AFRICAN STANDARD

DARS 1831

First Edition 2024

Rabbit feeds — Specification

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Foreword

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ARSO shall not be held responsible for identifying any or all such patent rights.

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

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Introduction

To achieve efficient animal production, all nutrients should be provided in amounts necessary to meet the animal's requirements. The formulation of balanced diets that provide the correct amounts and proportions of these nutrients is essential to support the requirements for maintenance and production. Nutrient requirements become defined accurately through research trials so as to formulate diets more precisely. The standards presented in this document give the restrictions required for the prevention of poor animal performance.

The domestic rabbit is primarily herbivorous and will consume most types of grains, greens, and hay. Diets provided, whether home grown or commercially prepared, consist almost entirely of ingredients from plant sources. Although a few producers may still rely on homegrown feeds, a major portion of the rabbit feed presently used is commercial, pelleted feed. Since the rabbit can utilize a certain amount of forage, it has a place in food production by making use of some non-competitive feeds.

Rabbits habitually practice coprophagy, sometimes referred to as pseudorumination. This refers to the production of two kinds of fecal matter, one hard and one soft, the latter being consumed directly from the anus as it is excreted. This practice begins in rabbits shortly after they begin eating solid feed at about 3 to 4 weeks of age but is not practiced by germ-free rabbits. Fermentation in the large intestine and the practice of coprophagy probably provide the necessary amounts of most B vitamins, provide some bacterially synthesized protein, and may permit further digestion of *some* nutrients by multiple passage through the digestive tract. The high digestibility of forage protein in rabbits may be due partially to coprophagy.

Feeds may be produced by mixing various feeding stuffs or ingredients which may themselves vary in composition. The choice of raw materials mixtures will depend on locality, season and availability, economics and the quality of the product. The chemical composition of feedstuffs plays an important role in formulation of balanced and economical rations for various classes of animals. This is only possible when exact knowledge of the chemical composition of feedstuffs is available. Studies on the nutritive value of feedstuffs show differences between analytical values.

Annex A provides tolerances in analytical values for constituents of feeds. Values of some chemical compositions of common feedstuffs are given in Annex B. Annex C shows the main nutrient contribution of the various feedings stuffs.

In the preparation of this East African Standard, the following sources were consulted extensively:

US 813:2009, *Rabbit feeds — Specification*

Assistance derived from these sources is hereby acknowledged.

Rabbit feed — Specification

1 Scope

This Committee Draft African Standard specifies the requirements, sampling and test methods for rabbit feeds.

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 practice on good animal feeding*

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

AOAC 932.16, *Determination of Vitamin D3*

AOAC Official Method 935.14, *Iodine in mineral mixed feeds — Elmslie–Caldwell method*

AOAC Official Method 942.23, *Thiamine (vitamin B_1) in human and pet foods — Fluorometric method*

AOAC Official Method 944.12, *Folic acid (pteroylglutamic acid) in vitamin preparations — Microbiological methods*

AOAC Official Method 945.74, *Pantothenic acid in vitamin preparations — Microbiological methods*

AOAC Official Method 952.20, *Cobalamin (vitamin B_{12} activity) in vitamin preparations — Microbiological methods*

AOAC Official Method 961.14, *Niacin and niacinamide in drugs, foods, and feeds — Colorimetric method*

AOAC Official Method 961.15, *Vitamin B_6 (pyridoxine, pyridoxal, pyridoxamine) in food extracts — Microbiological method*

AOAC Official Method 965.28, *Antioxidants in food — Qualitative colour tests*

AOAC Official Method 968.17, *Butylated hydroxyanisole and butylated hydroxytoluene in Cereals — Gas chromatographic method*

AOAC Official Method 970.65, *Riboflavin (vitamin B_2) in foods and vitamin preparations — Fluorometric method*

AOAC Official Method 974.29, *Vitamin A in mixed feeds, premixes, and human and pet foods — Colorimetric method*

AOAC Official Method 974.30, *Menadione sodium bisulfite (water-soluble vitamin K_3) in feed premixes — Gas chromatographic method*

AOAC Official Method 975.08, *Fluorine in animal feed — Distillation method — Ion selective electrode method*

AOAC Official Method 977.26, *Clostridium botulinum and its toxins in foods — Microbiological method*

AOAC Official Method 981.15, *Riboflavin in foods and vitamin preparations — Automated method*

AOAC Official Method 981.16, *Niacin and niacinamide in foods, drugs, and feeds — Automated method*
AOAC Official Method 983.26, *Differentiation of members of Bacillus cereus group — Microbiological method*
AOAC Official Method 984.26, *Vitamin C (Total) in Food — Semiautomated Fluorometric Method*
AOAC Official Method 988.15, *Tryptophan in foods and food and feed ingredients — Ion exchange chromatographic method*
AOAC Official Method 994.12, *Amino acids in feeds — Performic acid oxidation with acid hydrolysis — Sodium metabisulfite method*
AOAC Official Method 996.16, *Selenium in feeds and premixes*
AOAC *Determination of biotin by high-performance liquid chromatography in infant formula, medical nutritional products, and vitamin premixes*
AOAC Official Method 999.13, *Lysine, methionine, and threonine in feed grade amino acids and premixes*
AOAC Official Method 999.14, *Choline in infant formula and milk — Enzymatic colorimetric method*
ISO 2591-1, *Test sieving — Part 1: Methods using test sieves of woven wire cloth and perforated metal plate*
ISO 5510:1984, *Animal feeding stuffs — Determination of available lysine*
ISO 5984:2002, *Animal feeding stuffs — Determination of crude ash*
ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*
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 6492, *Animal feeding stuffs — Determination of fat content*
ISO 6496, *Animal feeding stuffs — Determination of moisture and other volatile matter content*
ISO 6497:2002, *Animal feeding stuffs — Sampling*
ISO 6654, *Animal feeding stuffs — Determination of urea content*
ISO 6865, *Animal feeding stuffs — Determination of crude fibre content — Method with intermediate filtration*
ISO 6866, *Animal feeding stuffs — Determination of free and total gossypol*
ISO 6867, *Animal feeding stuffs — Determination of vitamin E content — Method using high-performance liquid chromatography*
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 7937, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of Clostridium perfringens — Colony-count technique*
ISO 13903, *Animal feeding stuffs — Determination of amino acids content*
ISO 13904, *Animal feeding stuffs — Determination of tryptophan content*
ISO 14565, *Animal feeding stuffs — Determination of vitamin A content — Method using high-performance liquid chromatography*

ISO 14718, *Animal feeding stuffs — Determination of aflatoxin B_1 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 B_1*

ISO 27085, *Animal feeding stuffs — Determination of calcium, sodium, phosphorus, magnesium, potassium, iron, zinc, copper, manganese, cobalt, molybdenum, arsenic, lead and cadmium by ICP-AES*

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

3 Definitions

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

3.1
crude fibre
residue obtained after acid and alkaline digestion of a rabbit feed sample that contains cellulose, hemicellulose and lignin

3.2
crude fat
total fat content of rabbit feed determined by a laboratory test

3.3
digestible energy
amount of the useful energy in rabbit feed that represents that portion of the feed gross energy not lost in feaces, urine and gaseous products of fermentation (calculated from chemical composition)

3.4
total ash
inorganic part of a rabbit feed consisting of mineral elements determined in a laboratory by incineration at a high temperature and weighing the residue

3.5
acid insoluble ash
part of the total ash remaining after treatment with hydrochloric acid

3.6
minerals
measure of the content of individual minerals in rabbi feed

3.7
moisture content
mass fraction of substances lost on drying the feed sample by using the accredited procedure

3.8
additive

substance intentionally added to feed and/or water, not consumed as feed by itself, whether or not it has a nutritional value, that affects the characteristics of food including organoleptic properties, animal products, animal production or performance or welfare, or the environment

3.9
antioxidant
substance prolonging the storage life of rabbit feed and feed ingredients by protecting them against deterioration caused by oxidation

3.10
crude protein
total protein content of rabbit feed which is determined by analysing the nitrogen content of feed and multiplying the result by a factor

4 Requirements

4.1 Ingredients for rabbit feeds

4.1.1 All ingredients and raw materials shall be of high quality and not deteriorated.

4.1.2 Where standards have been declared for ingredients or raw materials, such ingredients or raw materials shall conform to such standards. Annex A and B provides further information on the nutrient composition of some common feed ingredients and description of common feedstuffs respectively.

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

4.2 General requirements

4.2.1 Rabbit feed may be in form of cubes or pellets.

4.2.2 Rabbit feed shall be palatable.

4.2.3 Rabbit 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.

4.3 Nutrient composition of rabbit feed

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

4.3.2 Whole or ground cottonseed shall not comprise more than 8 % of a feed, and no feed shall contain more than 0.02 % gossypol when teste in accordance with the requirements of ISO 6866.

4.3.3 Urea or any other non-protein nitrogen (NPN) sources shall not be added to or included in compounded rabbit feed.

5 Specific requirements

5.1 Requirements for nutrients, vitamins and minerals

Rabbit feed shall comply with the nutrient requirements specified in Table 1 when tested with the test methods specified therein.

Table 1 — Specific requirements of rabbit feed

S/N	Nutrients	Growth	Maintenance	Gestation	Lactation	Test method
i	Digestible energy min, kcal/kg	2 500	2 100	2 500	2 700	ISO 9831
iii	Crude Fiber, %	10 - 12	10 - 14	10 - 12	10 - 12	ISO 5498
iv	Crude Fat, min. %	2	2	2	2	ISO 11058
v	Crude Protein, min %	16	12	15	17	ISO 5983-1
vi	Calcium, min, %	0.4	0.6	0.45	1.1	ISO 6490-1
vii	Magnesium, mg/kg	300 - 400	300 - 400	300 - 400	300 - 400	ISO 6869
viii	Available phosphorus, min %	0.22	0.4	0.37	0.5	ISO 6491
ix	Potassium, min %	0.6	0.6	0.6	0.6	ISO 6869,
x	Sodium chloride, max. %	0.5	0.5	0.5	0.5	ISO 6495
xi	Zinc, mg/kg*	50	50	70	70	ISO 6869
xii	Sodium, min %*	0.2	0.2	0.2	0.2	ISO 6869
xiii	Chlorine, min%*	0.3	0.3	0.3	0.3	*ISO 1841-2,*
xiv	Copper, mg/kg*	3	3	3	3	ISO 6869
xv	Iodine, mg/kg*	0.2	0.2	0.2	0.2	AOAC 935.14
xvi	Iron, mg/kg*	50	50	50	50	AOAC ISO 6869
xvii	Manganese, mg/kg*	8.5	2.5	2.5	2.5	ISO 6869

Annex C provides further information on the tolerance limits on analytical constituents in rabbit feed

6 Feed additives

6.1 General requirements on additives

6.1.1 Additives in the following categories may be used in rabbit feeds:

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; and
i) 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 conform to the provisions of this standard should be stated in the label (see also Clause 10).

6.1.2 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.

6.1.3 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.

6.1.4 Annex D provides further information on additives that may be used in rabbit feeds

7 Hygiene, receiving, storage and transportation

71 Rabbit feed shall be processed and handled in accordance with the requirements of FDARS 2139

7.2 Rabbit feed shall be produced, transported, received and stored in accordance with the procedure described in the appropriate sections of FDARS 1828.

8. Contaminants

8.1 Mycotoxin

Rabbit feed shall comply with those maximum limits for mycotoxins as specified in Table 9 when tested in accordance with the methods specified therein.

Table 2 — Maximum limits of mycotoxins for rabbit feed

S/N	mycotoxin	Maximum limit ug/kg	Test method
i.	Total Aflatoxin	20	ISO 16050
ii.	Aflatoxin B1	10	ISO 14718 ISO 17375
iii.	Ochratoxin A	5	ISO 15141
iv.	Fumonisin	5	AOAC 2001.04-2001

8.2 Pesticide residue

Rabbit feed shall not exceed the limits of pesticide residues established in the Codex Alimentarius Commission on contaminants

8.3 Heavy metals

Rabbit feed shall comply with the limits of heavy metals as specified in Table 10 when tested in accordance with the methods specified therein

Table 10 — Maximum metals limits for compounded rabbit feed

S/N	Heavy metal	limit mg/kg	Test method

i.	Arsenic	2.0	ISO 27085
ii.	Lead	5.0	
iii.	Cadmium	1.0	
iv.	Mercury	0.1	

8.4 Microbiological limits

Rabbit feed shall comply with the microbiological limits specified in Table 11 when tested with the methods specified therein.

Table 11 — Limits for compounded rabbit

S/N	Parameter	Limit	Test method
i.	*Salmonella spp.* in 25 g	absent	ISO 6579-1
ii.	*Eschericia coli* cfu/g	absent	ISO 16654

9 Packaging and labelling

9.1 Packaging

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

9.2 Labelling

Each package of rabbit feed shall be legibly and indelibly marked with the following information:

a. name and type of the rabbit feed;
b. name and address or contact information of manufacturer;
c. designation of the feed or concentrate;
d. nutrient composition;
e. weight in SI units;
f. batch or Code number;
g. directions and precautions for use, if a concentrate, the proportion which in it is to be mixed with the basal ingredient;
h. list of feed ingredients;
i. date of manufacture;
j. best before date; and
k. directions for use.

10 Sampling

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

Annex A
(informative)

Nutrient composition of common feed ingredients

Studies on nutritive value of feedstuffs show differences between analytical values and those which are already tabulated in various feeding standards. Chemical composition of feedstuffs play an important role in formulation of balanced and economical rations for various classes of animals. It is only possible when exact knowledge of chemical composition of feedstuffs are available. This table presents values of some chemical composition of common feedstuffs.

Ingredients	DM, %	CP, %	CF, %	Ca, %	P,\ %	ME, Kcal/kg	Lysine, %	Methionine, %
Maize	88	8	12	0.17	0.55	3 000	0.53	0.29
Maize bran	88	9.4	13	0.04	1.03	2 200	0.18	0.21
Maize/cob meal	88	7	8		0.30			
Rice bran	88	13.5	6.5	0.06	1.43	3 000	0.5	0.22
Cassava meal	88	2.8	4.0	0.3	0.05	3 000	-	-
Molasses	75	3.0		0.75	0.08	2 330	-	-
Millet	88	10.5	2.0	0.05	0.40	1 392	0.2	0.27
Sorghum	88	9.0	2.1	0.03	0.28	3 250	0.2	0.12
Fish meal	88	60.0	1.0	4.37	2.53	2 310	4.08	1.70
Blood meal	92	72.9	1.7	0.28	0.22	1 177	7.0	0.9
Cotton seed cake	88	40.0	14	0.20	1.20	968	1.6	0.52
Soya bean meal	88	43.0	6	0.53	0.64	2 800	2.84	0.65
Limestone	98	-	-	38.0	-	-	-	-
Oyster shells	98	-	-	35.0	-	-	-	-
Wheat pollard	98	15.0					0.60	0.35
Wheat bran	91.4	15.0	12.5		1.20		0.60	0.35
Sunflower cake	92	35.0	26.7				1.80	1.20
Groundnut cake	93	40.0	7.3				2.00	1.80
Rice polishings	92.5	12.0	4.2				4.0	0.40
Bone meal	94	24	1.5					
Dicalcium phosphate				24	18			
Tricalcium phosphate				38	19			
Meat meal		60.0					0.50	1.0
Alfalfa hay	87.5	18.9	33.1					
Sugarcane bagasse	90.5	1.7	50.3					
Sesame cake	93	36.1	6.7					
Sugarcane tops	33.5	6.2	29.5					
Whey	90	13.0	1.3	0.97	0.76	3 100		0.2

Annex B
(informative)

Description of common feedstuffs

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 obtained by grinding commercially pure leguminous beans (other than soya bean).	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 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
11. Cotton seed cake	The residue resulting after part removal of oil and of cortex from commercially pure cotton seed	Crude protein, Crude fibre
12. 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
13. 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.
14. 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
15. 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
16. Maize	Maize kernel or crushed maize kernel as grown for commercial purposes	Crude protein
17. Maize germ meal	Consisting mainly of embryo of kernel not less than 10 % oil, and not more than 5 % ash	

18. Maize and cob meal	Ground maize on the cob	Crude protein, Oil, crude fibre
19. Maize meal	Milled whole maize	Crude protein, Oil, crude fibre
20. Maize gluten meal	A by-product resulting from removal of a bran starch and germ from maize	Crude protein, Oil, crude fibre
21. 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
22. Milk powder	Dried milk from which a substantial amount of fat has been removed and to which no other substance is added	Crude protein
23. Millet	Finger millet of the species *Eleusine coracana*	Crude protein, Crude fibre
24. 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
25. 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
26. Oats, ground	The product obtained by grinding commercially pure oats	Crude protein, Crude fibre
27. Pea meal	The meal obtained by grinding or crushing commercially pure peas including pods	Crude protein, Crude fibre
28. Rice bran	The outside husk or rice kernel to which no other matter has been added	Crude protein, Crude fibre, oil
29. 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
30. Rice polishings	The product obtained when polishing kernels after the removal of hulls and bran	Crude protein, oil, Crude fibre
31. Sesame cake	The residue resulting after the part removal of oil from commercially pure simsim kernels	Crude protein, oil, Crude fibre
32. Soya bean meal	The residue resulting after the part removal of oil from commercially pure soya bean seeds	Crude protein, oil, Crude fibre
33. Sweet potatoes	The dried tubers of the species *Ipomea batatas*	Crude protein, Crude fibre
34. 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
35. wheat bran	Outside husk of what kernel to which no other matter was added	Crude protein, Crude fibre
36. Wheat pollard	A by-product of wheat separated during production of flour not mentioned otherwise in this schedule containing not more than 4 % of other than wheat vegetable substances	Crude protein, Crude fibre
37. Yeast dried	The product obtained by drying of yeast or yeast residues, and to which no other matter has been added.	Crude protein
38. Other feedstuffs	As may be described by the Department of Animal Resources from time to time	

Annex C
(informative)

C.1 Additional requirements for rabbit feed

	Vitamins			
	Growth	**Maintenance**	**Gestation**	**Lactation**
Vitamin A (IU/kg)	6 000		12 000	12 000
Vitamin D3(IU)/kg	900	900	900	900
Vitamin E(mg)/kg	50	50	50	50
Vitamin K(mg)/kg	0	0	2	2
Amino Acids				
Lysine %	0.6	-	-	0.75
Methionine + Cysteine	0.6	-	-	
Arginine	0.9	-	-	0.8
Histidine	0.35	-	-	0.43
Leucine	1.05	-	-	1.25
Isoleucine	0.6	-	-	0.7
Tryptophan	0.18	-	-	0.22
Valine	0.7	-	-	0.85

C. 2 Tolerance limits on analytical constituents in rabbit feeds

Analytical constituents	Limits of variation (% by weight except where otherwise stated)
Ash	If present in excess 2 % for declaration of 10 % or more 20 % for the amount stated for declarations 5 % or more but less than 10 % 1 % for declarations of less than 5 %. If present is deficient 3 % for declaration of 10 % or more 30 % for the amount stated for declarations 5 % or more but less than 10 % 1.5 % for declarations of less than 5 %.
Calcium	If present in excess 3.6 % for declaration of 16 % or more 22.5 % for the amount stated for declarations 12 % or more but less than 16 % 2.7 % for declarations of 6 % or more but less than 12 %. 45 % for the amount stated for declarations 1 % or more but less than 6 % 0.45 % for declarations of less than 1 %. If present is deficiency 1.2 % for declaration of 16 % or more 7.5 % for the amount stated for declarations 12 % or more but less than 16% 0.9 % for declarations of 6 % or more but less than 12 %. 15 % for the amount stated for declarations 1 % or more but less than 6 % 0.15 % for declarations less than 1 %.
Cystine	In case of deficiency 20 % of the amount stated
Fibre	If present in excess: 1.8 % for all declarations If deficient: 45 % of the amount stated
Lysine	In case of deficiency 15 % of the amount stated If present in excess 4.5 % for declaration of 1 % or more 30 % of the amount stated for declarations 7.5 % or more but less than 15 % 2.25 % for declarations of 5 % or more but less than 7.5 %. 45 % for the amount stated for declarations 0.75 % or more but less than 5 % 0.3 % for declarations of less than 0.7 %.
Methionine	In case of deficiency 15 % of the amount stated If present in excess 1 % for declaration of 10 % or more 10 % of the amount stated for declarations 5 % or more but less than 10 % 0.5 % for declarations of less than 5 %.
Oil	In case of deficiency 1.5 % for declarations of 15 % or more 10 % of the amount for declarations of 8 % or more but less than 15 % If present in excess 3 % for declaration of 15% or more 20 % of the amount stated for declarations 8 % or more but less than 15 % 0.8 % for declarations less than 8 %

Phosphorus	If present in excess 3.6 % for declaration of 16 % or more 2.25 % of the amount stated for declarations 12 % 45 % of the amount stated for declarations 1 % or more but less than 6 % 0.45 % for declarations of less than 1 %. In case of deficiency 1.2 % for declaration of 16 % or more 7.5 % of the amount stated for declarations of 12 % or more but less than 16 % 0.9 % of the amount stated for declarations of 6 % or more but less than 12 % 15 % of the amount stated for declarations of 1 % or more but less than 6 % 0.15 % for declarations 1 % less than 1 %
Sodium	If present in excess 4.5 % for declaration of 15 % or more 30 % of the amount stated for declarations 7.5 % or more but less than 15 % 2.25 % of the amount stated for declarations 5 % or more but less than 7.5 % 0.45 % for declarations of 0.7 % or more but less than 5 %. In case of deficiency 1.5 % for declaration of 15 % or more 10 % of the amount stated for declarations of 7.5 % or more but less than 15 % 0.75 % of the amount stated for declarations of 5 % or more but less than 7.5 % 15 % of the amount stated for declarations of 0.7 % or more but less than 5 % 0.1 % for declarations less than 0.7 %
Starch and total sugar	If present in excess 5 % for declaration of 25 % or more 20 % of the amount stated for declarations 10 % or more but less than 25 % 2 % of the amount stated for declarations less than 10 %. In case of deficiency 2.5 % for declaration of 25 % or more 10 % of the amount stated for declarations of 10 % or more but less than 25 % 1 % for declarations less than 1 %
Total sugar expressed as sucrose	If present in excess 4 % for declaration of 20 % or more 20 % of the amount stated for declarations 10 % or more but less than 20 % 2 % of the amount stated for declarations less than 10 %. In case of deficiency 2 % for declaration of 20% or more 10 % of the amount stated for declarations of 10 % or more but less than 20 % 1 % for declarations less than 10 %
Ash insoluble in hydrochloric acid	If present in excess 10 % for declaration of more than 3 % 0.3 % of the amount stated for declarations of 3 % or less
Carotene	In case of deficiency, 30 % of the amount stated
Chlorides expressed as NaCl	If present in excess 10 % for declaration of more than 3 % 0.3 % of the amount stated for declarations of 3 % or less
Magnesium	In case of deficiency 1.5 % for declaration of 15 % or more 10 % of the amount stated for declarations of 2 % or more but less than 15 %

	0.2 % for declarations less than 2 %
Minerals	
Cobalt	± 50 % of the amount stated for declarations above 200 mg/kg
Copper	± 30 of the amount stated for declarations above 200 mg/kg ± 50 of the amount stated for declarations up to an including 200 mg/kg
Iodine	± 50 % of the amount stated for declarations of 250 mg/kg or more
Iron	± 50 % of the amount stated for declarations less than 250 mg/kg
Manganese	± 50 % of the amount stated
Molybdenum	± 50 % of the amount stated
Selenium	± 50 % of the amount stated
Zinc	± 50 % of the amount stated
Vitamins	
Vitamin D_2 and D_3	± 30 of the amount stated for declarations above 4000 IU/kg ± 50 of the amount stated for declarations up to an including 4000 IU/kg
Vitamins other than D2 and D3	In case of deficiency ± 30% of the amount stated

Annex D
(informative)

Additives for rabbit feed

D.1 Requirements for antioxidants in rabbit feed

Rabbit 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 E 1.

Table E. 1 — Requirements for antioxidants in rabbit 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

D.2 Requirements for colourants in rabbit feed

Rabbit feed shall contain no colorant other than a colorant named or described in Table E.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 E.2 — Requirements for colorants in rabbit feeds

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

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

D.3.1 General

Rabbit 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.

D.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.

D.3.3 Sucrose esters or fatty acids

The following sucrose esters fatty acids may be added to rabbit 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 E.3 shall conform to the requirement in Table E.3.

Table D.3 — Requirements for emulsifiers, stabilisers, thickeners and gelling agents in rabbit feeds

Name or description	Maximum content in complete feed, mg/kg
Poly (ethylene glycol) 6000	300
Polyoxypropylene-polyoxyethelene polymers (M.W 6 800 - 9 000)	50

D.4 Requirements for binders, anti-caking agents and coagulants

D.4.1 General

Rabbit 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 E.4.2.

D.4.2 Name or description

Lingnosulphonates; 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.

D.5 Requirements for aromatic and appetising substances

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

Table D.4 — Requirements for aromatic and appetising substances

Name or description	Maximum content in complete feed mg/kg
Saccharin All natural products and corresponding synthetic products	According to the recommendation of GMPs

D.6 Permitted preservatives

Rabbit 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. lactic 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.

D.7 Undesirable substances

The presence in rabbit 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.

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

Bibliography

N.R.C. (1977) Nutrient Requirements of Rabbits. National Research Council, Washington DC
ES 3463/2005 Processed rabbit feed