F.E.D.I.A.F.

NUTRITIONAL GUIDELINES FOR FEEDING PET RABBITS

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FEDIAF – EUROPEAN PET FOOD INDUSTRY FEDERATION / Av. Louise 89 / B-1050 Bruxelles / Tel.: +32 2 536.05.20 / www.fediaf.org

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The glossary contains definitions of key words used in Small Animal Nutrition in this Guideline followed by the source of the definition. Whenever appropriate, definitions are adapted to pet food.

II. GLOSSARY

Additive (feed additive)	Substances, micro-organisms or preparations, other than feed material and premixtures, which are intentionally added to pet food or water in order to perform, in particular, one or more of the functions mentioned in Article 5(3) of regulation 1831/2003	Regulation 1831/2003 on additives for use in animal nutrition (Art 2 (2) (a)) adapted to pet food
ADF	Acid Detergent Fibre	See section V
ADL	Acid Detergent Lignin	See section V
Caecum of the rabbit	The unique musculature of the colon allows the intestinal tract of the rabbit to separate fibrous material from more digestible material; the fibrous material is passed as faeces, while the more nutritious material is passed into the caecum, then encased in a mucous covering and passed as a caecotroph (see caecotrophy).	
Caecotrophy	Process by which soft faeces (caecotrophes) are excreted and systematically re-ingested from the anus, mainly in the early morning. These caecotrophes come direct from the caecum and have a high protein (essential amino acids), vitamin and mineral content.	
Complementary pet food	Pet food which has a high content of certain substances but which, by reason of its composition, is sufficient for a daily ration only if used in combination with other foods.	Regulation 767/2009 on the marketing and use of feed (Art. 3 (1) (j)) adapted to pet food
Complete pet food	Pet food which, by reason of its composition, is sufficient for a daily ration.	Regulation 767/2009 on the marketing and use of feed (Art. 3 (1) (i)) adapted to pet food
Compound feed	Pet food consisting of a mixture of at least two feed materials, whether or not containing additives, for oral feeding in the form of complete or complementary pet food.	Regulation 767/2009 on the marketing and use of feed (Art. 3 (1) (h)) adapted to pet food
Daily ration	The average total quantity of feedingstuffs, calculated on a moisture content of 12%, required daily by an animal of a given species, age category and yield, to satisfy all its needs. The above-mentioned legal definition means the average total quantity of a specific pet food that is needed daily by a pet of a given species, age category and life style or activity to satisfy all its energy and nutrient requirements.	Regulation 1831/2003 on additives for use in animal nutrition (Art 2 (2) (f)) adapted to pet food
Digestible energy (DE)	The gross energy less the gross energy of faeces resulting from the consumption of that pet food.	McDonald et al, (1995)
Dietary enrichment	Feed or nutrients provided to the animal in addition to the manufactured or prepared diet	
DM	Dry Matter	
Feed materials	Means products of vegetable or animal origin, whose principal purpose is to meet animals' nutritional needs, in their natural state, fresh or preserved, and products derived from the industrial processing thereof, and	Regulation 767/2009 on the marketing and use of feed (Art. 3 (1) (g))

	organic or inorganic substances, whether or not containing feed additives, which are intended for use in oral animal-feeding either directly as such, or after processing, or in the preparation of compound feed, or as carrier of premixtures.	
Fibre	A generic term that refers to plants carbohydrate component that cannot be broken up by intestinal enzymes of the foregut	
Forage	Non-manufactured hay, grass and wild plants	
Maintenance energy requirement (MER)	The energy required to support energy equilibrium, (where ME equals heat production), over a long period of time.	Blaxter (1989)
Metabolizable energy (ME)	The digestible energy less the energy lost in urine and combustible gases.	McDonald et al (1995)
NRC	National Research Council (USA) is a council which is organised by the US National Academy of Sciences. The NRC Sub Committee on Rabbit Nutrition has compiled the nutrient requirements of rabbits 1977.	www.national-academies.org
NSP	Non Starch Polysaccharides	
Nutritional maximum limit	The maximum level of a nutrient in a complete pet food that, based on scientific data, has not been associated with adverse effects in healthy dogs and cats. Levels exceeding the nutritional maximum may still be safe, however, no scientific data are currently known to FEDIAF.	FEDIAF 2011
Pet food	Any product produced by a Pet food manufacturer, whether processed, partially processed or unprocessed, intended to be ingested by pet animals after placing on the market.	FEDIAF 2011
RA	Recommended Allowance.	
Recommendation	See Allowance	
SUL	Save Upper Limit	
TDF	Total Dietary Fibre	

III. INTRODUCTION

FEDIAF represents the national pet food industry associations in the EU and from Bosnia-Herzegovina, Croatia, Norway, Serbia, Switzerland and Russia, and is the spokesman for approximately 650 companies across Europe.

One of FEDIAF's main objectives is to maintain the well-being of pets by the provision of safe, well balanced and nutritionally sound pet food through its member companies. Therefore FEDIAF has compiled on the basis of work prepared by its British member PFMA the present **"Nutritional Guidelines for Feeding Pet Rabbits"** which is based on the state of the art knowledge on pet rabbit nutrition, providing pet food manufacturers with nutritional recommendations to ensure the production of well balanced and nutritionally sound diet and thus pet food for adult and growing pet rabbits. The guide does not include detailed information on reproduction, but it is hoped to do so in future. It is also important to note that this is a guide to the pet rabbit's daily diet, which can be delivered in a variety of ways (e.g. different sources of fibre).

These Guidelines are aimed at helping manufacturers developing and producing balanced rabbit nutrition for a long and healthy life of the animals.

This document is reviewed regularly and updated whenever there are new relevant technological, scientific or legislative developments in pet rabbit nutrition.

IV. BASIC PRINCIPLES

OBJECTIVES AND SCOPE

The objectives of FEDIAF's **Nutritional Guidelines for Feeding Pet Rabbits** are:

i) To contribute to the production of nutritionally balanced pet food for rabbits, while complying with relevant EU legislation on animal nutrition. To achieve this objective, the guidelines incorporate up-to-date scientific knowledge on rabbit nutrition to:
   - Provide practical nutrient recommendations for pet food manufacturers when formulating their products for adult and growing rabbits.
   - Help pet food manufacturers to assess the nutritional value of commercial rabbit foods for healthy animals.
   - Provide guidance on some unique aspects of pet rabbit nutrition such as fibre requirements for their unique digestive tract.

ii) To be the reference document on pet rabbit nutrition in Europe for EU and local authorities, consumer organisations, professionals, and customers.

iii) To enhance cooperation between pet food manufacturers, pet care professionals and competent authorities by providing scientifically sound information on the formulation and assessment of pet foods for rabbits.

iv) To complement FEDIAF's Guide to Good Practice for the Manufacture of Safe Pet Foods and the FEDIAF's Code for Good Labelling Practice for Pet Food.

FEDIAF's Nutritional Guidelines provide information on several aspects of food and nutrition:

i) Recommendations for adequate and safe nutrient levels for the design of commercial complete and complementary foods for pet rabbits;

ii) Tools for the assessment of the nutritional value of pet rabbit foods;

iii) Recommendations for energy intake;

iv) Typical ingredients suitable for use in rabbit foods;

v) Different types of fibres: sources, and their role for rabbits;

vi) Specific topics for rabbit nutrition, including selective feeding and supplementation of foods.

FEDIAF's Nutritional Guidelines give nutrient recommendations for healthy rabbits eating typical commercial pet foods.

- The levels in this guide reflect the amounts of essential nutrients to ensure adequate and safe nutrition in healthy individuals when consumed over its lifetime.
- These guidelines relate to pet rabbit foods manufactured from typical ingredients which are commonly used in rabbit feed.
- The nutrient levels include a safety margin for individual animal variation and nutrient interactions.
- It follows from the above statements that individual pet foods can be adequate and yet outside the recommendations, based on the manufacturer's own substantiation of nutritional adequacy and or feeding recommendations for said specific commercial food.

Unlike for other pet animals, there is also a significant market for rabbit feed produced for animals that are bred and reared for commercial purposes, including as food for humans. In terms of nutrition, some basic requirements are similar for both pet and commercial rabbits, and much information about rabbit nutrition comes from studies with commercial rabbits. Some practical issues arise, in particular with product labelling and safe manufacture ensuring that animal proteins do not enter the human food chain.

Excluded from FEDIAF's Nutritional Guidelines are foods for particular nutritional purposes (such as diets fed under veterinary supervision) and some other specialised foods.

TYPES OF INGREDIENTS

The table of nutrients given in a later section defines those nutrients known to be required in a food for pet rabbits. These nutrients need to be presented to the rabbit as a palatable food, and this section describes the more common ingredients (termed feed materials by the EU). Feed materials given on pet rabbit food labels may be listed as either individual feed materials, or in categories (defined in Directive 82/475) if the product is produced for pet rabbits only. It should be noted that use of feed materials and terms from the list given in Annex V which is taken from the EU catalogue is voluntary, and choice of other feed materials or name descriptors is permitted. The Catalogue and Annex V is indicative and producers must ensure that the raw materials used are safe. Further details are given in Annex II, under 'Labelling of Pet Rabbit Foods'.

<u>Common feed materials and additives for rabbit foods.</u>

Rabbits need a high level of fibre in their diet, and hay is the most common feed material for

supplying this, but several other high fibre feed materials are used, with some commonly used ones given in a non-exhaustive list in Annex V. Other feed materials are added as good sources of proteins, including soybean meal. Certain feed materials are added as source of particular nutrients, such as linseed for omega 3 fatty acids. Some feed materials such as carrots are very palatable to rabbits, but caution is required with the amount fed due to the high sugar content. Finally, pet rabbits need vitamins, trace elements and minerals. Some are presented in the natural feed materials, but many are supplemented by using a premix. Calcium may also be added separately via a premix in one of its mineral forms, such as calcium carbonate or di-calcium phosphate. Trace elements and vitamins are classified as additives, whereas sources of the major minerals such as calcium carbonate and di-calcium phosphate are classified as feed materials and not additives.

ENERGY INTAKE

A good guide for the appropriate energy intake for the pet rabbit would be:

i. Maintenance = 100kcal ME x body weight $^{0.75}$. (Where body weight is expressed in kg and ME is metabolisable energy)
Alternatively
Maintenance = 0.42MJ ME x body weight $^{0.75}$.
ii. Growth would be a multiple of 1.9 to 2.1 from this value.
iii. Similarly, gestation a multiple of 1.35-2 as pregnancy progresses and lactation a multiple of 3
(Tobin, G. (1996))

It may be assumed that for a pet rabbit a daily dry matter (DM) intake of 3-5% bodyweight would be typical, however a very wide variation between individuals and according to the energy density of the diet is observed and in some cases intakes may be in excess of these values.

Prediction equations for the digestible energy (DE) content of diets tend to overestimate those with high levels of digestible fibre whilst underestimating those with added fat. Fibre plays an important role in the energy supply of the rabbit and consequently it is desirable to consider the contribution to dietary energy content in energy prediction equations. However, it is recognised that where analytical facilities are limited it may be more appropriate to use the following equation which provides reasonable practical predictions of DE.

DE= -1801 + 7.10CP + 12.01EE + 5.59NFE

Where DE is Kcal.kg^{-1}; CP is crude protein; EE is ether extract; NFE is nitrogen free extract (= 1000 - CP - EE - Crude Fibre - Ash - Moisture) each in g.kg^{-1} as fed.

To convert the DE value to MJ.kg^{-1} a multiplication of 0.004184 is required. The proportion of ME of DE for the rabbit could be taken as between 0.9 to 0.95.
Based on the following equation: ME/DE = 0.995 – 0.0048 x digestible protein g.kg^{-1} / DE MJ.kg^{-1}
(Xiccato, G. And Trocino, A. (2010) Energy and protein metabolism and requirements. In: Nutrition of the Rabbit 2nd Edition eds: C de Blas and J Wiseman).
DE remains a common and practical basis for energy calculations for rabbit feeding.
Should information or analytical facilities be available as to the fibre content of a feed or a feeding stuff then a more appropriate equation, which takes into account a proportion of the dietary fibre, may be used (Villamide et al, 2009):

DE=0.013CP + 0.036EE + 0.017NFC + 0.006NDF

Where DE is MJ.kg^{-1} from analysis in g.kg^{-1}; CP is crude protein, EE is ether extract, NFC = organic matter less crude protein, ether extract and NDF, NDF is neutral detergent fibre, assayed with a heat stable amylase and expressed exclusive of residual ash. Mertens, D.R. (2002) Gravimetric determination of amylase –treated NDF in feeds with refluxing in beakers or crucibles: collaborative study J AOAC 85 1217-1240; Mertens, D.R. (2003) Challenges in measuring insoluble dietary fibre. J Anim Sci **81** 3233-3249; EGRAN (2001) technical note: attempts to harmonise chemical analysis of feeds and faeces for rabbit feed evaluation. World Rabbit Science **9** 57-64

For a more comprehensive review of this subject a number of chapters in 'Nutrition of the Rabbit' 2nd Edition by De Blas and Wiseman (2010) could be consulted.

INRA (2004) published values for nutrient content of feeds also provide a useful "text-book" source for rabbit DE values for feed ingredients

Obesity

As with cats and dogs, obesity is an increasing issue for rabbits. This is why it is important to monitor how much food they are given and to watch both their weight and body condition. This can be done using guides such as the Rabbit Size-O-Meter produced by the UK Pet Food Manufacturers' Association (downloadable from www.pfma.org.uk). The Size-O-Meter gives a series of simple steps helping with a hands-on assessment of the rabbits shape to gauge whether it is a healthy condition or not.

USE OF THE TABLE:

The table has been compiled following a review and interpretation by practising nutritionists and veterinarians of the published literature which is, in the main, for either commercial meat and/or laboratory rabbits.
The values are suggested safe and practical amounts for the design of a complete rabbit food.

The column entitled SUL in some cases consist of levels that should not be exceeded and are indicated by an asterisk, for example Calcium and vitamin D, whereas the others are levels at which no adverse effect has been observed in rabbits, higher levels may still be safe, but no scientific data are available.
Any compound feed for rabbits should clearly state how it is to be fed. Consequently, a complementary compound feed that is to be fed with forage sources, may in itself, not comply with the values in the table. However, when nutrient intake is calculated from the feeding guide, based on the amount of compound and forage and/or additional feedstuffs to be fed in the daily ration, the complete diet should fall within these values. Indeed, for enrichment reasons, as well as adequate dental wear, appropriate amounts of additional forage should be made available at all times. Similarly, free access to drinking water should be emphasised on the pack.

V. NUTRIENT RECOMMENDATIONS

N.B. It is important to note that these nutrient recommendations are for the pet rabbit's total diet. The ration may comprise contributions from various sources including manufactured food, forage, fresh vegetables and treats.

TABLE 1- Nutrient Guidelines for Pet Rabbits – Unit per kg feed at 12% moisture, as fed, assuming 10MJ DE/kg

		Adult Maintenance recommendations		Growth, minimum requirements *			
Nutrient	**UNIT**	**Ranges**		**Ranges**		**SUL**	**Legal maxima**
Protein	g	120 to ≤170		150	180		
Arginine	g	8-9		7	n/d		
Glycine	g	n/d		n/d	n/d		
Histidine	g	n/d		3	n/d		
Isoleucine	g	n/d		6	n/d		
Leucine	g	n/d		11	n/d		
Lysine	g	5 – 8		5**	9		
Methionine + cystine	g	5.4 – 6.5		5.5	n/d		
Phenylalanine + tyrosine	g	n/d		n/d	n/d		
Threonine	g	5.8 – 6.5		6	n/d		
Tryptophan	g	n/d		2	n/d		
Valine	g	n/d		7	n/d		
Carbohydrates		-		-	-		
Starch *	g	≤ 200		n/d	135**	See * below	
ADF	g	170		n/d	n/d		
NDF	g	300 to 450		n/d	n/d		
ADL	g	55 to n/d		n/d	n/d		
((NDF+pectins)-ADF):ADF		n/d to ≤1.3		n/d	n/d		
ADF-ADL	g	110 to n/d		n/d	n/d		
Crude Fibre *	g	140 to 250		140** to 160			
Fat	g	25 to 50		30 to 50			
Minerals	-	-		-			-
Calcium	g	5		5		10	
Phosphorus	g	4		4		9	De Blas & Wiseman 2010 Nutrition of the rabbit
Ca / P ratio		1:5 to 2:1		1:5 to 2:1			
Potassium	g	6		2 to 6		16	
Sodium	g	2		1 to 2		8	
Chloride	g	1.7		1 to 5		4.8	
Magnesium	g	0.3 to 3		0.4 to 0.7		3.5	Plamenac et al 2008, Bio Trace element Res 124 110-117
Trace elements	-	-		-			-
Copper	mg	5 to 20		3 to 6		25	25
Iodine	mg	0.4 to 0.5		n/d		2	10
Iron	mg	30 to 400		100 n/d			1250
Cobalt *	mg	0.25 mg should be supplied when vitamin B12 is limited		0.1 to 1			10
Manganese	mg	8 to 15		20 to 40		75	150
Selenium	mg	0.05 to 0.32		0.1 to n/d		.35	0.5
Zinc	mg	50 to 150		40 to n/d			150
Vitamins	-	-		-			-
Vitamin A	IU	10000 to 12000		6000 to 10000**			
Vitamin E	mg	50 to160		50** to n/d			
Vitamin D	IU	800 to 1000		500 to n/d		2000	2000
Vitamin C	mg	n/d	400	n/d		2000	Potentially a prooxidant if vitamin E levels are not comparable to vitamin C addition (Chen 1989 In vivo **3** 199-209
Vitamin K	mg	1	2	n/d			
B-group *	mg	n/d	n/d	n/d	n/d		

* please refer to Additional Notes on these issues in particular

The values in the table:

- Concerning starch; whilst it is recognised that an upper starch limit may be unnecessary providing that adequate fibre fractions are supplied, the purpose of these recommendations is to provide a safe and efficacious guide to complete diet. An upper starch provides additional safety to the diet for a pet rabbit where, despite appropriate feeding guides, owners may inadvertently overfeed the compound fraction of the daily ration and thus inadvertently provide an imbalance of starch and fibre.
- Further, upper values for fibre fractions are provided as it is recognised that excessive inappropriate fibre fraction intake could reduce the energy supply thus compromise the health and well-being of the rabbit

The values in the ranges are recommended values for typical diets based on the current best knowledge derived from published information including several scientific papers for adult rabbits, and the reference given below for growing rabbits. The limited published information accounts for some apparent discrepancies between the adult and growth values. In the future, some recommended values are likely to change as more information is published.

Growth:

These data come from limited research and we would encourage further work in this area. The majority of the data is taken from Kamphues et al (2009). Additional data comes from De Blas and Wiseman (2010) and Lebas (2000) (see comment marked "**").

Legal maxima:

These list those additives with a maximum legal limit as authorised by the European Union. Maximum permitted levels have been determined by the legislator for several nutrients if added as a nutritional additive (i.e. trace-elements & vitamin D) (legal maximum). They are laid down in the Community Register of Feed Additives pursuant to Regulation 1831/2003/EC of the Parliament and the Council, concerning additives in feedstuffs. The legal maximum levels apply to all life stages (EU Regulation 1831/2003 in conjunction with EU register of feed additives). A legal maximum only applies when the particular trace-element or vitamin is added to the recipe as an additive, but relates to the 'total' amount present in the finished product [amount coming from the additive + amount from feed materials (ingredients)]. If the nutrient comes exclusively from feed materials, the legal maximum does not apply, instead the nutritional maximum, when included in the relevant tables, should be taken into account.

Fibre:

For pet rabbits, whilst it is entirely plausible to manufacture complete feeds with appropriate amounts of dietary carbohydrate ("fibre" and "starch") to meet the nutritional and gastrointestinal physical and physiological needs, the physical nature of the fibre present in the product is the most important factor for dental wear rather than its chemical nature. An appropriate statement as to the need to supply this form of material should appear on all rabbit feed packs along the lines of "For the health and well-being of your rabbit good quality hay should be fed at all times".

Quantification of fibre:

Fibre is essential to the rabbit on a daily basis, to maintain normal gut function, dental wear, and to provide substrate for normal fermentation in the caecum; all these factors are key to nutrient supply, normal health and behaviour in the rabbit.

The term fibre embraces a wide range of plant components and it is important key to quantify the minimum amounts and relative proportions of these that are important to the rabbit.

Fibre comes, in the main, from plant cell walls. Plant cell walls are not uniform and are extremely complex structures. Their type, size and shape depend upon the functionality of that cell wall within the plant. This in turn affects the functionality of the material in the rabbit and how it will be metabolized in the rabbit's gut.

In general, plant cell walls are a series of polysaccharides often associated with glycoproteins, phenolic compounds, acetic acid and in some cells lignin.

A young growing plant cell has a primary cell wall, which contains few cellulosic fibrils and some non-cellulosic components. During ageing, the plant develops a secondary cell wall consisting of mainly cellulose and lignin.

In simple terms, primary cell wall (fermentable, sometimes referred to as digestible, fibre) supports the caecal fermentation needs, whilst secondary cell wall (often termed indigestible fibre) maintains gut motility and function. In absence of structured indigestible fibre, diarrhoea may develop. Plant cell walls (lignin, cellulose and silicate phytoliths) are also important in enhancing salivation and in providing dental abrasion and maintaining normal dental occlusion through extended chewing time, appropriate chewing patterns and force of the chew action.

Fibre measurement is complex and remains incomplete. Further, the terminology is also

often confusing and inconsistent. However, an approach to the fibre needs of rabbits can broadly be based on the following categories:

Total Dietary Fibre (TDF):
Refers to the total cell wall components in a plant. TDF represents all Non-Starch Polysaccharides (NSP), pectic substances, hemicellulose, cellulose and lignin. TDF is the sum of soluble and insoluble fibres (SDF and IDF) that refer to the dietary fibre components that are soluble and insoluble in water, respectively.

Neutral Detergent Fibre (NDF):
Equates to most of the hemicellulose and lignocellulose and all the cellulose.

Acid Detergent Fibre (ADF):
Equates to cellulose and most of the lignin. Consequently NDF minus ADF represents the hemicellulose content of the diet. (AOAC, 2000, method 973.18)

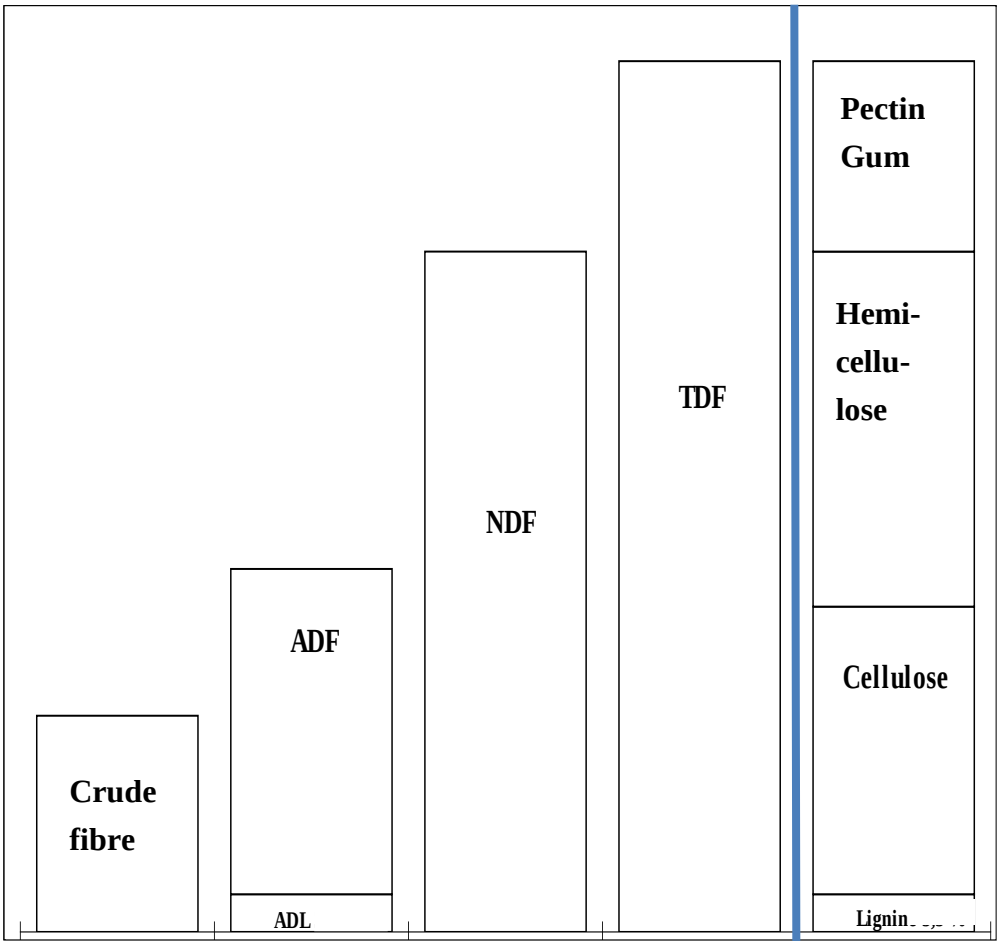
Acid Detergent Lignin (ADL):
Is nearly all lignins.

Other appropriate methods for fibre fractions, currently used in commercial laboratories would be the Fibertec® Tectator, Rellingen, Germany

Crude Fibre (CF):
CF represents 20-90% of the lignin and 30-100% cellulose depending upon the plant ingredient being analysed. Consequently, it could be considered as a poor analytical measure on which to base sound formulation of the complete diet for a rabbit. Meredith A and Prebble J (2012) Dispelling the myths, Fibre. Vet Times August 13th 6-7

Source : Diez M. PhD thesis : Contribution to the study of dietary fibre in dog's diet : effect on faeces characteristics, nutrient digestibility and blood metabolites. Department of Nutrition, Veterinary school, University of Liège, Belgium, 1998. Pp. 26-27.

The non-starch polysaccharide composition of plant material



Note: *The table shows the relative proportions of each of the chemical constituents of plants measured by each method; crude fibre, acid detergent fibre (ADF), acid detergent lignin (ADL, neutral detergent fibre (NDF) and total dietary fibre (TDF).*

Consequently an estimate of pectins can be derived from TDF - NDF

(Hall et al, 1997)

Fibre requirements for pet rabbits:

The rabbit needs a minimum fermentable (digestible) and a minimum non-fermentable (indigestible) fibre component in the complete diet (which may include both a compound food and forage material such as hay). Rather than formulating to crude fibre, it is strongly suggested that the formulation should be based upon values for the various non-starch

polysaccharide (fibre) fractions of the diet. In practical terms values for minima / maxima for NDF[1], ADF[2] and lignin are recommended at the stated DE content of the diet, so as to better reflect the important balance of digestible and indigestible fibre, irrespective of its origin in terms of ingredients in the complete diet. Formulating using appropriate values for these criteria are likely to result in a crude fibre content of the complete diet of 140g/kg when the diet is enriched with other sources of fibre (such as hay) or in the region of ≥ 160g/kg. The corollary of this is that if the NDF, ADF and lignin values are ignored or unavailable to the formulator, a reasonable "safe" value for crude fibre would be in the order of 140g/kg to 160g/kg, irrespective of the ingredient matrix of the complete diet.

Research has indicated that a minimum NDF of 300g/kg total diet, a minimum ADF of 170g/kg total diet would meet the needs of the rabbit at adult maintenance. For growing rabbits an additional constraint of a maximum starch of 135g/kg total diet is recommended, whilst for the adult 200g/kg may be acceptable or even 250g/kg providing the minimum "fibre" values are exceeded (Gidenne and Garcia, 2006).

These fibre components may come from a wide range of ingredients that are incorporated in to the feed either in the form of ground material, as in pelleted or extruded feeds, or as additional loose fibre components. In respect of ground material, evidence indicates that if the indigestible fibre fraction was finely ground (less than 1mm) then the diet behaved as if containing insufficient dietary fibre, inducing adverse caecal patterns and scouring (Pairet et al, 1986 and Bouyssou et al, 1988).

The values for the carbohydrate fractions of the diet should fall within those suggested in the table of these guidelines and should be used in conjunction with the ratio indicated. Such an approach should meet the needs of the rabbit and reduce as far as possible the likelihood of digestive upsets.

A further improvement on quantifying fibre fraction involves the addition of pectin. This follows studies indicating differing fermentation rates of diets with similar NDF values. The effect is considered to be the pectin and other soluble fibre fractions. (Hall *et al*, 1997, and Gidenne and Garcia, 2006)

Minerals:

The rabbit is particularly sensitive to calcium intake and whilst amounts as high as 19-25g/kg total diet have been fed without apparent problems, for the pet rabbit a safer upper limit

[1] Fermentation needs

[2] Indigestible, motility needs

would be 10g/kg.

The cobalt requirement of the rabbit is principally to ensure supply to the hind gut microflora for the synthesis of Vitamin B12. It is however recommended to include sufficient vitamin B12 into the rabbits diet, and thus to remove the need for any additional cobalt, above that supplied from background levels found in the raw materials. The intestinal microflora of the rabbit has been shown to be very efficient at utilising any cobalt present in the diet.
If however B12 is not provided, a cobalt content of 0.25 mg/kg is recommended

Vitamins:

Vitamin C has only been found to be of benefit during periods of stress, otherwise it is assumed that the rabbit is capable of synthesis from glucose. Vitamin K is only suggested as required in the absence of caecotrophy.

The B-group of vitamins is generally regarded as being supplied from synthesis within the hind gut of the rabbit. However in many cases dietary supplements or dietary fortification/enrichment of these vitamins are common place to ensure sufficient vitamin supply in case of insufficient synthesis.

VI. ANALYTICAL METHODS

In order to obtain representative results, samples have to be collected and treated according to the general principles laid down in Commission Regulation 152/2009/EC of 27 January 2009 laying down Community methods of sampling for the official control of feed, as amended, and establishing Community methods of analysis for the official control of feed, as amended (see Table 4).

The analysis of only one sample may not reflect the level declared in the average analysis of the product. To obtain a representative analysis, multiple samples coming from different batches have to be analysed. A composite sample made from multiple samples is also valid. To evaluate the results of a single-sample analysis, minimum tolerances for deviation from the declared values of analytical constituents, as foreseen in ANNEX IV of Council Regulation 767/2009/EC of 13 July 2009 on the placing on the market and use of feed should be permitted, as well as tolerances for analytical latitudes.

Table 2: Non-exhaustive list of analytical methods

NUTRIENT	METHOD REFERENCE(S)
Sampling	EU method O.J. 1981 L 246 p.32 ISO/DIS 6491
Moisture	EU method O.J. 1971 L 279 p.7 ISO /DIS 6496
Protein (crude)	EU method O.J. 1993 L 179 p.8
Arginine	EU method O.J. 1998 L 257 p.14
Histidine	EU method O.J. 1998 L 257 p.14
Isoleucine	EU method O.J. 1998 L 257 p.14
Lysine	EU method O.J. 1998 L 257 p.14
Methionine	EU method O.J. 1998 L 257 p.14
Cystine/Cysteine	EU method O.J. 1998 L 257 p.14
Phenylanaline	EU method O.J. 1998 L 257 p.14
Tyrosine	EU method O.J. 1998 L 257 p.14
Threnonine	EU method O.J. 1998 L 257 p.14
Valine	EU method O.J. 1998 L 257 p.14
Tryptophan	EU method O.J. 2000 L 174 p.32 2nd ISO/CD 13904
Fat (crude)	EU method O.J. 1998 L 257 p.14
Linoleic Acid	VDLUFA method 5.6.2 B.S.I method BS684: section 2.34 : ISO 5509-1997 AOAC 15th ed. (1990) 969.33 & 963.22
Arachidonic Acid	VDLUFA method 5.6.2

	B.S.I method BS684: section 2.34 : ISO 5509-1997 AOAC 15th ed. (1990) 969.33 & 963.22
Fibre (crude)	EU method O.J. 1993 L 344 p.35
Ash (crude)	EU method O.J. 1971 L 155 p.13
Calcium	EU method O.J. 1971 L 155 p.13 ISO/DIS 6869
Phosphorus	EU method O.J. 1971 L 279 p.7 ISO/DIS 6491
Potassium	EU method O.J. 1971 L 155 p.13 ISO/DIS 6869
Sodium	EU method O.J. 1971 L 155 p.13 ISO/DIS 6869
Chloride	EU method O.J. 1971 L 155 p.7 §35 LMBG L06.00-5 AOAC 14th ed. (1984) 3.069-3.070 AOAC 15th ed. (1990) 920.155 & 928.04 AOAC 16th ed. (1998) potentiometric method 50.1.10
Magnesium	EU method O.J. 1973 L 83 p.21 ISO /DIS 6869
Iron	EU method O.J. 1978 L 206 p.43 ISO/DIS 6869
Copper	EU method O.J. 1978 L 206 p.43 ISO/DIS 6869
Manganese	EU method O.J. 1978 L 206 p.43 ISO/DIS 6869
Zinc	EU method O.J. 1998 L 257 p.13 ISO/DIS 6869
Iodine	Ministry of Agriculture, Fisheries and Food (1997). Dietary intake of iodine and fatty acids. Food Surveillance Information Sheet, 127. MAFF
Selenium	The Analyst 1979, 104, 784 VDLUFA, BD III method 11.6 (1993) AOAC 16th ed. (1998) 9.1.01
Vitamin A	EU method O.J. 2000 L 174 p.32 VDLUFA method 13.1.2 2nd ISO/CD 14565
Vitamin D *	VDLUFA method 13.8.1 D3 AOAC 15th ed. (1990) 982.29 BS EN 12821 : 2000
Vitamin E	EU method O.J. 2000 L 174 p.32 2nd ISO/CD 6867 VDLUFA method 13.5.4
Vitamin K	Analytical Proceedings, June 1993, Vol. 30, 266-267 (Vit. K3)

	J. of Chrom. 472 (1989) 371-379 (Vit. K1) BS EN 14148: 2003 (Vit. K1)
Thiamine	AOAC Int. **76,** (1993) 1156-1160 and 1276-1280 AOAC Int. **77** (1994) 681-686 The Analyst, 2000, No. 125, pp 353-360 EN 14122 (2003)
Riboflavin	AOAC Int. **76** (1993) 1156-1160 and 1276-1280 AOAC Int. **77** (1994) 681-686 AOAC 16th ed. (1998) M 940.33 The Analyst, 2000, No. 125, pp 353-360 EN 14152 (2003)
Pantothenic Acid	AOAC 945.74 /42.2.05 (1990) USP XXIII, 1995, M 91
Niacin	AOAC 944.13 /45.2.04 (1990) USP XXIII, 1995, M 441
Vitamin B6 (Pyridoxine)	AOAC 16th ed. (1998) M 985.32 EN 14663: 2005
Folic Acid	AOAC 16th ed. (1998) M 944.12 Biacore AB: Folic Acid Handbook; BR 1005-19
Biotin	USP XXI, 1986, M 88 Biacore AB: Biotin Kit Handbook; BR 1005-18
Vitamin B12	USP XXIII, 1995, M171 AOAC 952.20 Biacore AB: Vitamin B12 Handbook; BR 1004-15
Choline	AOAC Int. Vol 82, No. 5 1999 pp 1156-1162 EG-Draft 15.706/1/VI/68-D/bn
Taurine	AOAC Int. Vol. 82 No. 4, 2000 pp 784-788
Total dietary fibre (TDF)	AOAC Official Method 985.29 or 45.4.07 for Total Dietary Fibre in Food and Food Products
Insoluble fibre (IF)	AOAC Method 991.42 or 32.1.16 for the Insoluble Dietary Fibre in Food and Food Products
Soluble fibre (SF)	AOAC Official Method 993.19 or 45.4.08 for Soluble Dietary Fibre in Food and Food Products
Acid detergent fibre (ADF)	AOAC 937.18
Neutral detergent fibre (NDF)	AOAC 2002.04

Vitamin D analysis of pet foods containing levels which are approaching the minimum recommendation, say between 500 and 1000 IU/kg DM is difficult and unreliable. The detection limit for HPLC methods is approximately 3000 to 5000 IU/kg. Analysis is not required if supplementation is practised and it is unlikely that un-supplemented products with adequate levels of vitamins A and E will be deficient in vitamin D.

ANNEX I – SAFE PRODUCTION OF PET RABBIT FOOD

These Guidelines are written for pet rabbits. However, manufacturers should be aware that unlike most other domestic pets, rabbits are also reared as food animals.

Pet rabbit feed producers and industry in general considers that farmed rabbit and pet rabbit feeding follow two entire different concepts: Pet rabbits are fed for a long and healthy life and not for rapid growth for meat production.

The safe production of pet food for rabbits follows the same requirements as for all pet foods. These requirements are discussed fully in the separate **FEDIAF Guide to Good Practice for the Manufacture of Safe Pet Foods**.

ANNEX II – LABELLING OF PET RABBIT FOODS

The labelling of rabbit feed must take place according to the rules of EU Regulation 767/2009 on the Marketing and Use of Feed:

Feeding instructions

The on-pack feeding guidelines for pet rabbit food are crucial. Owners should be advised that the daily diet should include forage (at least 0.5 of the daily feed dry matter intake), suitable fresh vegetables and fresh water in addition to prepared feed. Over consumption can lead to obesity and guidance to owners (via a variety of media including websites, help lines etc.) can indicate the health implications for the animal.

Composition

EU Regulation 767/2009 has different requirement on the labelling of the composition depending if the target animal is a food-producing animal or a pet animal:

Food-producing animals: Feed materials have to be listed by their specific name in descending order by weight.

Pet animals: The composition can either be indicated by listing the feed materials in descending order by weight, or by using categories of feed materials laid down in directive 82/475.

For detailed information on all other aspects of product labelling, see the **FEDIAF Code of Good Labelling Practice for Pet Food**.

ANNEX III – DIETARY ENRICHMENT

Rabbits lacking dietary enrichment may exhibit undesirable activities (Morton et al, 1993) consistent with stereotypic behaviour (Odberg 1978). This is regarded as an indicator of poor welfare, boredom, deprivation and frustration (Mason 2006). Repetitive oral activities may represent frustrated foraging in rabbits with limited access to high fibre forages. Barren or poorly enriched environments can also lead to other undesirable behaviours (Gunn 1994, Jackson 1991, Stauffacher 1992 and Wallace 1990). Allowing activities such as chewing and foraging has been shown to have a positive effect on behaviour (Berthelsen 1999), with the provision of hay proving to be the most effective in reducing abnormal behaviour (Lidfors 1997). Providing a block of wood for gnawing can also be effective, provided it is a soft wood such as willow or horse chestnut.

A rabbit should be provided with ample opportunity to chew and forage, through the provision of quantities of high fibre forage (hay, dried grasses) and supplementary snacks or treats high in indigestible fibre (gnaw sticks or similar). In addition it is important for welfare to design a diet that encourages increased time chewing in order to increase dental wear.

Dietary enrichment is thus important for a healthy rabbit.

ANNEX IV – FEEDING ISSUES

Selective Feeding

Rabbits as foraging animals have highly developed senses of taste and smell to assist in selecting the correct dietary components in their wild environment. When kept as pets, rabbits may exhibit selective feeding of mixed diets (Harcourt-Brown, 1996) (i.e. eating certain components and avoiding others), potentially leading to ingestion of a diet low in essential nutrients. Pet rabbits offered mixed diets were shown to favour components high in starch and low in calcium and therefore may be at risk of poor bone and tooth quality if permitted to feed this way (Harcourt-Brown, 1996). In addition, the high starch components are lower in fibre such that uncontrolled selective feeding or a diet lacking supplementary fibre, such as hay, can lead to poor tooth quality, insufficient dental wear and digestive conditions.

Pet owners may not be aware of the occurrence of selective feeding as food components may be scattered around the animal's environment, mixed with bedding. Where companies make mixed diets, they can optimise such products by ensuring the recipe is high in fibre ingredients, has a suitable calcium content, is well balanced for palatability of components and that clear instructions on correct feeding (not feeding more until the previous portion is finished) are on pack, so as to reduce or eliminate selective feeding (Cheeke 1994).

ANNEX V – FEED MATERIALS

Excerpts from COMMISSION REGULATION (EU) No 68/2013 creating the Catalogue of feed materials
(only those feed materials of relevance for rabbits were taken from the Catalogue; the list is indicative and manufacturers shall apply due diligence as to the safety of the feed materials)

Non-exclusive list of the main feed materials

1. Cereal grains and products derived thereof

Number	Name	Description
1.1.1	**Barley**	Grains of *Hordeum vulgare* L.
1.1.2	**Barley, puffed**	Product obtained from milled or broken barley by means of a treatment in humid, warm conditions and under pressure.
1.1.3	**Barley, roasted**	Product of barley roasting process which is partially roasted with low colour.
1.1.4	**Barley flakes**	Product obtained by steaming or infra red micronizing and rolling dehusked barley. It may contain a small proportion of barley husks.
1.1.5	**Barley fibre**	Product of barley starch manufacture. It consists of particles of endosperm and principally of fibre.
1.1.6	**Barley hulls**	Product of ethanol-starch manufacture after dry milling, screening and dehulling of barley grains.
1.1.7	**Barley middlings**	Product obtained during the processing of screened, dehusked barley into pearl barley, semolina or flour. It consists principally of particles of endosperm with fine fragments of the outer skins and some grain screenings.
1.1.8	**Barley protein**	Product from barley obtained after starch and bran separation. It consists principally of protein.
1.1.9	**Barley protein feed**	Product from barley obtained after starch separation. It consists principally of protein and particles of endosperm.
1.1.10	**Barley solubles**	Product from barley obtained after wet protein and starch extraction.
1.1.11	**Barley bran**	Product of flour manufacture, obtained from screened grains of dehusked barley. It consists principally of fragments of the outer skins and of particles of grain from which the greater part of the endosperm has been removed.
1.1.12	**Liquid barley starch**	Secondary starch fraction from the production of starch from barley.
1.1.13	**Malting barley screenings**	Product from mechanical screening (size fractionation) consisting of undersized barley kernels and fractions of barley kernels separated before the malting process.
1.1.14	**Malting barley and malt fines**	Product consisting of fractions of barley kernels and malt separated during the production of malt.
1.1.15	**Malting barley husks**	Product from malting barley cleaning consisting of fractions of husk and fines.
1.1.16	**Barley distillers solids, wet**	Product of ethanol manufacture from barley. It contains solid feed fraction from distillation.
1.1.17	**Barley distillers solubles, wet**	Product of ethanol manufacture from barley. It contains soluble feed fraction from distillation.
1.1.18	**Malt**	Product from germinated cereals, dried, milled and/or extracted.
1.1.19	**Malt rootlets**	Product from malting cereals germination and malt cleaning consisting of rootlets, cereal fines, husks and small broken malted cereal grains. It may be milled.
1.2.1	**Maize**	Grains of *Zea mays* L. *ssp. mays*.
1.2.2	**Maize flakes**	Product obtained by steaming or infra red micronizing and rolling dehusked maize. It may contain a small proportion of maize husks.
1.2.3	**Maize middlings**	Product of the manufacture of flour or semolina from maize. It consists principally of fragments of the outer skins and of particles of grain from which less of the endosperm has been removed than in maize bran. It may contain some maize germ fragments.
1.2.4	**Maize bran**	Product of the manufacture of flour or semolina from maize. It consists principally of outer skins and some maize germ fragments, with some endosperm particles.
1.2.5	**Maize cobs**	Central core of a maize ear. It comprises unseparated rachis, grain and leaves.
1.2.6	**Maize screenings**	Fraction of maize kernels separated by the screening process at product intake.
1.2.7	**Maize fibre**	Product of the manufacture of maize starch. It consists principally of fibre.
1.2.8	**Maize gluten**	Product of the manufacture of maize starch. It consists principally of gluten obtained during separation of starch.
1.2.9	**Maize gluten feed**	Product obtained during the manufacture of maize starch. It is composed of bran and maize solubles. The product may also include broken maize and residues from the oil extraction of maize germs. Other products derived from starch and from the refining or fermentation of starch products may be added.
1.2.10	**Maize germ**	Product of the manufacture of semolina, flour or starch from maize. It consists predominately of maize germ, outer skins and parts of the endosperm.
1.2.11	**Maize germ expeller**	Product of oil manufacture obtained by pressing of processed maize germ to which parts of the endosperm and testa may still adhere.

1.2.12	**Maize germ meal**	Product of oil manufacture, obtained by extraction of processed maize germ.
1.2.13	**Crude maize germ oil**	Product obtained from maize germ.
1.2.14	**Maize, puffed**	Product obtained from milled or broken maize by means of a treatment in humid, warm conditions and under pressure.
1.2.15	**Maize steep liquor**	Concentrated liquid fraction from the steeping process of corn.
1.2.16	**Sweet corn silage**	By-product of the sweet-corn processing industry, composed of centre cobs, husks, base of the kernels, chopped and drained or pressed. Generated by chopping the sweet-corn cobs, husks and leaves, with presence of sweet-corn kernels.
1.2.17	**Crushed degerminated (degermed) Maize**	Product obtained by degermination of crushed maize. It consists principally of endosperm fragments and may contain some maize germ and outer skin particles.
1.3.1	**Millet**	Grains of *Panicum miliaceum* L.
1.4.1	**Oats**	Grains of *Avena sativa* L. and other cultivars of oats.
1.4.2	**Dehulled oats**	Dehulled grains of oats. It may be steam treated.
1.4.3	**Oat flakes**	Product obtained by steaming or infra red micronizing and rolling dehusked oats. It may contain a small proportion of oat husks.
1.4.4	**Oat middlings**	Product obtained during the processing of screened, dehusked oats into oat groats and flour. It consists principally of oat bran and some endosperm.
1.4.5	**Oat bran**	Product of flour manufacture, obtained from screened grains of dehusked oat. It consists principally of fragments of the outer skins and of particles of grain from which the greater part of the endosperm has been removed.
1.4.6	**Oat hulls**	Product obtained during dehulling of oat grains.
1.4.7	**Oat, puffed**	Product obtained from milled or broken oat by means of a treatment in humid, warm conditions and under pressure.
1.4.8	**Oat groats**	Cleaned oats with the hull removed.
1.4.9	**Oat flour**	Product obtained by milling of oat grains.
1.4.10	**Fodder oat flour**	Oats product with high content in starch, after decortication.
1.4.11	**Oat feed**	Product obtained during the processing of screened, dehusked oats into oat groats and flour. It consists principally of oat bran and some endosperm.
1.5.1	**Quinoa seed, extracted**	Cleaned whole seed of the quinoa plant (*Chenopodium quinoa* Willd.) from which the saponin contained in the seeds outer layer has been removed.
1.6.1	**Broken rice**	Part of rice kernel of *Oryza Sativa L* with a length less than three-quarters of a whole kernel. The rice may have been parboiled.
1.6.2	**Milled rice**	Husked rice from which almost all the bran and embryo have been removed during rice milling. The rice may have been parboiled.
1.6.3	**Pre-gelatinized rice**	Product obtained from milled or broken rice by pregelatinisation..
1.6.4	**Extruded rice**	Product obtained by extruding rice flour.
1.6.5	**Rice flakes**	Product obtained by flaking pregelatinized rice kernels or broken kernels.
1.6.6	**Husked rice**	Paddy (Oryza Sativa L.) from which the husk only has been removed. It may be parboiled. The processes of husking and handling may result in some loss of bran.
1.6.7	**Ground fodder rice**	Product obtained by grinding fodder rice, consisting either of green, chalky or unripe grains, sifted out during the milling of husked rice, or of normal husked grains which are yellow or spotted.
1.6.8	**Rice flour**	Product obtained by grinding milled rice. The rice may have been parboiled.
1.6.9	**Husked rice, flour**	Product obtained by grinding husked rice. The rice may have been parboiled.
1.6.10	**Rice bran**	Product obtained during rice milling, mainly consisting of the outer layers of the kernel (pericarp, seed coat, nucleus, aleurone) with part of the germ. The rice may have been parboiled or extruded.
1.6.11	**Rice bran with calcium carbonate**	Product obtained during rice milling, mainly consisting of the outer layers of the kernel (pericarp, seed coat, nucleus, aleurone) with part of the germ. It may contain up to 23% of calcium carbonate used as processing aid. The rice may have been parboiled.
1.6.12	**Defatted rice bran**	Rice bran resulting from oil extraction.
1.6.13	**Rice bran oil**	Oil extracted from stabilized rice bran.
1.6.14	**Rice middlings**	Product of rice flour and starch production, obtained by dry or wet milling and sieving. It consists principally of starch, protein, fat and fibre. The rice may have been parboiled. May contain up to 0.25% sodium and up to 0.25% sulphate.
1.6.15	**Rice middlings with calcium carbonate**	Product obtained during rice milling, mainly consisting of particles of aleurone layer and endosperm, It may contain up 23% of calcium carbonate used as processing aid. The rice may have been parboiled.
1.6.17	**Rice germ**	Product obtained during rice milling, mainly consisting of the embryo.
1.6.18	**Rice germ expeller**	Product remaining after rice germ has been crushed to expel the oil.
1.6.20	**Rice protein**	Product of rice starch production, obtained by wet milling sieving, separation, concentration and drying.
1.6.21	**Liquid rice feed**	Concentrated liquid product of wet milling and sieving rice.
1.6.22	**Rice, puffed**	Product obtained by expanding rice kernels or broken kernels.
1.6.23	**Rice, fermented**	Product obtained by fermentation of rice.
1.6.24	**Malformed rice, milled /Chalky rice, milled**	Product obtained during rice milling, mainly consisting of malformed kernel and/or chalky kernel and/or damaged kernel, whole or broken. It may be parboiled.
1.6.25	**Immature rice, milled**	Product obtained during rice milling, mainly consisting of immature and/or chalky kernel.
1.7.1	**Rye**	Grains of *Secale cereale* L.
1.7.2	**Rye middlings**	Product of flour manufacture, obtained from screened rye. It consists principally of

		particles of endosperm, with fine fragments of the outer skins and some miscellaneous parts of the grain.
1.7.3	**Rye feed**	Product of flour manufacture, obtained from screened rye. It consists principally of fragments of the outer skins, and of particles of grain from which less of the endosperm has been removed than in rye bran.
1.7.4	**Rye bran**	Product of flour manufacture, obtained from screened rye. It consists principally of fragments of the outer skins, and of particles of grain from which most of the endosperm has been removed.
1.8.1	**Sorghum; [Milo]**	Grains/seeds of *Sorghum bicolor* (L.) Moench
1.8.2	**Sorghum white**	Grains of white Sorghum
1.8.3	**Sorghum gluten feed**	Dried product obtained during the separation of sorghum starch. It consists principally of bran and a small quantity of gluten. The product may also include dried residues of maceration water and germs could be added.
1.9.1	**Spelt**	Grains of spelt *Triticum spelta* L., *Triticum dicoccum* Schrank, *Triticum monococcum*.
1.9.2	**Spelt bran**	Product of the manufacture of spelt flour. It consists principally of outer skins and some spelt germ fragments, with some endosperm particles.
1.9.3	**Spelt hulls**	Product obtained during dehulling of spelt grains.
1.9.4	**Spelt middlings**	Product obtained during the processing of screened, dehulled spelt into spelt flour. It consists principally of particles of endosperm with fine fragments of the outer skins and some grain screenings.
1.10.1	**Triticale**	Grains of *Triticum X Secale cereale* L. Hybrid.
1.11.1	**Wheat**	Grains of *Triticum aestivum* L., *Triticum durum* Desf. and other cultivars of wheat.
1.11.2	**Wheat rootlets**	Product from malting wheat germination and malt cleaning consisting of rootlets, cereal fines, husks and small broken malted wheat grains.
1.11.3	**Wheat, pre-gelatinised**	Product obtained from milled or broken wheat by means of a treatment in humid, warm conditions and under pressure.
1.11.4	**Wheat middlings**	Product of flour manufacture obtained from screened grains of wheat or dehusked spelt. It consists principally of particles of endosperm with fine fragments of the outer skins and some grain screenings.
1.11.5	**Wheat flakes**	Product obtained by steaming or infra red micronizing and rolling dehusked wheat. It may contain a small proportion of wheat husks.
1.11.6	**Wheat feed**	Product of flour or malting manufacture obtained from screened grains of wheat or dehusked spelt. It consists principally of fragments of the outer skins and of particles of grain from which less of the endosperm has been removed than in wheat bran.
1.11.7	**Wheat bran**	Product of flour or malting manufacture obtained from screened grains of wheat or dehusked spelt. It consists principally of fragments of the outer skins and of particles of grain from which the greater part of the endosperm has been removed.
1.11.8	**Malted fermented wheat particles**	Product obtained by a process combining malting and fermentation of wheat and wheat bran. The product is then dried and ground.
1.11.10	**Wheat fibre**	Fibre extracted from wheat processing. It consists principally of fibre.
1.11.11	**Wheat germ**	Product of flour milling consisting essentially of wheat germ, rolled or otherwise, to which fragments of endosperm and outer skin may still adhere.
1.11.12	**Wheat germ, fermented**	Product of fermentation of wheat germ, with inactivated micro-organisms.
1.11.13	**Wheat germ expeller**	Product of oil manufacture, obtained by pressing of wheat germ (*Triticum aestivum* L., *Triticum durum* Desf. and other cultivars of wheat and dehusked spelt (*Triticum spelta* L., *Triticum dicoccum* Schrank, *Triticum monococcum* L.)) to which parts of the endosperm and testa may still adhere.
1.11.15	**Wheat protein**	Wheat protein extracted during starch or ethanol production, maybe partially hydrolysed
1.11.16	**Wheat gluten feed**	Product of the manufacture of wheat starch and gluten. It consists of bran, from which the germ may have been partially removed. Wheat solubles, broken wheat and other products derived from starch and from the refining or fermentation of starch products may be added.
1.11.18	**Vital wheat gluten**	Wheat protein characterized by a high viscoelasticity as hydrated, with minimum 80% protein (Nx6.25) and maximum 2% ash on dry substance.
1.11.19	**Liquid wheat starch**	Product obtained from the production of starch/glucose and gluten from wheat.
1.11.20	**Wheat starch containing protein, partially de-sugared**	Product obtained during the production of wheat starch mainly comprising partially sugared starch, the soluble proteins and other soluble parts of the endosperm.
1.11.21	**Wheat solubles**	Product of wheat obtained after wet protein and starch extraction. May be hydrolysed.
1.11.22	**Wheat yeast concentrate**	Wet by-product that is released after the fermentation of wheat starch for alcohol production.
1.11.23	**Malting wheat screenings**	Product from mechanical screening (size fractionation) consisting of undersized wheat kernels and fractions of wheat kernels separated before the malting process.
1.11.24	**Malting wheat and malt fines**	Product consisting of fractions of wheat kernels and malt separated during the production of malt.
1.11.25	**Malting wheat husks**	Product from malting wheat cleaning consisting of fractions of husk and fines.
1.12.2	**Grain flour**	Flour from milling grains.
1.12.3	**Grain protein concentrate**	Concentrate and dried product obtained from grain after starch removing through yeast fermentation.
1.12.4	**Cereal grains screenings**	Products from mechanical screening (size fractionation) consisting of small grains and fractions of grain kernels, which may be germinated, separated before further processing of the grain. The products contain more crude fibre (e.g. hulls) than the unfractionated cereals

1.12.5	**Grain germ**	Product of flour milling and the manufacture of starch consisting principally of grain germ, rolled or otherwise, to which fragments of endosperm and outer skin may still adhere.
1.12.6	**Grain spent wash syrup**Error! Bookmark not defined.	Product of grain obtained through the evaporation of the concentrate of the spent wash from the fermentation and distillation of grain used in the production of grain spirit.
1.12.7	**Moist distillers' grains**	Moist product produced as the solid fraction by centrifuging and/or filtration of the spent wash from fermented and distilled grains used in the production of grain spirit.
1.12.8	**Concentrated Distillers Solubles**	Moist product from production of alcohol by fermentation and distilling a mash of wheat and sugar syrup after previous separation of bran and gluten. They may contain dead cells and/or parts of the fermentation microorganisms.
1.12.9	**Distillers' grains and solubles**	Product obtained when producing alcohol by fermentation and distilling grain mash of cereals and/ or other starchy and sugar containing products. They may contain dead cells and/or parts of the fermentation microorganisms. May contain 2% sulphate.
1.12.10	**Distillers' dried grains**	Product of alcohol distilling obtained by drying solid residues of fermented grains.
1.12.11	**Distillers' dark grains; [Distillers' dried grains and solubles]**	Product of alcohol distilling obtained by drying solid residues of fermented grains to which pot ale syrup or evaporated spent wash has been added.
1.12.12	**Brewers' grains**	Product of brewing composed by residues of malted and unmalted cereals and other starchy products, which may contain hop materials. Typically marketed in a moist condition but may also be sold in a dried form. May contain up to 0.3% dimethyl polysiloxane, may contain up to 1.5% enzymes, may contain up to 1.8% bentonite.
1.12.13	**Draff**	Solid product of cereal whisky production. It consists of the residues from hot water extraction of malted cereal. Typically marketed in the moist form after the extract has been removed by gravity.
1.12.14	**Mash Filter Grains**	Solid product obtained through the production of beer, malt extract and whisky spirit. It consists of the residues of hot water extraction of ground malt and possibly other sugar or starch-rich adjuncts. Typically marketed in the moist form after the extract has been removed by pressing.
1.12.15	**Pot ale**	The product remaining in the still from the first (wash) distillation of a malt distillery.
1.12.16	**Pot ale syrup**	Product from the first (wash) distillation of a malt distillery produced by evaporating the pot ale remaining in the still.

2. Oil seeds, oil fruits, and products derived thereof

Number	Name	Description
2.1.1	**Babassu expeller**	Product of oil manufacture, obtained by pressing Babassu palm nuts *Orbignya* varieties.
2.2.1	**Camelina seed**	Seeds of *Camelina sativa* L. Crantz.
2.2.2	**Camelina, expeller**	Product of oil manufacture, obtained by pressing of seeds of Camelina.
2.2.3	**Camelina meal**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of Camelina seed expeller.
2.3.1	**Cocoa husks**	Teguments of the dried and roasted beans of *Theobroma cacao* L.
2.3.2	**Cocoa hulls**	Product obtained by processing of cocoa beans.
2.3.3	**Cocoa bean meal, partially decorticated**	Product of oil manufacture, obtained by extraction of dried and roasted cocoa beans Theobroma cacao L. from which part of the husks has been removed
2.4.1	**Copra expeller**	Product of oil manufacture, obtained by pressing the dried kernel (endosperm) and outer husk (tegument) of the seed of the coconut palm *Cocos nucifera* L.
2.4.2	**Copra, hydrolysed expeller**	Product of oil manufacture, obtained by pressing and enzymatic hydrolisation of the dried kernel (endosperm) and outer husk (tegument) of the seed of the coconut palm *Cocos nucifera* L.
2.4.3	**Copra meal**	Product of oil manufacture, obtained by extraction of the dried kernel (endosperm) and outer husk (tegument) of the seed of the coconut palm.
2.5.1	**Cotton seed**	Seeds of *Gossypium* spp. from which the fibres have been removed.
2.5.2	**Cotton seed meal, partially decorticated**	Product of oil manufacture, obtained by extraction of seeds of cotton from which the fibres and part of the husks have been removed. (Maximum crude fibre 22.5% in the dry matter).
2.5.3	**Cotton seed expeller**	Product of oil manufacture, obtained by pressing of seeds of cotton from which the fibres have been removed.
2.6.1	**Groundnut expeller, partially decorticated**	Product of oil manufacture, obtained by pressing of partially decorticated groundnuts *Arachis hypogaea* L. and other species of *Arachis*. (Maximum crude fibre content 16% in the dry matter)
2.6.2	**Groundnut meal, partially decorticated**	Product of oil manufacture, obtained by extraction of partially decorticated groundnut expeller. (Maximum crude fibre content 16% in the dry matter)
2.6.3	**Groundnut expeller, decorticated**	Product of oil manufacture, obtained by pressing of decorticated groundnuts.
2.6.4	**Groundnut meal, decorticated**	Product of oil manufacture, obtained by extraction of decorticated groundnut expeller.
2.7.1	**Kapok expeller**	Product of oil manufacture obtained by pressing of Kapok seeds (*Ceiba pentadra* L. Gaertn.).
2.8.1	**Linseed**	Seeds of linseed *Linum usitatissimum* L. (Minimum botanical purity 93%) as whole, flattened or ground linseed.
2.8.2	**Linseed expeller**	Product of oil manufacture, obtained by pressing of linseed. (Minimum botanical purity

		93%).
2.8.3	**Linseed meal**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of linseed expeller.
2.8.4	**Linseed expeller feed**	Product of oil manufacture, obtained by pressing of linseed. (Minimum botanical purity 93%). May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.8.5	**Linseed meal feed**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of linseed expeller. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.9.2	**Mustard seed meal**	Product obtained by the extraction of volatile mustard oil from mustard seeds
2.10.1	**Niger seed**	Seeds of the niger plant *Guizotia abyssinica* (L. F.) Cass.
2.10.2	**Niger seed expeller**	Product of oil manufacture, obtained by pressing of seeds of the niger plant (Ash insoluble in HCl: maximum 3,4%)
2.11.1	**Olive pulp**	Product of oil manufacture, obtained by extraction of pressed olives *Olea europea* L. separated as far as possible from parts of the kernel.
2.11.2	**Defatted olive meal feed**	Product of olive oil manufacture, obtained by extraction and appropriate heat treatment of olive pulp expeller separated as far as possible from parts of the kernel. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.11.3	**Defatted olive meal**	Product of olive oil manufacture, obtained by extraction and appropriate heat treatment of olive pulp expeller separated as far as possible from parts of the kernel.
2.12.1	**Palm kernel expeller**	Product of oil manufacture, obtained by pressing of palm kernels *Elaeis guineensis* Jacq., *Corozo oleifera* (HBK) L. H. Bailey (*Elaeis melanococca auct*.) from which as much as possible of the hard shell has been removed.
2.12.2	**Palm kernel meal**	Product of oil manufacture, obtained by extraction of palm kernels from which as much as possible of the hard shell has been removed.
2.13.1	**Pumpkin and squash seed**	Seeds of *Cucurbita pepo* L. and plants of the genus *Cucurbita*.
2.13.2	**Pumpkin and squash seed, expeller**	Product of oil manufacture, obtained by pressing of seeds of *Cucurbita pepo* and plants of the genus Cucurbita.
2.14.1	**Rape seed**	Seeds of rape *Brassica napus* L. ssp. *oleifera* (Metzg.) Sinsk., of Indian sarson *Brassica napus* L. *var. glauca* (Roxb.) O.E. Schulz and of rape *Brassica rapa* ssp. *oleifera* (Metzg.) Sinsk. Minimum botanical purity 94%.
2.14.2	**Rape seed, expeller**	Product of oil manufacture, obtained by pressing of seeds of rape.
2.14.3	**Rape seed meal**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of rape seed expeller.
2.14.4	**Rape seed, extruded**	Product obtained from whole rape by means of a treatment in humid, warm conditions and under pressure increasing starch gelatinisation.
2.14.5	**Rape seed protein concentrate**	Product of oil manufacture, obtained by separation of protein fraction of rapeseed expeller or rapeseed.
2.14.2	**Rape seed expeller feed**	Product of oil manufacture, obtained by pressing of seeds of rape. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.14.3	**Rape seed meal feed**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of rape seed expeller. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.15.1	**Safflower seed**	Seeds of the safflower *Carthamus tinctorius* L.
2.15.2	**Safflower seed meal, partially decorticated**	Product of oil manufacture, obtained by extraction of partially decorticated seeds of safflower.
2.15.3	**Safflower hulls**	Product obtained during dehulling of safflower seeds.
2.16.1	**Sesame seed**	Seeds of *Sesamum indicum* L.
2.17.1	**Sesame seed, partially dehulled**	Product of oil manufacture, obtained by removing part of the husks.
2.17.2	**Sesame hulls**	Product obtained during dehulling of sesame seeds.
2.17.3	**Sesame seed expeller**	Product of oil manufacture, obtained by pressing of seeds of the sesame plant (Ash insoluble in HCl: maximum 5%)
2.18.1	**Toasted soya (beans)**	Soya beans (*Glycine max*. L. Merr.) subjected to an appropriate heat treatment. (Urease activity maximum 0.4 mg N/g × min.).
2.18.2	**Soya (bean) expeller**	Product of oil manufacture, obtained by pressing the seed of soya
2.18.3	**Soya (bean) meal**	Product of oil manufacture, obtained from soya beans after extraction and appropriate heat treatment. (Urease activity maximum 0.4 mg N/g × min.).
2.18.4	**Soya (bean) meal, dehulled**	Product of oil manufacture, obtained from dehulled soya beans after extraction and appropriate heat treatment. (Urease activity maximum 0.5 mg N/g × min.).
2.18.5	**Soya (bean) hulls**	Product obtained during dehulling of soya beans.
2.18.6	**Soya beans, extruded**	Product obtained from soya beans by means of a treatment in humid, warm conditions and under pressure increasing starch gelatinisation.
2.18.7	**Soya (bean) protein concentrate**	Product obtained from dehulled, fat extracted soya beans, after fermentation or a second extraction to reduce the level of nitrogen-free extract.

2.18.8	**Soya bean pulp ; [Soya bean paste]**	Product obtained during extraction of soya beans for food preparation.
2.18.9	**Soya bean molasses**	Product obtained during the processing of soya bean.
2.18.10	**By-product from soybean preparation**	Products obtained when processing soybeans to obtain soybean food preparations.
2.18.11	**Soya (beans)**	Soya beans (*Glycine max*. L. Merr.)
2.18.12	**Soybean, flakes**	Product obtained by steaming or infra red micronizing and rolling dehulled soya beans. (Urease activity maximum 0.4 mg N/g × min.).
2.18.13	**Soya (bean) meal feed**	Product of oil manufacture, obtained from soya beans after extraction and appropriate heat treatment. (Urease activity maximum 0.4 mg N/g × min.). May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.18.14	**Soya (bean) meal feed, dehulled**	Product of oil manufacture, obtained from dehulled soya beans after extraction and appropriate heat treatment. (Urease activity maximum 0.5 mg N/g × min.). May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.19.1	**Sunflower seed**	Seeds of the sunflower *Helianthus annuus* L.
2.19.2	**Sunflower seed expeller**	Product of oil manufacture, obtained by pressing of seeds of the sunflower.
2.19.3	**Sunflower seed meal**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of sunflower seed expeller.
2.19.4	**Sunflower seed meal, dehulled**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of expeller of sunflower seeds from which part or all of the husks has been removed. Maximum crude fibre 27.5% in the dry matter
2.19.5	**Sunflower seed hulls**	Product obtained during dehulling of sunflower seeds.
2.19.6	**Sunflower seed meal feed**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of sunflower seed expeller. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants.
2.19.7	**Sunflower seed meal feed, dehulled**	Product of oil manufacture, obtained by extraction and appropriate heat treatment of expeller of sunflower seeds from which part or all of the husks has been removed. May contain up to 1% used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) and crude lecithins from integrated crushing and refining plants. Maximum crude fibre 27.5% in the dry matter.
2.20.1	**Vegetable oil and fat**	Oil and fat obtained from plants (excluding castor oil from the ricinus plant), it may be degummed, refined and/or hydrogenated
2.21.1	**Crude lecithins**	Product obtained during degumming of crude oil from oilseeds and oil fruits with water. Citric acid, phosphoric acid or sodium hydroxide may be added during degumming of the crude oil.
2.22.1	**Hemp seed**	Controlled hemp seed *Cannabis sativa* L. with a maximum THC content according to EU legislation
2.22.2	**Hemp expeller**	Product of oil manufacture obtained by pressing of hemp seed.
2.22.3	**Hemp oil**	Product of oil manufacture, obtained by pressing of hemp plant and seed.
2.23.1	**Poppy seed**	Seeds of *Papaver somniferum* L.
2.23.2	**Poppy meal**	Product of oil manufacture, obtained by extraction of expeller of poppy seed

3. Legume seeds and products derived thereof

Number	Name	Description
3.1.1	**Beans, toasted**	Seeds of *Phaseolus* spp. or *Vigna* spp. submitted to an appropriate heat treatment.
3.1.2	**Bean protein concentrate**	Product obtained from the separated bean fruit water, when producing starch.
3.2.1	**Carob, dried**	Dried fruits of the carob tree *Ceratonia siliqua* L.
3.2.3	**Carob pods, dried**	Product obtained by crushing the dried fruits (pods) of the carob tree and from which the locust beans have been removed.
3.2.4	**Dried carob pod meal, micronised**	Product obtained by micronisation of the dried fruits of the carob tree from which the locust beans have been removed.
3.2.5	**Carob germ**	Germ of the locust bean of the carob tree.
3.2.6	**Carob germ, expeller**	Product of oil manufacture, obtained by pressing of germ of carob.
3.2.7	**Locust bean (seed)**	Bean of the carob tree.
3.3.1	**Chick peas**	Seeds of *Cicer arietinum* L.
3.4.1	**Ervil**	Seeds of *Ervum ervilia* L.
3.5.1	**Fenugreek seed**	Seed of fenugreek (*Trigonella foenum-graecum*).
3.6.1	**Guar meal**	Product obtained after extraction of the mucilage from seeds of guar bean *Cyamopsis tetragonoloba* (L.) Taub.
3.6.2	**Guar germs meal**	Product of mucilage extraction from the germ of seeds of guar bean.
3.7.1	**Horse beans**	Seeds of *Vicia faba* L. *ssp. faba var. equina Pers. and var. minuta (Alef.)* Mansf.
3.7.2	**Horse bean flakes**	Product obtained by steaming or infra red micronizing and rolling dehusked horse beans.
3.7.3	**Film horse beans; [Faba bean hulls]**	Product obtained during dehulling horse bean seeds, consisting mainly of external envelopes.

3.7.4	**Horse beans, dehulled**	Product obtained during dehulling horse bean seeds, consisting mainly of bean kernels from horse beans.
3.7.5	**Horse bean protein**	Product obtained by grinding and air fractionation of horse beans.
3.8.1	**Lentils**	Seeds of *Lens culinaris* a.o. Medik.
3.8.2	**Lentil hulls**	Product obtained during dehulling process of lentil seeds.
3.9.1	**Sweet lupins**	Seeds of *Lupinus* spp. low in bitter seed content.
3.9.2	**Sweet lupins, dehulled**	Dehulled lupin seeds.
3.9.3	**Film lupins; [lupin hulls]**	Product obtained during dehulling of lupin seeds, consisting mainly of external envelopes.
3.9.4	**Lupin pulp**	Product obtained after extraction of components of lupin.
3.9.5	**Lupin middlings**	Product obtained during the manufacture of lupin flour from lupin. It consists principally of particles of cotyledon, and to a lesser extent, of skins.
3.9.6	**Lupin protein**	Product obtained from the separated lupin fruit water when producing starch, or after grinding and air fractionation.
3.9.7	**Lupin protein meal**	Product of lupin processing to produce a high protein meal.
3.10.1	**Mung beans**	Beans of *Vigna radiata* L.
3.11.1	**Peas**	Seeds of *Pisum* spp.
3.11.2	**Pea bran**	Product obtained during the manufacture of pea meal. It is composed mainly of skins removed during the skinning and cleaning of peas.
3.11.3	**Pea flakes**	Product obtained by steaming or infra red micronizing and rolling dehulled seeds of peas.
3.11.4	**Pea flour**	Product obtained during the grinding of peas.
3.11.5	**Pea hulls**	Product obtained during the manufacture of pea meal from peas. It is mainly composed of skins removed during the skinning and cleaning and, to a lesser extent, of endosperm.
3.11.6	**Peas, dehulled**	Dehulled pea seeds.
3.11.7	**Pea middlings**	Product obtained during the manufacture of pea flour. It consists principally of particles of cotyledon, and to a lesser extent, of skins.
3.11.8	**Pea screenings**	Product from the mechanical screening consisting of fractions of pea kernels separated before further processing.
3.11.9	**Pea protein**	Product obtained from the separated pea fruit water when producing starch, or after grinding and air fractionation, maybe partially hydrolysed.
3.11.10	**Pea pulp**	Product obtained from starch and protein wet extraction from peas. It is mainly composed of internal fibre and starch.
3.11.11	**Pea solubles**	Product obtained from starch and protein wet extraction from peas. It is mainly composed of soluble proteins and oligosaccharides.
3.11.12	**Pea fibre**	Product obtained by extraction after grinding and sieving of the dehulled pea.
3.12.1	**Vetches**	Seeds of *Vicia sativa* L. *var sativa* and other varieties.
3.13.1	**Chickling vetch**	Seeds of *Lathyrus sativus* L. submitted to an appropriate heat treatment.
3.14.1	**Monantha vetch**	Seeds of *Vicia monanthos* Desf.

4. Tubers, roots, and products derived thereof

Number	Name	Description
4.1.1	**Sugar beet**	Root of *Beta vulgaris* L. ssp. *vulgaris* var. *altissima* Doell.
4.1.2	**Sugar beet tops and tails**	Fresh product of the manufacture of sugar consisting mainly of cleaned pieces of sugar beet with or without parts of beet leaves.
4.1.3	**(Beet) sugar; [sucrose]**	Sugar extracted from sugar beets using water.
4.1.4	**(Sugar) beet molasses**	Syrupy product obtained during the manufacture or refining of sugar from sugar beets. May contain up to 0.5% antifoaming agents. May contain up to 0.5% antiscaling agents. May contain up to 2% sulphate. May contain up to 0.25% sulphite.
4.1.5	**(Sugar) beet molasses, partially-desugared and/or debetainized**	Product obtained after further extraction using water of sucrose and/or betaine from sugar beet molasses. May contain up to 2% sulphate. May contain up to 0.25% sulphite.
4.1.6	**Isomaltulose molasses**	Non-crystallised fraction from the manufacture of isomaltulose by enzymatic conversion of sucrose from sugar beets.
4.1.7	**Wet (sugar) beet pulp**	Product of the manufacture of sugar consisting of slices of sugar beet that have had sugar extracted with water. Minimum moisture content: 82%. Sugar content is low and declines towards zero due to (lactic acid) fermentation.
4.1.8	**Pressed (sugar) beet pulp**	Product of the manufacture of sugar consisting of slices of sugar beet that have had sugar extracted with water and have been mechanically pressed. Maximum moisture content: 82%. Sugar content is low and declines towards zero due to (lactic acid) fermentation. May contain up to 1% sulphate.
4.1.9	**Pressed (sugar) beet pulp, molassed**	Product of the manufacture of sugar consisting of slices of sugar beet that have had sugar extracted with water, have been mechanically pressed, and with molasses added. Maximum moisture content: 82%. Sugar content declines due to (lactic acid) fermentation. May contain up to 1% sulphate.
4.1.10	**Dried (sugar) beet pulp**	Product of the manufacture of sugar consisting of slices of sugar beet that have had sugar extracted with water, mechanically pressed and dried. May contain up to 2% sulphate.
4.1.11	**Dried (sugar) beet pulp, molassed**	Product of the manufacture of sugar consisting of slices of sugar beet that have had sugar extracted with water, mechanically pressed, and dried, with molasses added. May contain up to 0.5% antifoaming agents. May contain up to 2% sulphate.

4.1.12	**Sugar syrup**	Product obtained by processing of sugar and/or molasses. May contain up to 0.5% sulphate. May contain up to 0.25% sulphite.
4.1.13	**(Sugar) beet pieces, boiled**	Product of the manufacture of edible syrup from sugar beet, which may be pressed or dried.
4.1.14	**Fructo-oligosaccharides**	Product obtained from sugar from sugar beet through an enzymatic process.
4.2.1	**Beetroot juice**	Juice from pressing of red beet (*Beta vulgaris convar. crassa var. conditiva*) with subsequent concentration and pasteurization, maintaining the typical vegetable-like taste and flavour.
4.3.1	**Carrots**	Root of the yellow or red carrot *Daucus carota* L.
4.3.2	**Carrot peelings, steamed**	Moist product from the carrot processing industry consisting of the peelings removed from the carrot root by steam treatment to which auxiliary flows of gelatinous carrot starch may be added. Maximum moisture content: 97%.
4.3.3	**Carrot scrapings**	Moist product which is released via mechanical separation in the processing of carrots and which mostly consists of dried carrots and carrot remnants. The product may have been subject to heat treatment. Maximum moisture content: 97%.
4.3.4	**Carrot flakes**	Product obtained by flaking roots of the yellow or red carrot, which are subsequently dried.
4.3.5	**Carrot, dried**	Root of the yellow or red carrot regardless of their presentation, which are subsequently dried.
4.3.6	**Carrot feed, dried**	Product constituted of internal pulp and outer skins that are dried.
4.4.1	**Chicory roots**	Roots of *Cichorium intybus* L.
4.4.2	**Chicory tops and tails**	Fresh product from chicory processing. It consists predominantly of cleaned pieces of chicory and parts of leaves.
4.4.3	**Chicory seed**	Seed of *Cichorium intybus* L.
4.4.4	**Pressed chicory pulp**	Product of the manufacture of inulin from roots of *Cichorium intybus* L. consisting of extracted and mechanically pressed slices of chicory. The (soluble) chicory carbohydrates and water have been partly removed. May contain up to 1% sulphate, and may contain up to 0.2% sulphite.
4.4.5	**Dried chicory pulp**	Product of the manufacture of inulin from roots of *Cichorium intybus* L. consisting of extracted and mechanically pressed slices of chicory and subsequent drying. The (soluble) chicory carbohydrates have been partly extracted. May contain up to 2% sulphate, and may contain up to 0.5% sulphite.
4.4.6	**Chicory roots powder**	Product obtained by chopping, drying and grinding of chicory roots. May contain up to 1% of anticaking agents.
4.4.7	**Chicory molasses**	Product of chicory processing, obtained during the production of inulin and oligofructose. Chicory molasses consists of organic plant material and minerals. May contain up to 0.5% antifoaming agents
4.4.8	**Chicory vinasses**	By-product from chicory processing obtained after the separation of inulin and oligofructose and ion exchange eluation. Chicory vinasses consists of organic plant material and minerals. May contain up to 1% antifoaming agents.
4.4.9	**Chicory inulin**	Inulin is a fructan extracted from roots of *Cichorium intybus* L.; raw chicory inulin may contain up to 1% sulphate and may contain up to 0.5% sulphite.
4.4.10	**Oligofructose syrup**	Product obtained by partial hydrolysis of inulin from *Cichorium intybus* L.; raw oligofructose syrup may contain up to 1% sulphate and may contain up to 0.5% sulphite.
4.4.11	**Oligofructose, dried**	Product obtained by partial hydrolysis of inulin from *Cichorium intybus* L. and subsequent drying.
4.5.1	**Garlic, dried**	White to yellow powder of pure, ground garlic, *Allium sativum* L.
4.6.1	**Manioc; [tapioca]; [cassava]**	Roots of *Manihot esculenta* Crantz, regardless of their presentation.
4.6.2	**Manioc, dried**	Roots of Manioc, regardless of their presentation, which are subsequently dried.
4.7.1	**Onion pulp**	Moist product which is released during the processing of onions (genus *Allium*) and consists of both skins and whole onions. If from the production process for onion oil, then it mostly consists of cooked remains of onions.
4.7.2	**Onions, fried**	Skinned and crumbed onion pieces which are then fried.
4.7.3	**Onions solubles**	Dry product which is released during the processing of fresh onions. It is obtained by alcoholic and/or water extraction, the water or alcoholic fraction is separated and spraydried. It consists mainly in carbohydrates.
4.8.1	**Potatoes**	Tubers of *Solanum tuberosum* L.
4.8.2	**Potatoes, peeled**	Potatoes from which the skin is removed using steam treatment.
4.8.3	**Potato peelings, steamed**	Moist product from the potato processing industry consisting of the peelings removed by steam treatment from the potato tuber to which auxiliary flows of gelatinous potato starch may be added. It may be mashed.
4.8.4	**Potato cuttings, raw**	Product released from potatoes during the preparation of potato products for human consumption, which may have been peeled.
4.8.5	**Potato scrapings**	Product which is released via mechanical separation in the processing of potatoes and which mostly consists of dried potatoes and potato remnants. The product may have been subject to heat treatment.
4.8.6	**Potato, mashed**	Blanched or boiled and then mashed potato product.
4.8.7	**Potato flakes**	Product obtained by rotary drying of washed, peeled or unpeeled steamed potatoes.
4.8.8	**Potato pulp**	Product of the manufacture of potato starch consisting of extracted ground potatoes.
4.8.9	**Potato pulp, dried**	Dried product of the manufacture of potato starch consisting of extracted ground potatoes.
4.8.10	**Potato protein**	Product of starch manufacture composed mainly of protein substances obtained after the

		separation of starch.
4.8.11	**Potato protein, hydrolysed**	Protein obtained by a controlled enzymatic hydrolysis of potato proteins.
4.8.12	**Potato protein, fermented**	Product obtained by fermentation of potato protein and subsequent spray drying.
4.8.13	**Potato protein fermented, liquid**	Liquid product obtained by fermentation of potato protein.
4.8.14	**Potato juice, concentrated**	Concentrated product of the manufacture of potato starch, consisting of the remaining substance after the partial removal of fibre, proteins and starch from the whole potato pulp and evaporation of part of the water.
4.8.15	**Potato granules**	Dried potatoes (potatoes after washing, peeling, size reduction – cutting, flaking, etc. and water content removal).
4.9.1	**Sweet potato**	Tubers of *Ipomoea batatas* L. regardless of their presentation.
4.10.1	**Jerusalem artichoke; [Topinambur]**	Tubers of *Helianthus tuberosus* L. regardless of their presentation.

5. Other seeds and fruits, and products derived thereof

Number	Name	Description
5.1.1	**Acorn**	Whole fruits of the pendunculate oak *Quercus robur* L., the sessile oak *Quercus petraea (*Matt.*) Liebl*., the cork oak *of Quercus suber* L., or other species of oak.
5.1.2	**Acorn, dehulled**	Product obtained during dehulling of acorn.
5.2.1	**Almond**	Whole or broken fruit *Prunus dulcis*, with or without hulls.
5.2.2	**Almond Hulls**	Almond hulls obtained from dehusked almond seeds by physical separation from the kernels and ground.
5.2.3	**Almond kernel expeller**	Product of oil manufacture obtained by pressing of almond kernels
5.3.1	**Anise seed**	Seeds of *Pimpinella anisum*.
5.4.1	**Apple pulp, dried; [Apple pomace, dried]**	Product obtained from the production of juice of *Malus domestica* or cider production. It consists principally of internal pulp and outer skins that are dried. It may have been depectinised
5.4.2	**Apple pulp, pressed; [Apple pomace, pressed]**	Moist product obtained from the production of apple juice or cider production. It consists principally of internal pulp and outer skins that are pressed. It may have been depectinised
5.4.3	**Apple molasses**	Product obtained after producing pectin from apple pulp. It may have been depectinised
5.5.1	**Sugar beet seed**	Seeds of sugar beet
5.6.1	**Buckwheat**	Seeds of *Fagopyrum esculentum*
5.6.2	**Buckwheat hulls and bran**	Product obtained during the milling of buckwheat grains.
5.6.3	**Buckwheat middlings**	Product of flour manufacture, obtained from screened buckwheat. It consists principally of particles of endosperm, with fine fragments of the outer and some miscellaneous parts of the grain. It must contain no more than 10% crude fibre.
5.7.1	**Red cabbage seed**	Seeds of *Brassica oleracea* var. *capitata f. Rubra*.
5.8.1	**Canary grass seed**	Seeds of *Phalaris canariensis.*
5.9.1	**Caraway seed**	Seeds from *Carum carvi* L.
5.12.1	**Broken chestnuts**	Product of the production of chestnut flour, consisting mainly of particles of endosperm, with fine fragments of envelopes and a few remnants of chestnut (*Castanea* spp.).
5.13.1	**Citrus pulp**	Product obtained by pressing citrus fruits *Citrus* (L.) spp. or during the production of citrus juice. It may have been depectinised.
5.13.2	**Citrus pulp, dried**	Product obtained by pressing citrus fruits or during the production of citrus juice, which is subsequently dried. It may have been depectinised.
5.14.1	**Red clover seed**	Seeds of *Trifolium pratense* L.
5.14.2	**White clover seed**	Seeds of *Trifolium repens* L.
5.15.1	**Coffee skins**	Product obtained from dehusked seeds of the *Coffea* plant.
5.16.1	**Cornflower seed**	Seeds of *Centaurea cyanus* L.
5.17.1	**Cucumber seed**	Seeds of *Cucumis sativus* L.
5.18.1	**Cypress seed**	Seeds of *Cupressus* L.
5.19.1	**Date fruit**	Fruits of *Phoenix dactylifera* L. It may be dried.
5.19.2	**Date seed**	Whole seeds of the date plant.
5.20.1	**Fennel seed**	Seeds of *Foeniculum vulgare* Mill.
5.21.1	**Fig fruit**	Fruits of *Ficus carica* L. It may be dried.
5.22.1	**Fruit kernels**	Product consisting of the inner, edible seeds of a nut or fruit stone.
5.22.2	**Fruit pulp**	Product obtained during the production of fruit juice and fruit puree. It may have been depectinised.
5.22.3	**Fruit pulp, dried**	Product obtained during the production of fruit juice and fruit puree which is subsequently dried. It may have been depectinised.
5.23.1	**Garden cress**	Seeds from *Lepidium sativum* L.
5.24.1	**Graminaceous seeds**	Seeds from graminoids of the families *Poaceae, Cyperaceae* and *Juncaceae.*
5.25.1	**Grape pips**	Pips from *vitis* L. separated from grape pulp, from which the oil has not been removed.
5.25.2	**Grape pips meal**	Product obtained during the extraction of oil from grape pips.
5.25.3	**Grape pulp [Grape marc]**	Grape pulp dried rapidly after the extraction of alcohol from which as much as possible of the stalks and pips have been removed.
5.25.4	**Grape pips soluble**	Product obtained from grape pips after producing grape juice. It principally contains carbohydrates. It may be concentrated.
5.26.1	**Hazelnut**	Whole or broken fruit of *Corylus* (L.) spp., with or without hulls.
5.26.2	**Hazelnut expeller**	Product of oil manufacture obtained by pressing of hazelnut kernels

5.27.1	**Pectin**	Pectin is obtained by aqueous extraction (of natural strains) of appropriate plant material, usually citrus fruits or apples. No organic precipitant shall be used other than methanol, ethanol and propane-2-ol. May contain up to 1% methanol, ethanol and propane-2-ol singly or in combination, on an anhydrous basis. Pectin consists mainly of the partial methyl esters of polygalacturonic acid and their ammonium, sodium, potassium and calcium salts.
5.28.1	**Perilla seed**	Seeds of *Perilla frutescens* L. and its milling products.
5.29.1	**Pine nut**	Seeds from *Pinus* (L.) spp.
5.30.1	**Pistachio**	Fruit of *Pistacia vera* L.
5.31.1	**Plantago seed**	Seeds of *Plantago* (L.) spp.
5.32.1	**Radish seed**	Seeds of *Raphanus sativus* L.
5.33.1	**Spinach seed**	Seeds of *Spinacia oleracea* L.
5.34.1	**Thistle seed**	Seeds from *Carduus marianus* L.
5.35.1	**Tomato pulp [tomato pomace]**	Product obtained by pressing tomatoes *Solanum lycopersicum* L. during the production of tomato juice. It consists principally of tomato peel and seeds.
5.36.1	**Yarrow seed**	Seeds of *Achillea millefolium* L.
5.37.1	**Apricot kernel expeller**	Product of oil manufacture obtained by pressing of apricot kernels (Prunus armeniaca L.). It may contain hydrocyanic acid
5.38.1	**Black cumin expeller**	Product of oil manufacture obtained by pressing of black cumin seeds (*Bunium persicum L.*)
5.39.1	**Borrage seed expeller**	Product of oil manufacture obtained by pressing of borrage seeds (*Borago officinalis L.)*
5.40.1	**Evening primrose expeller**	Product of oil manufacture obtained by pressing of evening primrose seeds (*Oenothera L.*)
5.41.1	**Pome grenade expeller**	Product of oil manufacture obtained by pressing of pome grenade seeds (*Punica granatum L.*)
5.42.1	**Walnut kernel expeller**	Product of oil manufacture obtained by pressing of walnut kernels (*Juglans regia L.)*

6. Forages and roughage, and products derived thereof

Number	Name	Description
6.1.1	**Beet leaves**	Leaves of *Beta* spp.
6.2.1	**Cereal plants**	Whole plants of cereal species or parts thereof. It may be dried, fresh or ensiled.
6.3.1	**Cereals straw**	Straw of cereals.
6.3.2	**Cereal straw, treated**	Product obtained by an appropriate treatment of cereal straw.
6.4.1	**Clover meal**	Product obtained by drying and milling clover *Trifolium* spp. It may contain up to 20% lucerne (*Medicago sativa* L. and *Medicago* var. *Martyn*) or other forage crops dried and milled at the same time as the clover.
6.5.1	**Forage meal; [Grass meal]; [Green meal]**	Product obtained by drying and milling and in some cases compacting forage plants.
6.6.1	**Grass, field dried, [Hay]**	Species of any grass, field dried.
6.6.2	**Grass, high temperature dried**	Product obtained from grass (any variety) that has been artificially dehydrated (in any form).
6.6.3	**Grass, herbs, legume plants, [green forage]**	Fresh, ensiled or dried arable crops consisting of grass, legumes or herbs, commonly described as silage, haylage, hay or green forage.
6.7.1	**Hemp flour**	Flour ground from dried leaves from C*annabis sativa* L.
6.7.2	**Hemp fibre**	Product obtained during the processing of hemp, green coloured, dried, fibrous.
6.8.1	**Horse bean straw**	Straw of horse bean.
6.9.1	**Linseed straw**	Straw of linseed (*Linum usitatissimum* L.).
6.10.1	**Lucerne; [Alfalfa]**	*Medicago sativa* L. and *Medicago* var. *Martyn* plants or parts thereof.
6.10.2	**Lucerne field dried; [Alfalfa field dried]**	Lucerne, field dried.
6.10.3	**Lucerne, high temperature dried; [Alfalfa, high temperature dried]**	Lucerne artificially dehydrated, in any form.
6.10.4	**Lucerne, extruded; [Alfalfa, extruded]**	Alfalfa pellets that have been extruded.
6.10.5	**Lucerne meal; [Alfalfa meal]**	Product obtained by drying and milling Lucerne. It may contain up to 20% clover or other forage crop dried and milled at the same time as the lucerne.
6.10.6	**Lucerne pomace; [Alfalfa pomace]**	Dried product obtained by pressing of the juice from lucerne.
6.10.7	**Lucerne protein concentrate; [Alfalfa protein concentrate]**	Product obtained by artificially drying fractions of lucerne press juice, which have been separated by centrifugation and heat treated to precipitate the proteins.
6.10.8	**Lucerne solubles**	Product obtained after the extraction of proteins from lucerne juice, it may be dried
6.11.1	**Maize silage**	Ensiled plants or parts thereof of *Zea mays* L. *ssp. mays*.
6.12.1	**Pea Straw**	Straw of *Pisum* spp.

7. Other plants, algae and products derived thereof

Number	Name	Description
7.1.1	**Algae**	Algae, live or processed, including fresh, chilled or frozen algae. May contain up to 0.1% of antifoaming agents.
7.1.2	**Dried algae**	Product obtained by drying algae. This product may have been washed to reduce the iodine content. May contain up to 0.1% of antifoaming agents.
7.1.3	**Algae meal**	Product of algae oil manufacture, obtained by extraction of algae. May contain up to 0.1% of antifoaming agents.
7.1.4	**Algal oil**	Product of the oil manufacture from algae obtained by extraction. May contain up to 0.1% of antifoaming agents.
7.1.5	**Algae extract; [Algae fraction]**	Watery or alcoholic extract of algae that principally contains carbohydrates. May contain up to 0.1% of antifoaming agents.
7.2.6	**Seaweed meal**	Product obtained by drying and crushing macro-algae, in particular brown seaweed. This product may have been washed to reduce the iodine content. May contain up to 0.1% of antifoaming agents.
7.3.1	**Barks**	Cleaned and dried barks of trees or bushes.
7.4.1	**Blossoms, dried**	All parts of dried blossoms of consumable plants and their fractions.
7.5.1	**Broccoli, dried**	Product obtained by drying the plant *Brassica oleracea* L. after washing, size reduction (cutting, flaking, etc.) and water content removal.
7.6.1	**(Sugar) cane molasses**	Syrupy product obtained during the manufacture or refining of sugar from *Saccharum L.* May contain up to 0.5% antifoaming agents. May contain up to 0.5% antiscaling agents. May contain up to 3.5% sulphate. May contain up to 0.25% sulphite.
7.6.2	**(Sugar) cane Molasses, partially desugared**	Product obtained after further extraction using water of sucrose from sugar cane molasses.
7.6.3	**(Cane) sugar [sucrose]**	Sugar extracted from sugar canes using water.
7.6.4	**Cane bagasse**	Product obtained during extraction using water of sugar from sugar canes. It consists mainly of fibres.
7.7.1	**Leaves, dried**	Dried leaves of consumable plants and their fractions.
7.8.1	**Lignocellulose**	Product obtained by means of mechanical processing of raw natural dried wood and which predominantly consists of lignocellulose.
7.9.1	**Liquorice root**	Root of *Glycyrrhiza L.*
7.10.1	**Mint**	Product obtained from drying aerial parts of the plants *Mentha apicata, Mentha piperita* or *Mentha viridis* (L.), regardless of their presentation.
7.11.1	**Spinach, dried**	Product obtained from drying the plant *Spinacia oleracea* L., regardless of its presentation.
7.12.1	**Mojave yucca**	Pulverized *Yucca schidigera* Roezl.
7.13.1	**Vegetal carbon; [charcoal]**	Product obtained by carbonisation of organic vegetal material.
7.14.1	**Wood**	Chemically untreated mature wood or wood fibres.

11. Minerals

Number	Name	Description
11.1.1	**Calcium carbonate; [Limestone]**	Product obtained by grinding sources of calcium carbonate ($CaCO_3$), such as limestone or by precipitation from acid solution. May contain up to 0.25% propylene glycol May contain up to 0.1% grinding aids.
11.1.2	**Calcareous marine shells**	Product of natural origin, obtained from marine shells, ground or granulated, such as oyster shells or seashells.
11.1.3	**Calcium and magnesium carbonate**	Natural mixture of calcium carbonate ($CaCO_3$) and magnesium carbonate ($MgCO_3$). May contain up to 0.1% grinding aids.
11.1.4	**Maerl**	Product of natural origin obtained from calcareous marine algae, ground or granulated.
11.1.5	**Lithothamn**	Product of natural origin obtained from calcareous marine algae (*Phymatolithon calcareum* (Pall.)), ground or granulated.
11.1.6	**Calcium chloride**	Calcium chloride ($CaCl_2$). May contain up to 0.2% barium sulphate
11.1.7	**Calcium hydroxide**	Calcium hydroxide ($Ca(OH)_2$). May contain up to 0.1% grinding aids.
11.1.8	**Calcium sulphate anhydrous**	Calcium sulphate anhydrous ($CaSO_4$) obtained by grinding calcium sulphate anhydrous or dehydration of calcium sulphate dihydrate.
11.1.9	**Calcium sulphate hemihydrate**	Calcium sulphate hemihydrate ($CaSO_4 \times ½ H_2O$) obtained by partially dehydrating calcium sulphate dihydrate.
11.1.10	**Calcium sulphate dihydrate**	Calcium sulphate dihydrate ($CaSO_4 \times 2H_2O$) obtained by grinding calcium sulphate dihydrate or hydration of calcium sulphate hemihydrate.
11.1.11	**Calcium salts of organic acids**	Calcium salts of edible organic acids with at least 4 carbon atoms.
11.1.12	**Calcium oxide**	Calcium oxide (CaO) obtained from calcination of naturally occurring limestone. May contain up to 0.1% grinding aids.
11.1.13	**Calcium gluconate**	Calcium salt of gluconic acid generally expressed as $Ca(C_6H_{11}O_7)_2$ and its

		hydrated forms.
11.1.15	**Calcium Sulphate / Carbonate**	Product obtained during the manufacturing of sodium carbonate.
11.1.16	**Calcium pidolate**	L-calcium pidolate ($C_5H_6CaNO_3$). May contain up to 1.5% glutamic acid and related substances.
11.1.17	**Calcium carbonate-magnesium oxide**	Product obtained by heating of natural calcium and magnesium containing substances like dolomite. May contain up to 0.1% grinding aids.
11.2.1	**Magnesium oxide**	Calcined magnesium oxide (MgO) not less than 70% MgO.
11.2.2	**Magnesium sulphate heptahydrate**	Magnesium sulphate ($MgSO_4$ x 7 H_2O).
11.2.3	**Magnesium sulphate monohydrate**	Magnesium sulphate ($MgSO_4$ x H_2O).
11.2.4	**Magnesium sulphate anhydrous**	Anhydrous magnesium sulphate ($MgSO_4$).
11.2.5	**Magnesium propionate**	Magnesium propionate ($C_6H_{10}MgO_4$).
11.2.6	**Magnesium chloride**	Magnesium chloride ($MgCl_{2)}$ or solution obtained by natural concentration of sea water after deposit of sodium chloride.
11.2.7	**Magnesium carbonate**	Natural magnesium carbonate ($MgCO_3$).
11.2.8	**Magnesium hydroxide**	Magnesium hydroxide ($Mg(OH)_2$).
11.2.9	**Magnesium potassium sulphate**	Magnesium potassium sulphate.
11.2.10	**Magnesium salts of organic acids**	Magnesium salts of edible organic acids with at least 4 carbon atoms.
11.3.1	**Dicalcium phosphate; [Calcium hydrogen orthophosphate]**	Calcium mono-hydrogen phosphate obtained from bones or inorganic sources ($CaHPO_4$ x H_2O) Ca/P > 1.2 May contain up to 3% chloride expressed as NaCl
11.3.2	**Mono-dicalcium phosphate**	Product obtained chemically and composed of dicalcium phosphate and mono-calcium phosphate ($CaHPO_4$. $Ca(H_2PO_4)_2$ x H_2O) 0.8< Ca/P < 1.3
11.3.3	**Mono-calcium phosphate; [Calcium tetrahydrogen diorthophosphate]**	Calcium-bis dihydrogenphosphate ($Ca(H_2PO_4)_2$ x H_2O) Ca/P <0.9
11.3.4	**Tri-calcium phosphate; [Tricalcium orthophosphate]**	Tri-calcium phosphate from bones or inorganic sources ($Ca_3(PO_4)_2$ x H_2O) Ca/P > 1.3
11.3.5	**Calcium-magnesium phosphate**	Calcium-magnesium phosphate.
11.3.6	**Defluorinated phosphate**	Natural phosphate, calcined and further heat treated than for the removal of impurities necessary.
11.3.7	**Di-calcium pyrophosphate; [Dicalcium diphosphate]**	Dicalcium pyrophosphate.
11.3.8	**Magnesium phosphate**	Product consisting of monobasic and/or di-basic and/or tri-basic magnesium phosphate.
11.3.9	**Sodium-calcium-magnesium phosphate**	Product consisting of sodium-calcium-magnesium phosphate.
11.3.10	**Mono-sodium phosphate; [Sodium dihydrogen orthophosphate]**	Mono-sodium phosphate (NaH_2PO_4 x H_2O)
11.3.11	**Di-sodium phosphate; [Disodium hydrogen orthophosphate]**	Disodium phosphate (Na_2HPO_4 x H_2O)
11.3.12	**Tri-sodium Phosphate; [Trisodium orthophosphate]**	Tri-sodium phosphate (Na_3PO_4)
11.3.13	**Sodium pyrophosphate; [Tetrasodium diphosphate]**	Sodium pyrophosphate ($Na_4P_2O_7$).
11.3.14	**Mono-potassium phosphate; [Potassium dihydrogen orthophosphate]**	Mono-potassium phosphate (KH_2PO_4 x H_2O)
11.3.15	**Di-potassium phosphate; [Di-potassium hydrogen orthophosphate]**	viii. Di-potassium phosphate (K_2HPO_4 x H_2O)
11.3.16	**Calcium sodium phosphate**	Calcium sodium phosphate ($CaNaPO_4$).
11.3.17	**Mono-ammonium phosphate; [Ammonium dihydrogen orthophosphate]**	Mono-ammonium phosphate ($NH_4H_2PO_4$)
11.3.18	**Di-ammonium phosphate; [Diammonium hydrogen orthophosphate]**	Di-ammonium phosphate ($(NH_4)_2HPO_4$)
11.3.19	**Sodium tri-polyphosphate; [Penta sodium triphosphate]**	Sodium tri-polyphosphate ($Na_5P_3O_9$).
11.3.20	**Sodium magnesium phosphate**	Sodium-magnesium phosphate ($MgNaPO_4$).
11.3.21	**Magnesium hypophosphite**	Magnesium hypophosphite ($Mg(H_2PO_2)_2$ x $6H_2O$)
11.3.22	**Degelatinised bone meal**	Degelatinised, sterilised and ground bones from which the fat has been removed.
11.3.23	**Bone ash**	Mineral residues from the incineration, combustion or gasification of animal by-

		products.
11.3.24	**Calcium polyphosphate**	Heterogeneous mixtures of calcium salts of condensed polyphosphoric acids of general formula H(n+2)PnO(3n+1) where 'n' is not less than 2
11.3.25	**Calcium dihydrogen diphosphate**	Mono-calcium dihydrogen pyrophosphate($CaH_2P_2O_7$).
11.3.26	**Magnesium acid pyrophosphate**	Magnesium acid pyrophosphate ($MgH_2P_2O_7$.) Produced from purified phosphoric acid and purified magnesium hydroxide or magnesium oxide by evaporation of water and condensation of the orthophosphate to diphosphate.
11.3.27	**Disodium dihydrogen diphosphate**	Disodium dihydrogen diphosphate ($Na_2H_2P_7O_7$).
11.3.28	**Tri-sodium diphosphate**	Trisodium monohydrogen diphosphate (anhydrous: $Na_3HP_2O_7$; monohydrate: $Na_3HP_2O_7$ x H_2O)
11.3.29	**Sodium polyphosphate; [Sodium hexametaphosphate]**	Heterogeneous mixtures of sodium salts of linear condensed polyphosphoric acids of general formula H(n+2)PnO(3n+1) where 'n' is not less than 2
11.3.30	**Tri-potassium phosphate**	Tripotassium monophosphate (anhydrous: K_3PO_4; hydrated: K_3PO_4 x n H_2O (n=1 or 3)).
11.3.31	**Tetrapotassium di-phosphate**	Tetrapotassium pyrophosphate $K_4P_2O_7$)
11.3.32	**Pentapotassium tri-phosphate**	Pentapotassium tri-polyphosphate ($K_5P_3O_{10}$)
11.3.33	**Potassium polyphosphate**	Heterogeneous mixtures of potassium salts of linear condensed polyphosphoric acids of general formula H(n+2)PnO(3n+1) where 'n' is not less than 2
11.3.34	**Calcium sodium polyphosphate**	Calcium sodium polyphosphate.
11.4.1	**Sodium chloride**	Sodium chloride (NaCl) or product obtained by evaporative crystallization from brine (vacuum salt) or evaporation of seawater (marine salt) or grinding rock salt.
11.4.2	**Sodium bicarbonate [Sodium hydrogencarbonate]**	Sodium bicarbonate ($NaHCO_3$)
11.4.3	**Sodium/ammonium (bi)carbonate [Sodium/ammonium (hydrogen)carbonate]**	Product obtained during the production of sodium carbonate and sodium bicarbonate, with traces of ammonium bicarbonate (ammonium bicarbonate max. 5%).
11.4.4	**Sodium carbonate**	Sodium carbonate (Na_2CO_3)
11.4.5	**Sodium sesquicarbonate [Trisodium hydrogendicarbonate]**	Sodium sesquicarbonate ($Na_3H(CO_3)_2$)
11.4.6	**Sodium sulphate**	Sodium sulphate (Na_2SO_4). May contain up to 0.3% methionine
11.4.7	**Sodium salts of organic acids**	Sodium salts of edible organic acids with at least 4 carbon atoms.
11.5.1	**Potassium chloride**	Potassium chloride (KCl) or product obtained by grinding natural sources of potassium chloride.
11.5.2	**Potassium sulphate**	Potassium sulphate (K_2SO_4)
11.5.3	**Potassium carbonate**	Potassium carbonate (K_2CO_3).
11.5.4	**Potassium bicarbonate [Potassium hydrogen carbonate]**	Potassium bicarbonate ($KHCO_3$).
11.5.5	**Potassium salts of organic acids**	Potassium salts of edible organic acids with at least 4 carbon atoms.
11.6.1	**Flower of sulphur**	Powder obtained from natural deposits of the mineral. Also, product obtained from oil refinery production as practised by sulphur manufacturers.
11.7.1	**Attapulgite**	Natural magnesium-aluminium-silicon mineral.
11.7.2	**Quartz**	Naturally occurring mineral obtained by grinding sources of quartz. May contain up to 0.1% grinding aids.
11.7.3	**Cristobalite**	Silicon dioxide (SiO_2) obtained from the re-crystallisation of quartz. May contain up to 0.1% grinding aids.
11.8.1	**Ammonium sulphate**	Ammonium sulphate ($(NH_4)_2SO_4$) obtained by chemical synthesis.
11.8.2	**Ammonium sulphate solution**	Ammonium sulphate in aqueous solution, containing not less than 35% Ammonium sulphate
11.8.3	**Ammonium salts of organic acids**	Ammonium salts of edible organic acids with at least 4 carbon atoms.
11.8.4	**Ammonium lactate**	Ammonium lactate ($CH_3CHOHCOONH_4$). Includes the Ammonium lactate produced by fermentation with *Lactobacillus delbrueckii ssp. Bulgaricus, Lactococcus lactis ssp., Leuconostoc mesenteroides, Streptococcus thermophilus, Lactobacillus spp, or Bifidobacterium spp.*, containing not less than 44% Nitrogen expressed as crude protein. May contain up to 0.8% phosphorus, 0.9% potassium, 0.7% magnesium, 0.3% sodium, 0.3% sulphates 0.1% chlorides, 5% sugars and 0.1% silicone antifoam.
11.8.5	**Ammonium acetate**	Ammonium acetate (CH_3COONH_4) in aqueous solution, containing not less than 55% Ammonium acetate)

These materials may be defined further on the label by processes they have undergone, such as: dried, flaked, extruded, flour, toasted, pelleted etc. Thus examples of feed materials as listed on a label would be: dried peas, extruded wheat and flaked maize.

If a feed material does not correspond exactly with the definition given above, an alternative accurate description of the feed material should be used. Several other feed materials not in the EU catalogue are also legitimately used for rabbit foods, provided they are safe and accurately described on the label. A few examples of additional feed materials are given in Table 2.

Some examples of additional feed materials for rabbit food not in the EU Catalogue, but which are included in the Register of Feed Materials (http://www.feedmaterialsregister.eu/)

Name	Description
Hay or Meadow Hay	Dried grass or sedge cut from meadows and dried.
Timothy hay	Dried grass of the species *Phleum pratense*.
Apple	Fruit of the tree *Malus domestica*.
Carob meal, extruded	Seeds and pods of the carob tree, *Ceratonia siliqua*, dried, ground and extruded.
Parsley, dried or oil	Parsley, *Petroselinum* sp. leaves; dried or the extracted oil
Herbs	Several herbs may be used in rabbit foods including Anise, *Pimpinella anisum;* Oregano, *Oregano vulgarum*; Rosemary, *Rosmarinus officinalis* and others
Cellulose fibre	Pulp made from wood is dissolved and purified and dried to make cellulose. Cellulose with varying lengths of fibre is available and can be a source of fibre in the diet.
Spinach	Leaves of the species *Spinacia oleracea*,
Dandelion	Leaves, and sometimes flower heads, of the species *Taraxacum officinale*, or the genus *Taraxacum*. Often included in a food as dried dandelion.

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