg	Test method
i.	Total aflatoxin	20	ISO 16050
ii.	Aflatoxin B1	10	ISO 17375

5.3 Heavy metals

Prosopis whole pod meal and seed meal shall comply with the maximum limits of heavy metals as specified in Table 3 when tested with the methods specified therein.

Table 3 — Heavy metal limits for Prosopis meal (whole pod and seed) for compounded animal feeds

S/N	Heavy metals	Maximum limits mg/kg	Test method
i	Arsenic	4.0	
ii	Lead	3.0	
iii	Cadmium	1.0	ISO 18664
iv	Mercury	0.1	

5.4 Pesticide residues

Prosopis whole pod meal and seed meal shall not exceed the limits of pesticide residues established in the Codex Alimentarius Commission on Contaminants.

6 Hygiene, storage and transportation

Prosopis meal for compounded animal feed shall be processed and handled in accordance with the requirements of FDARS 2139..

Prosopis meal for compounded animal feed shall be produced, transported, received and stored in accordance with the procedure described in the appropriate sections of FDARS 1828.

7 Packaging and labelling

9.1 Packaging

9.1.1 Prosopis meal shall be packed in air tight containers of sufficient strength and adequately sealed so as to withstand reasonable handling without tearing, bursting or falling open during normal handling and transportation.

9.1.2 The containers shall be clean and free from visible indications of contamination, and insect infestation.

9.2 Labelling

Each package of prosopis whole pod meal / seed meal shall be legibly and indelibly marked with the following information:

- a) name of the product;
- b) name, physical address or contact information of manufacturer/producer/ importer/exporter/packer;
- c) country of origin;
- d) nutritional composition;
- e) net weight in SI units;
- f) batch or code number;
- g) date of manufacture;
- h) best before date; and
- i) instruction for handling, storage and use.

10 Sampling

Sampling shall be done in accordance with the requirements of ISO 6497.

Annex A

(normative)

Method for calculating Total Digestible Nutrients (TDN)

GE kcal = (4.2 * carbohydrate %) + (5.2 * CP %) + (9*fat %) (NRC, 2001)

DE (kcal) = GE (kcal) * 0.76

TDN = DE (kcal) /4.409 (NRC, 2001)

Where:

GE - gross energy DE - Digestible energy TDN – Total digestible nutrients

Annex B (normative)

Method for calculating Metabolizable Energy (ME)

GE kcal = (4.2 * carbohydrate %) + (5.2 * CP %) + (9*fat %) (NRC, 2001)

DE (kcal) = GE (kcal) * 0.76

ME (kcal) = DE (kcal) * 0.82 (NASEM, 2016)

Where:

GE – gross energy DE – Digestible energy

ME - Metabolizable energy

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