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Compounded horse feed — Specification

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Foreword

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This African Standard was prepared by ARSO/TC 17, *Animal feeding, feeds and feeding stuffs*.

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Compounded horse feed — Specification

1 Scope

This Committee Draft African Standard specifies the requirements, sampling and test methods for compounded horse feed.

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.

FDARS 2139, *Code of good practice on animal feeding*

FDARS 1828, *Code of practice for production, processing, storage, transport and distribution of animal feeds*

ISO 5983-1, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 1: Kjeldahl method*

ISO 5984, *Animal feeding stuffs — Determination of crude ash*

ISO 6490-1, *Animal feeding stuffs — Determination of calcium content — Part 1: Titrimetric method*

ISO 6491, *Animal feeding stuffs — Determination of phosphorus content — Spectrometric method*

ISO 6495, *Animal feeding stuffs — Determination of water-soluble chlorides content*

ISO 6497, *Animal feeding stuffs — Sampling*

ISO 6866, *Animal feeding stuffs — Determination of free and total gossypol*

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*

ISO/TS 17764-2, *Animal feeding stuffs — Determination of the content of fatty acids — Part 2: Gas chromatographic method*

3 Terms and definitions

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

3.1
compounded feed
mixture of at least two feed ingredients, whether or not containing feed additives, for oral animal feeding in the form of a complementary feed or a complete feed

3.2
feed ingredients
component part or constituent of any combination of mixture making up cattle feed, whether or not it has a nutritional value in the cattle's diet, including feed additives

3.3
crude protein
CP
total protein content of hay which is determined by analysing the nitrogen content of feed and multiplying the result by a factor

3.4
crude fibre
CF
residue obtained after acid and alkaline digestion of hay sample that contains cellulose, hemicellulose, lignin and pectin

3.6
crude fat
total fat content of a dried insect product determined by a laboratory test

3.7
digestible energy
DE
apparent energy of a *feed* that is available to the animal by digestion

4 Requirements

4.1 General requirements

4.1.1 Compounded horse feed shall be either dry or wet, raw or pre-cooked meal, crumbs or pellets

4.1.2 Compounded horse feeds shall be free from:

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

4.2 Ingredients for horse feed

4.2.1 All ingredients and raw materials shall not be deteriorated and shall comply with relevant African standards. Annex A provides further information on the common feedstuffs that may be used in compounding horse feed

4.2.2 Vitamin preparations added to feed shall be in stabilized form.

4.3 Nutrient composition of horse feed

4.3.1 The level of free fatty acids in feeds shall not exceed 15 % of the crude fat content at the time of manufacture, when tested with the requirements of ISO/TS 17764-2.

4.3.2 4.3.3 Decorticated, delinted and solvent extracted cotton seed cake may be used in compounded horse feed and the feed shall not contain more than 0.02 % gossypol, when tested in accordance with the requirements of ISO 6866.

4.4 Specific requirements

Horse feed shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific requirements for compounded horse feed

Nutrient	Limits	Test method
Crude protein, min %	9	ISO 5983-1
Crude fibre, min %	15	ISO 5498
Crude fat, %	2- 6	ISO 11058
Total ash, max %	7 – 9,1	ISO 5984
Digestible energy, min, Kcal/kg,	3 000	ISO 9831
Calcium, min %	0,7	ISO 6490-1
Phosphorus, min%	0,5	ISO 6491
Sodium chloride, max %	0,5	ISO 6495

Annex B provides further information on the micro nutrients required in compounded horse feeds

5 Feed additives

5.1 Additives in the following categories may be used in compounded horse feed:

a) antioxidants;
b) colourants;
c) emulsifiers;
d) stabilisers;
e) thickeners and gelling agents;
f) binders;
g) anti-caking agents and coagulants;
h) aromatic and appetising substances;
i) enzymes; and
j) preservatives.

NOTE Material intended for mixing with animal feed as additives for use as feeding stuff should specify the kind of and, if appropriate the age group of the animal for which the feed is intended. In addition the quantity in grams per kilogram (or percentage by weight) of the complete feed which conforms to the provisions of this standard should be stated in the label

5.2 No antibiotic substance, drug or mineral may be added to or included in a feed or concentrate other than such ingredients required to satisfy this standard.

5.3 Where a consignment or a batch of feed or concentrate is prepared specifically for a consumer or group of consumers, substances may be added upon the express written instructions of the consumers provided that:

a) such additions are made in accordance with the provisions of the competent authority and/or World Organization for Animal Health (WOAH); and
b) the nature and quantities of such additions are clearly stated upon each and every container of the feed or concentrate.

5.4 Annex C provides further information on the use of additives in horse feed.

6 Contaminants

6.1 Aflatoxins

Compounded horse feeds shall comply with the maximum limits for aflatoxin specified in Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Maximum limits for aflatoxin in compounded horse feed

S/N	Aflatoxin	Maximum limit ppb	Test method
i.	Total aflatoxin	20	ISO 16050
ii.	Aflatoxin B1	10	ISO 17375

6.2 Pesticide residues

Compounded horse feed shall not exceed the limits of pesticide residues established in the Codex Alimentarius Commission on Contaminants.

6.3 Heavy metals

Compounded horse feeds shall comply with the maximum limits of heavy metals specified in the Table 3 when tested with the methods therein.

Table 3 — Limits for heavy metals in compounded horse feed

S/N	Heavy metal	Maximum limit mg/kg	Test method
i.	Arsenic	2	ISO 27085
ii.	Lead	5	
iii.	Cadmium	0,5	

7 Hygiene, receiving, storage and transportation

7.1 Compounded horse feed shall be produced, transported, received and stored in accordance with the procedure described in the appropriate sections of FDARS 1828 and FDARS 2139.

7.2 Compounded horse feed shall comply with microbiological limits specified in Table 4 when tested in accordance with the test methods specified therein.

Table 4 — Microbiological requirements for compounded horse food

S/N	Microorganism	Requirement	Test method
i.	*Salmonella* spp in 25 g	Absent	ISO 6579-1
ii.	*Escherichia coli, cfu/g*	Absent	ISO 16654

8 Packaging

Compounded horse feed for sale shall be packaged in containers that are of sufficient strength and sufficiently sealed to withstand reasonable handling without tearing, bursting, or falling open. The containers shall be clean and not previously used.

9 Labelling

Each package of compounded horse feed shall be legibly and indelibly labelled with the following:

a) name and type of the feed;
b) name, physical address or contact information of manufacturer/producer/importer/exporter/packer;
c) nutrient composition;
d) net weight in SI units;
e) batch or code number;
f) list of feed ingredients including appropriate reference to additives;
g) date of manufacture;
h) best before/Expiry date; and
i) instruction for use, storage and handling.

10 Sampling

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

Annex A

(informative)

Description of common feedstuffs

Table A.1 — Description of common feedstuffs

S/N	Product	Description	Main nutritional constituent
1.	Alfalfa meal	Alfalfa as grown, dried, and processed, and to which no other matter has been added	Crude protein, Crude fibre
2.	Barley meal	The meal obtained by grinding barley, as grown, which shall be the whole grain together only with such other substances as may reasonably be expected to have become associated with the grain in the field.	Crude protein, Crude fibre
3.	Bean meal	The meal is obtained by grinding commercially pure leguminous beans (other than soya beans).	Crude protein, Crude fibre
4.	Blood meal	The meal has been dried out to which no other matter has been added	Crude protein, Dry matter
5.	Bone meal	Commercially pure steamed bone, raw or degreased, which has been ground or crushed and which contains phosphorus not less than 4.5 % phosphorus.	Crude protein, Phosphorus, Calcium
6.	Brewery and distillery grains	The product is obtained by drying the residue from distillery mash tube, and to which no other matter has been added	Crude fibre, Crude protein
7.	Cassava, dried	The dried root of the species *Manhot esculanta*	Crude fibre, Crude protein
8.	Clover meal	Clover as grown, dried and processed and to which no other matter has been added	Crude protein, Crude fibre
9.	Coconut cake	The residue resulting after part removal of oil and of cortex from commercially pure coconut kernels	Crude protein, Crude fibre
10.	Cotton seed cake	The residue resulting after part removal of oil and of cortex from commercially pure cotton seed	Crude protein, Crude fibre

11.	Sorghum meal	The meal obtained by grinding sorghum as grown which shall be the whole grain together only with such substances as may reasonably be expected to have become associated with the grain in the field.	Crude protein, Crude fibre
12.	Fish meal	A product, which may contain an added antioxidant but to which no other matter has been added, obtained by drying and grinding or otherwise treating fish or fish waste.	Crude protein, Oil, total ash.
13.	Grass, meal	Any product which, (i) is obtained by artificially drying any of the following: grass, clover, lucerne, green cereal, or any mixture consisting of any of them, and (ii) is otherwise as grown (that is to say including any growths harvested there with but with no other substance added thereto), and contains not less than 13 % crude protein calculated on the assumption that it contain 10 % moisture	Crude protein, Crude fibre
14.	Groundnut cake	The residue resulting after part removal of oil and part of non-removal of cortex from commercially pure groundnuts	Crude protein, Oil, crude fibre
15.	Maize	Maize kernel or crushed maize kernel as grown for commercial purposes	Crude protein
16.	Maize germ meal	Consisting mainly of embryo of kernel not less than 10 % oil, and not more than 5 % ash	?
17.	Maize and cob meal	Ground maize on the cob	Crude protein, Oil, crude fibre
18.	Maize meal	Milled whole maize	Crude protein, Oil, crude fibre
19.	Maize gluten meal	A by-product resulting from removal of a bran starch and germ from maize	Crude protein, Oil, crude fibre
20.	Meat and bone meal	A product, which may contain an added antioxidant but to which no other matter has been added, containing not less than 65 % protein, obtained by drying and grinding animal carcasses of portions thereof but excluding hair, have been preliminarily treated for the removal of fat	Crude protein, Oil, crude fibre

21.	Milk powder	Dried milk from which a substantial amount of fat has been removed and to which no other substance is added	Crude protein
22.	Millet	Finger millet of the species Eleusine coracana	Crude protein, Crude fibre
23.	Mineral mixture	Mixture of substances used whether in the form powder or licks and purporting to be essential for livestock	Percent of the mineral and trace elements
24.	Molasses	A concentrated syrup product obtained in the manufacture of sugar from sugar cane to which no other matter has been added	Dry matter, sugar as sucrose
25.	Oats, ground	The product obtained by grinding commercially pure oats	Crude protein, Crude fibre
26.	Pea meal	The meal obtained by grinding or crushing commercially pure peas including pods	Crude protein, Crude fibre
27.	Rice bran	The outside husk or rice kernel to which no other matter has been added	Crude protein, Crude fibre, oil
28.	Rice meal	The product obtained by grinding commercially pure rice after the removal of hulls and to which no other substance is added	Crude fibre, Crude protein, oil
29.	Rice polishings	The product obtained when polishing kernels after the removal of hulls and bran	Crude protein, oil, Crude fibre
30.	Sesame cake	The residue resulting after the part removal of oil from commercially pure simsim kernels	Crude protein, oil, Crude fibre
31.	Soya bean meal	The residue resulting after the part removal of oil from commercially pure soya bean seeds	Crude protein, oil, Crude fibre
32.	Sweet potatoes	The dried tubers of the species Ipomea batatas	Crude protein, Crude fibre
33.	Wheat meal	The meal obtained by grinding commercially pure wheat as grown and to which no other substance has been added	Crude protein, Crude fibre
34.	Wheat bran	Outside husk of what kernel to which no other matter was added	Crude protein, Crude fibre
35.	Wheat pollard	A by-product of wheat separated during production of flour not mentioned otherwise in this schedule containing	Crude protein, Crude fibre

		not more than 4 % of other than wheat vegetable substances	
36.	Yeast dried	The product obtained by drying of yeast or yeast residues, and to which no other matter has been added.	Crude protein
37.	Other feedstuffs	As may be described by the department of animal resources from time to time	?

Annex B

(informative)

Micronutrients in compounded horse feed

Table B.1 — Requirements for micro nutrients (vitamins and minerals) in compounded horse feed

S/N	Micro nutrient	Requirement
i.	Copper, ppm, min.	20
ii.	Zinc, ppm, min.	40
iii.	Iron, ppm, min.	80
iv.	Selenium, %, min.	0.1
v.	Biotin, ppm, min.	15
vi.	Vit A, I.U, min.	4 000
vii. ii.	Lysine, %, min.	0.4

Annex C
(Informative)

Additives used in horse feeds

C.1 Requirements for antioxidants

Horse feed shall contain no added antioxidant other than an antioxidant of a name or description specified in the first column of the table below, where an antioxidant if added should not exceed the maximum content, if any, specified in the second column of the Table C.1.

Table A.1 — Requirements for antioxidants in goats and sheep feeds

Name or description	**Maximum content in complete feed stuff,** mg/kg
L-Ascorbic acid Sodium L-ascorbate Calcium di (L-ascorbate) 5,6-Diacetyl-L-ascorbic acid 6-Palmitoyl-L-ascorbic acid Tocopherol-rich extracts of a natural origin Synthetic alpha-tocopherol Synthetic gamma-tocopherol Synthetic delta-tocopherol	According to the recommendation of GMPs
Propyl gallate Octyl gallate Dodecyl gallate	100, singly or in combination
Butylated hydroxyanisole (BHA)	150

A.2 Requirements for colourants in goats and sheep feed

Horse feed shall contain no colorant other than a colorant named or described in Table C.2 in accordance with the maximum content specified.

Egg yolk colouring or flavourings designed to improve the palatability of the feed may be included at the manufacturer’s discretion.

Table A.2 — Requirements for colorants in goats and sheep feeds

Name or description	**Maximum content in complete feed,** mg/kg
Patent Blue V Acid brilliant green BS	According to the recommendation of GMPs

C.3 Requirements for emulsifiers, stabilisers, thickeners and gelling agents

C.3.1 General

Horse feed shall contain no added emulsifier, stabiliser, thickener or gelling agent other than an emulsifier, stabiliser, thickener or gelling agent of a name or description, specified hereunder.

C.3.2 Name or description

Lecithins; Alginic acid; Sodium alginate; Potassium alginate; Ammonium alginate Calcium alginate; Prophylene glycol alginate (propane- 1,1-diol alginate) Agar; Carrageenan; Furcellaran; Locust bean gum (carob gum); Tamarind seed flour Gurar gum (gua flour); Tragacanth; Acacia (gum Arabic); Zanthan gum; D-glucitol (sorbitol); mannitol; Glycerol; Pectins; microcrystalline cellulose; Methylcellulose; Ethylcellulose; Hydroxylpropyl cellulose;Hydorxyprophylmethylcellulose; Ethylmethlcellulose; Carboxymethylcellulose;sodium salt; Sodium, potassium and calcium salts or edible fatty acids alone or in mixtures, derived from edible fat or distilled fatty acids Monoacyl and diacylglycerols esterified with the following acids: (a) acetic (b) lactic (c) citric (d) tartaric (e) monoacetylatartaric and (f) diacetyltartaric.

C.3.3 Sucrose esters or fatty acids

The following sucrose esters fatty acids may be added to goats and sheep feeds:

a) mixture of sucrose esters of monocyl and diacylglycerols (sucroglycerides, polyglycerides);

b) polyglycerol esters of non-polymerised edible fatty acids;

c) propylene glycol esters of fatty acids (propane-1,2-diol esters of fatty acids);

d) stearoyl-2-lactylic acid; sodium stearoyl-1,2-lacylate; calcium stearoyl-1,2-lactylate;

e) stearoyl-1-tartrate; glycerol poly (ethylene glycol) ricinolcate; dextrans; sorbitan monostearate;

f) sorbitan tristearte; sorbitan monolaurate; sorbitan mono-eleate; sorbitan monopalmitate;

g) partial polyglycerol esters of polycondensed fatty acids of castor oil (polyglycerol polyricinoleate) polyoxyethylene (20) sorbitan monolaurate;

h) polyoxyethylene (20) sorbitan monopalmitate, polyoxyethylene (20) sorbitan monostearate;

i) polyoxyethylene (20) sorbitan tristearate, polyoxyethylene (20) sorbitan monocleate;

j) polyoxyethylene (20) sorbitan tricleate, polyoxyethylene (8) sorbitan stearate; and

k) polyoxyethylene (40) stearate.

The emulsifiers, stabilisers, thickeners and gelling agents listed in Table 5 shall conform to the requirement in Table A.3.

Table C 3 — Requirements for emulsifiers, stabilisers, thickeners and gelling agents in horse feeds

S/N	Name or description	Kind of animal	Maximum content In complete feed, mg/kg
i.	Poly (ethylene glycol) 6 000	All goats and sheep	300
ii.	Polyoxypropylene-Polyoxyethelene polymers (M.W 6 800-9 000)	All goats and sheep	50
iii.	Propane-1,2-diol	Lambs , kids	36 000

A.4 Requirements for binders, anticaking agents and coagulants

A.4.1 General

Horse feed shall contain no added binder, anti-caking agent or coagulant other than a binder, anti-caking agent or coagulant of a name or description specified in 5.5.2.

A.4.2 Name or description

Lignosulphonates; Colloidal silica; Silicic acid, precipitate and dried; Sodium aluminosilicate, Sodium, potassium and calcium stearate; Kaolin and Kaslinitic clays free of asbestos- natural accruing mixtures of minerals containing at least 65% complex hydrated aluminium silicates whose main constituent in Kasolinite; Bentonite and other montmerillonitee clays; Vermiculite-hydrated silicate of magnesium, aluminium and iron; Citric acid; Kieselguhr (diatomaceous earth, purified); Calcium silicate (synthetic); Natural mixtures of steatite and chlorite free of asbestos.

A.5 Requirements for aromatic and appetising substances

Horse feed shall contain no added aromatic or appetising substance other than an aromatic or appetising substance of a name or description specified in Table C.4 and taking account of any such substance which is naturally present, without exceeding the maximum content specified.

Table A.4 — Requirements for aromatic and appetising substances

Name or description	Maximum content in complete feed mg/kg
Saccharin	No limits
All natural products and corresponding synthetic products	No limits

A.6 Permitted preservatives

Goats and sheep feed shall contain no added preservatives other than a preservative of a name or description specified hereunder.

a) sorbic acid, sodium sorbate, potassium sorbate, calcium sorbate;

b) folic acid;

c) ammonium formate, sodium formate, calcium formate;

d) acetic acid, potassium acetate, sodium diacetate;

e) latic acid, sodium lactate, potassium lactate, ammonium lactate, calcium lactate;

f) propionic acid, sodium propionate, potassium propionate;

g) L-Tartaric acid;

h) citric acid, sodium citrates, calcium citrates;

i) orthophosphoric acid;

j) fumaric acid;

k) DL-Malic acid; and

l) hydrochloric acid or sulphuric acid for use in silage only.

A.7 Undesirable substances

The presence in goats and sheep feed and feed ingredients of undesirable substances such as industrial and environmental contaminants, pesticides, radionuclides, persistent organic pollutants, pathogenic agents and toxins such as mycotoxins shall be identified, controlled and minimised.

Animal products that could be a source of the Bovine Spongiform Encephalopathy (BSE) agent should not be used for feeding directly to, or for feed manufacturing for goats and sheep.

Control measures applied to reduce unacceptable level of undesirable substances shall be assessed in terms of their impact on food safety.

Bibliography

N.R.C. (2007) Nutrient Requirements of Horses. National Research Council, Washington DC

ES 3450/2005 Processed horses feed