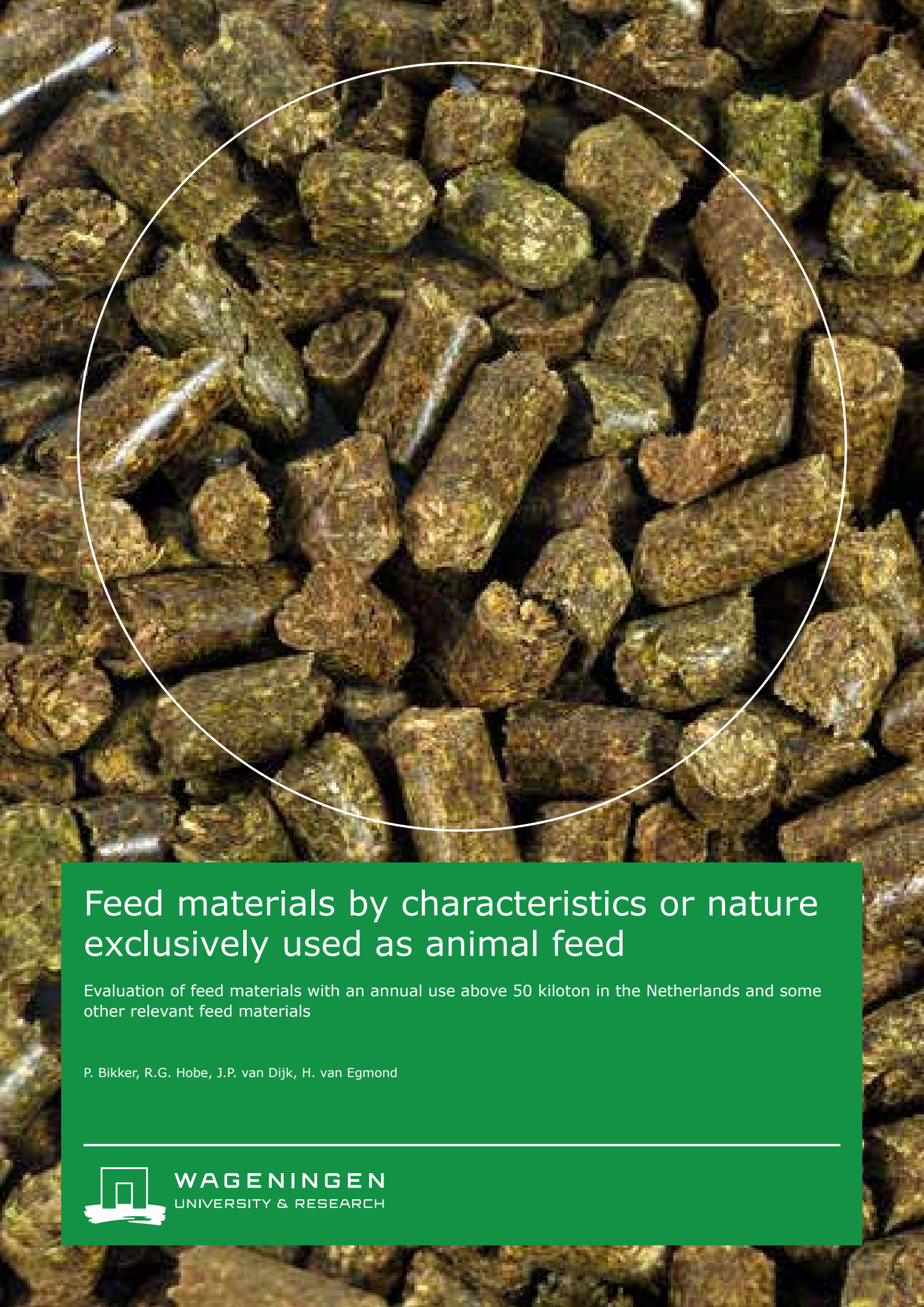

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This research has been carried out by Wageningen Food Safety Research, institute within the legal entity Wageningen Research Foundation subsidised by the Dutch Ministry of Agriculture, Nature and Food Quality in the Statutory Tasks Programme for Food Safety (project number WOT-02-004-013).

Wageningen, May 2024

WFSR Report 2024.003

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Bikker, P., R.G. Hobe, J.P. van Dijk, H. van Egmond, 2024. *Feed materials by characteristics or nature exclusively used as animal feed; Evaluation of feed materials with an annual use above 50 kiloton in the Netherlands.* Wageningen, Wageningen Food Safety Research, WFSR Report 2024.003. 36 pp.; 0 fig.; 6 tab.; 10 ref.

BAS-code: WOT-02-004-013
Project title: Juridische eisen met betrekking tot analyse- en bemonsteringsmethoden gebruikt in het opsporingsonderzoek van diervoeders en diervoedergrondstoffen
Project leader: P. Bikker

This report can be downloaded for free at https://doi.org/10.18174/657846 or at www.wur.eu/food-safety-research (under WFSR publications).

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WFSR report 2024.003

Contents

Summary

Regulation (EC) No. 396/2005 sets maximum residue limits (MRLs) for pesticide residues in food and feed. In Annex I, part A, a specific category (category 1200000) has been dedicated to products that are used exclusively for animal feed production. At present, this category is empty and does not contain feed materials. Instead, the regulation refers to footnote 1. This footnote indicates that MRLs do not apply to products or parts of products that by their characteristics or nature, are used exclusively as animal feed ingredients (in this report referred to as "feed only") until separate MRLs are set in the specific category 1200000. Consequently, at present no MRLs apply to "feed only" products. This study was conducted at the request of the NVWA in order to obtain a list of products that could be classified as "feed only" products based on objective criteria and a transparent approach. This classification is limited to plant-derived feed materials with an annual use above 50 kton in the Netherlands (45 products). In addition, some plant derived feed materials with lower usage, milk products, mineral products, and products of fat and oil processing, were added because of their practical relevance. Hence, in total 60 feed materials were evaluated. The sources of information used in this study were the EU feed material Catalogue (Commission Regulation (EU) No 68/2013), the EFSA FoodEx2 database, information on use in human food in literature and on the internet, and the Pesticides Regulation (EC) No. 396/2005.

The following products were classified as "feed only" in this study:
- products which are not included in the EFSA FoodEx2 database for food, and for which no food application was found on internet using Google as search engine and the name of the product in combination with "food" in Dutch and English as search terms;
- products which (may) contain(s) processing aids according to the feed material Catalogue and for which an identical product without processing aids is described in the feed materials Catalogue;
- (milk) products specifically prepared as feed material and containing processing aids.

By applying these criteria, 42 of the 60 evaluated feed materials were classified as "feed only" products (see Table 1). The "feed only" products are mainly roughages and co-products of food production and processing.

Due to the restriction in the scope, Table 1 does not represent an exclusive list of all "feed only" products in the Netherlands. A large number of feed materials with annual usage less than 50 kton was not included in this study and need to be evaluated on a case by case basis. Moreover, the classification as "feed only" or not may change over time because of technological and societal developments and by specification in EU guidance documents or legislation. Since application of products for food and feed may change over the years, e.g. to improve circularity of food production, it is recommended to regularly evaluate and update the list of "feed only" products in Table 1. Finally it is recommended to include "feed only" products in category 1200000 of Regulation (EC) 365/2005, specifically aimed for this purpose, and develop appropriate MRLs to facilitate official control of these feed materials.

Disclaimer
Wageningen Food Safety Research (WFSR), commissioned by the Dutch Food and Consumer Product Safety Authority (NVWA), has compiled a list of animal feed products with a "feed only" status (not intended for human consumption). No rights can be derived from this list. The NVWA reserves the right to deviate from the provisions/statements of this report. The list of "feed only" products in this report is not exhaustive. It includes the most common products at the time of publication, based on information from sources consulted by WFSR. The report and the list provide no guarantees for the future.

If products designated as 'feed only' are used in human food after publication of this report, these products lose their "feed only" status. Products from the "feed only" list may also receive a different status due to legislative changes, recommendations, guidelines or changed policy from the European Commission. The report does not have international status. It represents a Dutch perspective. Other European member states may have different perspectives. The NVWA will not mediate in any disputes with other EU member states.
Companies are responsible for verifying the approach followed by other European member states themselves.

Table 1 *List of "feed only" products (n=42) derived from a dataset of 60 evaluated feed materials which were selected on annual use (above 50 kton) and practical relevance; products are in dry form unless mentioned otherwise.*

Number EU Catalogue	Name	Number EU Catalogue	Name
1.2.9	Maize gluten feed, liquid or dry	2.19.6	Sunflower seed meal feed
1.6.11	Rice bran with calcium carbonate	2.19.7	Sunflower seed meal feed, dehulled
1.11.16	Wheat gluten feed, liquid or dry	4.1.4	(Sugar) beet molasses
1.11.19	Liquid wheat starch	4.1.5	(Sugar) beet - molasses, partially desugared and/or debetainized
1.11.22	Wheat yeast concentrate, liquid	4.1.8	Pressed (sugar) beet pulp, liquid
1.12.11	Distillers' dried grains and solubles	4.1.10	Dried (sugar) beet pulp
1.12.12	Brewers' grains, liquid or dry	4.8.3	Potato peelings, steamed, liquid
2.8.4	Linseed expeller feed	4.8.8	Potato pulp, liquid
2.12.1	Palm kernel - expeller	5.13.2	Citrus pulp, dried
2.14.2	Rape seed - expeller	6.3.1	Cereals straw
2.14.6	Rape seed - expeller feed	6.6.1	Grass, field dried, [Hay]
2.14.3	Rape seed meal	6.6.3	Grass, herbs, legume plants, [green forage]
2.14.7	Rape seed meal feed	6.10.1	Lucerne meal; [Alfalfa] (as roughage)
2.18.1	Toasted soya (beans), only if rumen protected	6.10.5	Lucerne meal; [Alfalfa meal]
2.18.3	Soya bean meal, only if rumen protected)	6.11.1	Maize silage
2.18.4	Soya bean meal (dehulled), only if rumen protected	7.6.1	(Sugar) cane molasses
2.18.5	Soya (bean) hulls	8.17.1	Whey/whey powder (liquid or dry), only with processing aids
2.18.13	Soya (bean) meal feed	8.18.1	Delactosed whey/whey powder (liquid or dry), only with processing aids
2.18.14	Soya (bean) meal feed, dehulled	12.3.1	Vinasses - [condensed molasses soluble] -
2.19.3	Sunflower seed meal	13.6.1	Acid oils from chemical refining
2.19.4	Sunflower seed meal, dehulled	13.6.5	Fatty acid distillates from physical refining

1 Introduction

During the cultivation and post-harvest treatment of crops, plant protection products are used for the control of pests and diseases. As a result, residues of these products may be present on the crops. Therefore, Regulation (EC) No. 396/2005 sets maximum residue limits (MRLs) for pesticide residues in crops used for food and feed. These MRLs are based on good agricultural practice (GAP) for the European situation. The same MRLs apply for food and feed materials if the same materials are used for both food and feed. If this is not the case, the Regulation provides a separate category (Annex I, part A, category 1200000) for products used exclusively for animal feed production. Up until today the European Commission has left this category empty, meaning that no MRLs apply until the Commission lays down MRLs for these specific products (Annex I, part A, footnote 8) and no feed materials have been defined as "feed only" materials. Instead the Regulation refers to footnote 1, indicating that MRLs do not apply to products or parts of products that by their characteristics or nature, are used exclusively as animal feed ingredients (in this report referred to as "feed only") until separate MRLs are set in the specific category 1200000.

The NVWA and the feed industry in the Netherlands would like to have a documented list of "feed only" materials in order to have a common understanding about feed materials that can be regarded as "feed only". This is necessary because if a feed material contains a pesticide residue and the material is classified as a "feed only", no MRL applies and the feed business operator needs to conduct a risk analysis before putting the feed on the market and using it in animal feed. The animal feed sector has already classified a number of feed materials as "feed only" and included these in a Pesticide Residue Risk Assessment Tool. In addition, NVWA developed a classification of a limited number of feed only materials for internal use. However, at the start of this study no complete and transparent classification of "feed only" materials was available. Therefore, this study was conducted to develop criteria for the classification of feed materials as "feed only" on the basis of their use in feed and food and subsequently apply these criteria to provide a short list of most relevant "feed only" feed materials. The list could in time also be used as a proposal to be included in category code 1200000 of Regulation (EC) No. 396/2005.

2 Material and methods

In this report a classification of feed materials is made on the basis of their use in food and/or feed to derive a "feed only" list of products that, due to their characteristics or nature, are exclusively used as ingredients for animal feed. The scope is restricted to feed materials with an annual use in the Netherlands above 50 kton, supplemented with a few other feed materials of practical relevance.

The sources used to identify "feed only" feed materials are:
- the EU Catalogue of feed materials (Commission Regulation (EU) No. 68/2013)
- Pesticide Regulation (EC) No. 396/2005
- the list of feed materials with an annual use above 50 kton (SecureFeed, personal communication)
- the EFSA FoodEx2 database. See https://www.efsa.europa.eu/en/data/data-standardisation, downloaded version of October 2021
- the internet (search with google as search machine).

2.1 Selection of feed materials

As starting point the EU Catalogue of feed materials (Commission Regulation (EU) No. 68/2013 on the Catalogue of feed materials) was used. This Catalogue distinguishes 13 categories or chapters of feed materials (Table 2). This study is restricted to feed materials listed in the plant derived product categories (categories 1-7 and the plant-derived products in category 13). These contain the majority of (plant based) feed materials for which pesticides may have been used. In order to further narrow down the scope, only feed materials with an annual use in the Netherlands above 50 kton (SecureFeed, personal communication) were addressed. In addition, some plant derived feed materials with lower usage, milk products, mineral products, and products of fat and oil processing were added on request of the NVWA because of their practical relevance.

Table 2 *Categories or chapters of feed materials as used in the European Catalogue of feed materials.*

Chapter	Description
1	Cereal grains and products derived thereof
2	Oil seeds, oil fruits, and products derived thereof
3	Legume seeds and products derived thereof
4	Tubers, roots, and products derived thereof
5	Other seeds and fruits, and products derived thereof
6	Forages and roughage, and products derived thereof
7	Other plants, algae and products derived thereof
8	Milk products and products derived thereof
9	Land animal products and products derived thereof
10	Fish, other aquatic animals and products derived thereof
11	Minerals and products derived thereof
12	Products and co-products obtained by fermentation using micro-organisms, inactivated resulting in absence of live micro-organisms
13	Miscellaneous

2.2 Products used in human food

To determine whether the products from the feed material Catalogue are also used as food, the EFSA FoodEx2 database was used as source of products used as human food. For each feed material, it was determined whether a similar product was included in the extended list in FoodEx2 for human food. Based on the name (term Extended Name) and description (term Scope Note) of the food and feed products in FoodEx2 and the Catalogue of feed materials, each selected feed material was compared with related food products. When a product was the same, similar or included in the description of one or more food products, it was concluded that the feed materials was not exclusively used in animal feed and not classified as "feed only".

After having conducted this comparison, a significant number of products from the feed material Catalogue could not be found in the FoodEx2 database, because the database does not comprise a complete list of all existing food products. Therefore, a subsequent search for potential applications of the products in human food was conducted on internet using Google as search engine and the name of the feed materials in combination with "food" in Dutch and English as search terms. This resulted in information about suppliers of the products for food application, scientific information and information from public bodies on the use of the product in food. Based on this information and characteristics of the products, these products were further classified as "feed only" or "not feed only".

2.3 Chemical impurities

The EU Catalogue of feed materials describes that feed materials shall be free from chemical impurities resulting from their manufacturing process and from processing aids, unless a specific maximum content is set in the Catalogue (see also Annex 1). This raised the question whether presence of impurities and processing aids would destine a product as "feed only".

In EU Feed legislation (Regulation (EC) 1831/2003) processing aids are defined as:
"any substance not consumed as a feedingstuff by itself, intentionally used in the processing of feedingstuffs or feed materials to fulfil a technological purpose during treatment or processing which may result in the unintentional but technologically unavoidable presence of residues of the substance or its derivatives in the final product, provided that these residues do not have an adverse effect on animal health, human health or the environment and do not have any technological effects on the finished feed"

In EU Food legislation (Regulation (EC) 1333/2008) processing aids are similarly defined as:
any substance which:
(i) is not consumed as a food by itself;
(ii) is intentionally used in the processing of raw materials, foods or their ingredients, to fulfil a certain technological purpose during treatment or processing; and
(iii) may result in the unintentional but technically unavoidable presence in the final product of residues of the substance or its derivatives provided they do not present any health risk and do not have any technological effect on the final product.

With respect to "chemical impurities" the feed material Catalogue frequently describes two identical feed materials which only differ in the potential presence of processing aids. For example rice bran (1.6.10) and rice bran with calcium carbonate (1.6.11) or linseed expeller (2.8.2) and linseed expeller feed (2.8.4) which may contain up to 1% bleaching earth, 2% of soap stocks or 1.3% of crude lecithins. The chemical impurities in these products cannot be regarded as "technically unavoidable" due to the availability of the product without chemical impurities. This means that for food application these chemical impurities cannot be regarded as processing aids and the "products without chemical impurities" have to be used. All feed materials which may containing processing aids and for which identical "feed materials without chemical impurities" are described in the feed Catalogue are therefore classified as "feed only" in this study.

For some milk products the feed material Catalogue specifies that only products specifically prepared as feed material, may contain certain processing aids. This is for example the case with whey/whey powder (8.17.1):

Whey/whey powder: Product of cheese, quark or casein manufacturing or similar processes. Where specifically prepared as feed material, may contain:

- *up to 0,5% phosphates e.g. polyphosphates (e.g. sodium hexametaphosphate), diphosphates (e.g. tetrasodiumpyrophosphate), used to decrease the viscosity and to stabilise protein during processing;*
- *up to 0,3% inorganic acids: sulphuric acid, hydrochloric acid, phosphoric acid, used for pH adjustments in many stages of production processes;*
- *up to 0,5% alkali e.g. sodium, potassium, calcium, magnesium hydroxides, used for pH adjustments in many stages of production processes;*
- *up to 2% free-flowing agents e.g. silicium dioxide, penta-sodium-triphosphate, tri-calcium-phosphate, used to improve.*

On the basis of this formulation in the feed material Catalogue all "(milk) products specifically prepared as feed material and containing processing aids" are classified as "feed only" in this study.

3 Results

In the following paragraphs the selection of feed materials and results of the evaluation are presented.

3.1 Selection of feed materials

In order to further narrow down the scope, only feed materials with an annual use in the Netherlands above 50 kton (See 3.1.1) or practical relevance (see 3.1.2) are evaluated in this study.

3.1.1 Feed materials with annual usage above 50 kton in the Netherlands

Table 3 includes a list of products with an annual usage as animal feed in the Netherlands above 50 kton, including roughages, liquid co-products and feed materials generally included in compound feed (SecureFeed, personal communication).

Table 3 *Feed materials selected on the basis of usage in animal feed, with an annual volume above 50 kton in the Netherlands. Products are in dry form unless mentioned otherwise.*

Nr	Number EU Catalogue	Name	Nr	Number EU Catalogue	Name
1	1.1.1	Barley grain	24	2.18.4	Soya (bean) meal, dehulled
2	1.2.1	Maize grain	25	2.18.14	Soya (bean) meal feed, dehulled
3	1.2.9	Maize gluten feed (liquid or dry)	26	2.18.5	Soya (bean) hulls
4	1.4.1	Oat grain	27	2.19.3	Sunflower seed meal
5	1.4.6	Oat hulls	28	2.19.4	Sunflower seed meal, dehulled
6	1.7.1	Rye grain	29	2.19.6	Sunflower seed meal feed
7	1.10.1	Triticale grain	30	2.20.1	Vegetable fats and oils, edible
8	1.11.1	Wheat grains	31	3.11.1	Peas (dry seeds)
9	1.11.7	Wheat bran	32	4.1.4	(Sugar) beet molasses
10	1.11.16	Wheat gluten feed (liquid or dry)	33	4.1.5	(Sugar) beet - molasses, partially desugared and/or debetainized
11	1.11.19	Liquid wheat starch	34	4.1.8	Pressed (sugar) beet pulp(liquid)
12	1.11.22	Wheat yeast concentrate (liquid)	35	4.1.10	Dried (sugar) beet pulp
13	1.12.11	Distillers' dried grains and soluble	36	4.8.1	Potatoes
14	1.12.12	Brewers' grains (liquid or dry)	37	4.8.3	Potato peelings, steamed(liquid)
15	2.12.1	Palm kernel - expeller	38	4.8.8	Potato pulp(liquid)
16	2.14.2	Rape seed - expeller	39	5.13.2	Citrus pulp, dried
17	2.14.6	Rape seed – expeller feed	40	6.3.1	Cereals straw
18	2.14.3	Rape seed meal	41	6.6.1	Grass, field dried, [Hay]
19	2.14.7	Rape seed meal feed	42	6.6.3	Grass, herbs, legume plants, [green forage]
20	2.18.1	Toasted soya (beans)	43	6.10.5	Lucerne meal; [Alfalfa meal]
21	2.18.2	Soya (bean) expeller	44	6.11.1	Maize silage
22	2.18.3	Soya (bean) meal	45	7.6.1	(Sugar) cane molasses
23	2.18.13	Soya (bean) meal feed			

3.1.2 Feed materials with other practical relevance

In addition to the feed materials with annual use above 50 kton in Table 3, some specific plant derived feed materials with lower usage, milk products, mineral products, and products of fat and oil processing were added on request of the NVWA because of their practical relevance (Table 4).

Table 4 *Feed materials added on request of the NVWA on the basis of practical relevance. Product are in dry form unless mentioned otherwise.*

Nr	Number EU Catalogue	Name	Nr	Number EU Catalogue	Name
46	1.6.10	Rice bran	54	8.18.1	Delactosed whey/delactosed whey powder (with processing aids) (liquid or dry)
47	1.6.11	Rice bran with calcium carbonate	55	11.1.1	Calcium carbonate; [Limestone]
48	2.8.2	Linseed expeller	56	11.4.1	Sodium chloride
49	2.8.4	Linseed expeller feed	57	12.3.1	Vinasses - [condensed molasses soluble]
50	2.19.2	Sunflower seed expeller	58	13.1.1	Products from the - bakery and pasta - industry
51	2.19.7	Sunflower seed meal feed, dehulled	59	13.6.1	Acid oils from chemical refining
52	6.10.1	Lucerne (alfalfa)	60	13.6.5	Fatty acid distillates from physical refining
53	8.17.1	Whey/whey powder (with processing aids) (liquid or dry)			

The combination of 3.1.1 and 3.1.2 resulted in 60 feed materials that were evaluated in this study.

3.2 Comparison of products and classification

Table 5 contains a comparison between the products with an annual usage as animal feed in the Netherlands above 50 kton (Table 3) and the presence of similar products as food in the FoodEx2 database (food MTX). The table includes the description in the EU Catalogue of feed materials (including presence of processing aids, see also Annex 1) and the matching food product in FoodEx2 and the description of this product. Also a brief consideration is included to clarify the subsequent classification as exclusively used for animal feed, "feed only", or not. This includes additional information reflecting whether or not information was found indicating that the respective feed materials are (likely) used as human food or not.

Table 5 *Feed materials selected on the basis of annual usage (volume) in animal feed and practical relevance in the Netherlands with classification as "feed only" (FO) or "not feed only" (NFO) based on use in animal feed and human food, with considerations used for this classification.*

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
1.1.1	Barley grain	Barley grains (Hordeum vulgare L.) for animal feed	No	A000P, barley grains	Cereal grains from the plant classified under the species Hordeum vulgare L., commonly known as Barley grains. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.2.1	Maize grain	Grains of Zea mays L. ssp. mays. It may be rumen protected.	No	A000T, maize grain	Cereal grains from the plant classified under the species Zea mays L. subsp. mays, commonly known as Maize grain or Corn grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
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 oil extraction of maize germs. Other products derived from starch and from the refining or fermentation of starch products may be added.	Yes/No	none	-	Co-product with poorly specified and variable composition. No information or indications on use in human food.	FO
1.4.1	Oat grain	Grains of Avena sativa L. and other cultivars of oats	No	A000G, oat grain	Cereal grains from the plant classified under the species Avena sativa L., commonly known as Oat grain or Cultivated oat. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.4.6	Oat hulls	Product obtained during dehulling of oat grains.	No	none	--	Oat hulls gain increasing interest as fibre source for human food, e.g. to increase fibre content and reduce energy density. https://www.dieetwebshop.nl; BAKERpedia.com	NFO
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.	No	A0F6P, rice bran	The group includes any type of bran from rice grains milling process. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity	Rice bran is increasingly used as (functional) food ingredient in a variety of food products, primarily in Asia (Gul et al., 2015; Bodie et al., 2019).	NFO
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.	No	none	--	Rice bran without supplemented calcium carbonate (1.6.10) is available for food applications. Therefore product 1.6.11 with processing aids is regarded as "feed only" product.	FO
1.7.1	Rye grain	Grains of Secale cereale L.	No	A001K	Cereal grains from the plant classified under the species Secale cereale L., commonly known as Rye grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
1.10.1	Triticale grain	Grains of Triticum × Secale cereale L. Hybrid	No	A001V	Cereal grains from the plant classified under the genus x Triticosecale Wittm. ex A. Camus., commonly known as Triticale grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.11.1	Wheat grains	Grains of Triticum aestivum L., Triticum durum Desf. and other wheat cultivars. It may be rumen protected.	No	A001N, Common wheat grain	Cereal grains from the plant classified under the species Triticum aestivum L., commonly known as Common wheat grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
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.	No	A004P, wheat bran	The group includes bran from any type of wheat (Triticum spp.). The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Large overlap between products for feed and food. Wheat bran for food may contain (a larger part) part of endosperm, although the food product also acknowledges heterogeneity.	NFO
1.11.16	Wheat gluten feed	Product from 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.	Yes/No	none	--	Co-product with poorly specified and variable composition. No information or indications on use in human food. Vital gluten (1.11.17) are also used in human food.	FO
1.11.19	Liquid wheat starch	Product obtained from the production of starch/glucose and gluten from wheat.	Yes	A004M, wheat starch	The group includes any type of wheat starch, excluding modified starch, that is listed among additives, according to the EU regulation. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Wheat starch for food is a relatively pure and dry product. Liquid wheat starch comprises process water with remaining particles of mainly starch, and smaller amounts of protein, fibre and sugars. This product is not used for human consumption	FO
1.11.22	Wheat yeast concentrate	Wet co-product that is released after the fermentation of wheat starch for alcohol production.	Yes	none	--	Co-product with poorly specified and variable composition. No information or indications on use in human food.	FO
1.12.11	Distillers' dark grains [Distillers' dried grains and solubles]	Product of alcohol distillation obtained by drying solid residues of fermented grains to which pot ale syrup or evaporated spent wash has been added. It may be rumen protected.	No	none	--	Co-product with poorly specified and variable composition. No information or indications on use in human food.	FO
1.12.12	Brewers' grains	Product of brewing composed of residues from 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	Yes/No	none	--	Co-product with poorly specified and variable composition. May contain processing aids. No information or indications on use in human food.	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
2.8.2	Linseed expeller	Product of oil manufacture, obtained by pressing linseed.	No	none	--	Co-product of oil production. For human food primarily full fat linseed is used. Nonetheless, defatted linseed meal (approx. 8% fat) is offered for food. E.g. https://www.jumbo.com/producten/smaakt-bio-lijnzaadmeel-400g-450565ZK	NFO
2.8.4	Linseed expeller feed	Product of oil manufacture, obtained by pressing linseed. Only when produced at an integrated crushing and refining site, the product may contain up to: — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% of crude lecithins — 2% of soap stocks	No	None	--	Co-product of oil production. No information or indications on use in human food. Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.8.2) this product (2.8.4) is classified as "feed only".	FO
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.	No	none	--	Co-product of oil production. No information or indications on use in human food.	FO
2.14.2	Rape seed - expeller	Product of oil manufacture, obtained by pressing seeds of rape. It may be rumen protected.	No	none	--	Co-product of oil production. No information or indications on use in human food. This may change in the future since use of rapeseed protein for food gains interest. https://www.tandfonline.com/doi/full/10.1080/10408398.2020.1809342	FO
2.14.3	Rape seed meal	Product of oil manufacture, obtained by extraction and appropriate heat treatment of rape seed expeller. It may be rumen protected.	No	none	--	Co-product of oil production. No information or indications on use in human food. See also 2.14.2, 2.14.6	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
2.14.6	Rape seed – expeller feed	Product of oil manufacture, obtained by pressing seeds of rape. It may be rumen protected. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% of crude lecithins — 2% of soap stocks.	No	none	--	Co-product of oil production. No information or indications on use in human food. Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.14.2) this product (2.14.6) is classified as "feed only".	FO
2.14.7	Rape seed meal feed	Product of oil manufacture, obtained by extraction and appropriate heat treatment of rape seed expeller. It may be rumen protected. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% of crude lecithins — 2% of soap stocks.	No	None	--	Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.14.3) this product (2.14.7) is classified as "feed only".	FO
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.). It may be rumen protected.	No	A012F, soyabeans (without pods) A0DCH, Soyabeans for consumption (dry)	Pulses (dried legume seeds) from the plant classified under the species Glycine max (L.) Merr., commonly known as Soyabeans for consumption (dry) or Edamame (dry). The part consumed/analysed is not specified.	Identical products for feed and food. Dry roasted or toasted beans are offered as human food, e.g. as toasted full fat soybean meal. In the specific case the product is rumen protected, it can be regarded as FO. https://www.de-zuidmolen.nl/divers-meel-en-graanprodukten/diverse-melen/sojameel/	NFO FO (if rumen protected)
2.18.2	Soya (bean) expeller	Product of oil manufacture, obtained by pressing the seed of soya	No	none	--	Co-product of oil production, suited for human food and used for further processing of soy protein concentrate. An example of a product can be found at https://www.aminola.com/nl/producten/sojameel-50/	NFO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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.). – It may be rumen protected.	No	none	--	Co-product of oil production, suited for human food and feed. Can be used for further processing of soy food products. E.g. https://www.agrilinkage.com/post/ soybean-meal-uses; https://www.rivm.nl/documenten/ nevo-online-versie. Specifically for feed, code 2.18.13 can be used.	NFO (FO, if rumen protected)
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.). It may be rumen protected.	No	none	--	Co-product of oil production, suited for human food and feed. Can be used for further processing of soy food products. E.g. https://www.agrilinkage.com/post/ soybean-meal-uses; https://www.rivm.nl/documenten/ nevo-online-versie. Specifically for feed, code 2.18.14 can be used.	NFO (FO, if rumen protected)
2.18.5	Soya (bean) hulls	Product obtained during dehulling of soya beans.	No	none	--	Soybean hulls are a co-product of soybean processing for oil and soybean meal production. At present the use of soybean hulls in human food seems low or negligible. This may change in the future since use of soybean hulls gain interest because of the high content of insoluble fibre with beneficial effects in nutrition and health (e.g. obesities) (Liu and Li, 2017). Hulls are not included in the product definition of the pesticide regulation.	FO
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.). – It may be rumen protected. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% crude lecithins — 1,5% soap stocks.	No	none	--	Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.18.3) this product (2.18.13) is classified as "feed only".	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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.). It may be rumen protected. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% crude lecithins — 1,5% soap stocks.	No	none	--	Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.18.4) this product (2.18.14) is classified as "feed only".	FO
2.19.2	Sunflower seed expeller	Product of oil manufacture, obtained by pressing seeds of the sunflower.	No	none	--	Co-product of oil production. Defatted sunflower meal (7-15% fat) is offered for food application. E.g. https://www.sukrin.nl/ zonnebloemmeel-400g	NFO
2.19.3	Sunflower seed meal	Product of oil manufacture, obtained by extraction and appropriate heat treatment of sunflower seed expeller. It may be rumen protected.	No	none	--	Co-product of oil production. No information or indications on use in human food.	FO
2.19.6	Sunflower seed meal feed	Product of oil manufacture, obtained by extraction and appropriate heat treatment of sunflower seed expeller. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% crude lecithins — 2% soap stocks. It may be rumen protected.	No	none	--	Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.19.3) this product (2.19.6) is classified as "feed only".	FO
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.	No	none	--	Co-product of oil production. No information or indications on use in human food.	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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. Only when produced at an integrated crushing and refining site, the product may contain up to — 1% of the sum of used bleaching earth and filter aid (e.g. diatomaceous earth, amorphous silicates and silica, phyllosilicates and cellulosic or wood fibres) — 1,3% crude lecithins — 2% soap stocks. Maximum crude fibre: 27,5% in the dry matter. It may be rumen protected.	No	none	--	Due to the possible presence of processing aids and the availability of an identical product without processing aids (2.19.4) this product (2.19.7) is classified as "feed only".	FO
2.20.1	Vegetable fats and oils, edible	Oil and fat obtained from oilseeds or oil fruits (excluding castor oil from the ricinus plant), it may be degummed, refined and/or hydrogenated.	No	A036N, vegetable fats and oils, edible	The group includes any type of Vegetable fats and oils, edible. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Identical products for feed and food	NFO
3.11.1	Peas (dry seeds)	Garden peas (dry) (Pisum sativum L. (any subspp. And var.)) for animal feed	No	A013J, garden peas (dry)	Pulses (dried legume seeds) from the plant classified under the species Pisum sativum L. (any subspp. And var.), commonly known as Garden peas (dry) or Green peas (dry) or Mangetout or Sugar peas (dry) or Snow peas (dry). The part consumed/analysed is not specified.	Identical products for feed and food	NFO
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, 0,5% antiscaling agents, 2% sulphate and 0,25% sulphite.	No	AO33V Sugar beet molasses	The group includes any type of molasses obtained from Sugar beet. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Identical products for feed and food, apart from the process aids. An internet search indicated that the use of beet molasses as food is very limited due to the (high) content of minerals which makes the product less palatable for humans	FO
4.1.5	(Sugar) beet – molasses, partially desugared and/or de-betainized	Product obtained after further extraction using water of sucrose and/or betaine from sugar beet molasses. May contain up to 2% sulphate and 0,25% sulphite.	No	none	--	No identical product for food applications found. An internet search indicated that the use of beet molasses as food is very limited due to the (high) content of minerals which makes the product less palatable for humans. This is presumably even more because of the further processing of this molasses. May contain processing aids.	FO
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.	Yes	none	--	No food applications found. May contain processing aids.	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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.	No	none	--	No food applications found. May contain processing aids.	FO
4.8.1	Potatoes	Potatoes (Solanum tuberosum L. subsp. Tuberosum) for animal feed	No	A00ZT, potatoes	Edible tubers from the plant classified under the species Solanum tuberosum L. subsp. Tuberosum, commonly known as Potatoes. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
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.	Yes	none	--	Co-product of potato processing. Despite the fact that potatoes are sometimes consumed without removing the peel, peelings are not regarded as common food ingredients.	FO
4.8.8	Potato pulp	Product of the manufacture of potato starch consisting of extracted ground potatoes.	Yes	none	--	Co-product of starch production. No information or indications on use in human food.	FO
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. May contain collectively up to 1% methanol, ethanol and propan-2-ol, on an anhydrous basis.	No	A01QE, citrus fruit peel	The group includes any type of citrus fruit peel. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Citrus fruit peel (A01QE) is part of citrus pulp, but the latter fraction also contains the fibrous inner contents of citrus fruit remaining after juice production. Hence, these two are not similar products. May contain processing aids.	FO
6.3.1	Cereals straw	Straw of cereals.	No	none	--	not edible for humans	FO
6.6.1	Grass, field dried, [Hay]	Species of any grass, field dried.	No	none	--	not edible for humans	FO
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.	No	none	--	Not used for human food	FO
6.10.1	Lucerne; [alfalfa]	Medicago sativa L. and Medicago var. Martyn plants or parts thereof.	No	A0D6Y Alfalfa infusion leaves A00SH Alfalfa sprouts	Infusion materials from leaves and herbs of the plant classified under the species Medicago sativa L., commonly known as Lucerne infusion leaves or Alfalfa infusion leaves. The part consumed/analysed is not specified. Sprouts from the plant classified under the species Medicago sativa subsp. sativa L., commonly known as Alfalfa sprouts or Lucerne sprouts. The part consumed/analysed is not specified.	Alfalfa leaves (dried, infusion) and sprouts (fresh) are used as human food. There are no indications that lucerne (as roughage) is presently used in human food. This may change in the future (e.g. Mielmann, 2013)	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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.	No	A0D6Y Alfalfa infusion leaves A00SH Alfalfa sprouts	Infusion materials from leaves and herbs of the plant classified under the species Medicago sativa L., commonly known as Lucerne infusion leaves or Alfalfa infusion leaves. The part consumed/analysed is not specified. Sprouts from the plant classified under the species Medicago sativa subsp. sativa L., commonly known as Alfalfa sprouts or Lucerne sprouts. The part consumed/analysed is not specified.	Alfalfa leaves (dried, infusion) and sprouts (fresh) are used as human food. There are no indications that lucerne meal is presently used in human food. This may change in the future (e.g. Mielmann, 2013)	FO
6.11.1	Maize silage	Ensiled plants or parts thereof of Zea mays L. ssp. Mays.	No	none	--	Not used for human food	FO
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, 0,5% antiscaling agents, 3,5% sulphate and 0,25% sulphite.	No	A033Y, sugar cane molasses	The group includes any type of molasses obtained from Sugar cane. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Identical products for feed and food. Cane molasses is preferred for human food above beet molasses. A large variety of cane molasses is offered for use as human food. May contain processing aids and therefore regarded as "feed only" product	FO
8.17.1	Whey/whey powder	Product of cheese, quark or casein manufacturing or similar processes. – Concentration or drying may be applied. Where specifically prepared as feed material, may contain: — up to 0,5% phosphates e.g. polyphosphates (e.g. sodium hexametaphosphate), diphosphates (e.g. tetrasodiumpyrophosphate), used to decrease the viscosity and to stabilise protein during processing; — up to 0,3% inorganic acids: sulphuric acid, hydrochloric acid, phosphoric acid, used for pH adjustments in many stages of production processes; — up to 0,5% akali e.g. sodium, potassium, calcium, magnesium hydroxides, used for pH adjustments in many stages of production processes; — up to 2% free-flowing agents e.g. silicium dioxide, penta-sodium-triphosphate, tri-calcium-phosphate, used to improve powder flowing properties	Yes/No	A02PN, whey powder; A0EZB, whey	A02PN: The group includes any type of Whey powder. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity. A0EZB: The group includes any type of whey, i.e. the liquid phase remaining after milk has been curdled and strained, for example during the cheese production process. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity. milk	Identical products for feed and food. When the product contains process aids as specified in the description of feed materials, it can be regarded as a "feed only" product.	NFO With processing aids FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
8.18.1	Delactosed whey powder	hey from which the lactose has been partly removed. Otherwise identical to description of 8.17.1 above	Yes/No	A02PN, whey powder; A0EZB, whey	See 8.17.1	See 8.17.1	NFO With processing aids FO
11.1.1	Calcium carbonate; [Limestone]	Product obtained by grinding sources of calcium carbonate, such as limestone or by precipitation from acid solution.	No	none	--	Calcium carbonate (E170) is commonly used for the fortification of food products	NFO
11.4.1	Sodium chloride	Sodium chloride (NaCl) or product obtained by evaporative crystallisation from brine (saturated or depleted in another process) (vacuum salt) or evaporation of seawater (marine salt and solar salt) or grinding rock salt.	No	none	--	Sodium chloride is commonly used in a large number of food products	NFO
12.3.1	Vinasses – [condensed molasses soluble] -	Co-product derived from the industrial processing of musts/worts issued from microbial fermentation processes such as alcohol, organic acids or yeast manufacture. They are composed of the liquid/paste fraction obtained after the separation of the fermentation musts/worts. They may also include dead cells and/or parts (6) thereof of the fermentation micro-organisms used. The substrates are mostly of vegetable origin such as molasses, sugar syrup, alcohol, distillery residues, cereals and products containing starch, fruit juice, whey, lactic acid, sugar, hydrolysed vegetable fibres and fermentation nutrients such as ammonia or mineral salts.	No	none	--	Co-product of microbial fermentation. No information or indications on use in human food. Use in food unlikely because of high mineral content.	FO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
13.1.1	Products from the - bakery and pasta - industry	Products obtained during and from the production of bread, biscuits, wafers or pasta. They may be dried.	No	e.g. A0BX1 bakery products A007D pasta and similar products	The group includes products of the bakery industry. The part considered is by default the whole sold or prepared unit or a portion homogeneously representing the whole. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity. The category includes any type of pasta and similar products, otherwise known in some regions under the name of noodles. By default it is not defined if the food items belonging to this group are cooked or not; therefore in case of cooked products (e.g. boiled pasta), the cooking method should be reported with additional facet descriptors. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	This group of products comprises (parts of) food products, e.g. bread meal, biscuit meal, with properties suited for human consumption	NFO
13.6.1	Acid oils from chemical refining	Product obtained during the deacidification of oils and fats of vegetable or animal origin by means of alkali, followed by an acidulation with subsequent separation of the aqueous phase, containing free fatty acids, oils or fats and natural components of seeds, fruits or animal tissues such as mono- and diglycerides, crude lecithin and fibres.	No	none	--	Use of acid oils in food is unlikely because these comprise the fractions that hamper consumer acceptance of fats and oils and are removed by deacidification.	FO
13.6.5	Fatty acid distillates from physical refining	Product obtained during the deacidification of oils and fats of vegetable or animal origin by means of distillation containing free fatty acids, oils or fats and natural components of seeds, fruits or animal tissues such as mono- and diglycerides, sterols and tocopherols.	No	none	--	Use of fatty acid distillates in food is unlikely because these comprise the fractions that hamper consumer acceptance of fats and oils and are removed by deacidification.	FO
1.1.1	Barley grain	Barley grains (Hordeum vulgare L.) for animal feed	No	A000P, barley grains	Cereal grains from the plant classified under the species Hordeum vulgare L., commonly known as Barley grains. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.2.1	Maize grain	Grains of Zea mays L. ssp. mays. It may be rumen protected.	No	A000T, maize grain	Cereal grains from the plant classified under the species Zea mays L. subsp. mays, commonly known as Maize grain or Corn grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO

Number EU Catalogue	Product name	Description feed material Catalogue	Liquid co-product	Matching food MTX	Description FoodEx2	Considerations	Class
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 oil extraction of maize germs. Other products derived from starch and from the refining or fermentation of starch products may be added.	Yes/No	none	-	Co-product with poorly specified and variable composition. No information or indications on use in human food.	FO
1.4.1	Oat grain	Grains of Avena sativa L. and other cultivars of oats	No	A000G, oat grain	Cereal grains from the plant classified under the species Avena sativa L., commonly known as Oat grain or Cultivated oat. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.4.6	Oat hulls	Product obtained during dehulling of oat grains.	No	none	--	Oat hulls gain increasing interest as fibre source for human food, e.g. to increase fibre content and reduce energy density. https://www.dieetwebshop.nl; BAKERpedia.com	NFO
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.	No	A0F6P, rice bran	The group includes any type of bran from rice grains milling process. The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity	Rice bran is increasingly used as (functional) food ingredient in a variety of food products, primarily in Asia (Gul et al., 2015; Bodie et al., 2019).	NFO
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.	No	none	--	Rice bran without supplemented calcium carbonate (1.6.10) is available for food applications. Therefore product 1.6.11 with processing aids is regarded as "feed only" product.	FO
1.7.1	Rye grain	Grains of Secale cereale L.	No	A001K	Cereal grains from the plant classified under the species Secale cereale L., commonly known as Rye grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.10.1	Triticale grain	Grains of Triticum × Secale cereale L. Hybrid	No	A001V	Cereal grains from the plant classified under the genus x Triticosecale Wittm. ex A. Camus., commonly known as Triticale grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
1.11.1	Wheat grains	Grains of Triticum aestivum L., Triticum durum Desf. and other wheat cultivars. It may be rumen protected.	No	A001N, Common wheat grain	Cereal grains from the plant classified under the species Triticum aestivum L., commonly known as Common wheat grain. The part consumed/analysed is not specified.	Identical products for feed and food	NFO
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.	No	A004P, wheat bran	The group includes bran from any type of wheat (Triticum spp.). The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity.	Large overlap between products for feed and food. Wheat bran for food may contain (a larger part) part of endosperm, although the food product also acknowledges heterogeneity.	NFO

3.3 Summary of the results

In Table 6 below the results are summarized.

Table 6 *Feed materials selected on the basis of annual usage (volume) in animal feed and practical relevance in the Netherlands with classification as "feed only" (FO) or "not feed only" (NFO).*

Number EU Catalogue	Name	FO/NFO	Number EU Catalogue	Name	FO/NFO
1.1.1	Barley grain	NFO	2.19.2	Sunflower seed expeller	NFO
1.2.1	Maize grain	NFO	2.19.3	Sunflower seed meal	FO
1.2.9	Maize gluten feed (liguid or dry)	FO	2.19.4	Sunflower seed meal, dehulled	FO
1.4.1	Oat grain	NFO	2.19.6	Sunflower seed meal feed	FO
1.4.6	Oat hulls	NFO	2.19.7	Sunflower seed meal feed, dehulled	FO
1.6.10	Rice bran	NFO	2.20.1	Vegetable fats and oils, edible	NFO
1.6.11	Rice bran with calcium carbonate	FO	3.11.1	Peas (dry seeds)	NFO
1.7.1	Rye grain	NFO	4.1.4	(Sugar) beet molasses	FO
1.10.1	Triticale grain	NFO	4.1.5	(Sugar) beet - molasses, partially desugared and/or debetainized	FO
1.11.1	Wheat grains	NFO	4.1.8	Pressed (sugar) beet pulp (liguid)	FO
1.11.7	Wheat bran	NFO	4.1.10	Dried (sugar) beet pulp	FO
1.11.16	Wheat gluten feed (liguid or dry)	FO	4.8.1	Potatoes	NFO
1.11.19	Liquid wheat starch (liguid)	FO	4.8.3	Potato peelings, steamed (liguid)	FO
1.11.22	Wheat yeast concentrate (liguid)	FO	4.8.8	Potato pulp (liguid)	FO
1.12.11	Distillers' dried grains and solubles	FO	5.13.2	Citrus pulp, dried	FO
1.12.12	Brewers' grains (liguid or dry)	FO	6.3.1	Cereals straw	FO
2.8.2	Linseed expeller	NFO	6.6.1	Grass, field dried, [Hay]	FO
2.8.4	Linseed expeller feed	FO	6.6.3	Grass, herbs, legume plants, [green forage]	FO
2.12.1	Palm kernel - expeller	FO	6.10.1	Lucerne; [Alfalfa]	FO
2.14.2	Rape seed - expeller	FO	6.10.5	Lucerne meal; [Alfalfa meal]	FO
2.14.6	Rape seed - expeller feed	FO	6.11.1	Maize silage	FO
2.14.3	Rape seed meal	FO	7.6.1	(Sugar) cane molasses	FO
2.14.7	Rape seed meal feed	FO	8.17.1	Whey/whey powder (liguid or dry) (with processing aids)	NFO (FO)
2.18.1	Toasted soya (beans) (if rumen protected)	NFO (FO)	8.18.1	Delactosed whey/delactosed whey powder (liquid or dry) (with processing aids)	NFO (FO)
2.18.2	Soya (bean) expeller	NFO	11.1.1	Calcium carbonate; [Limestone]	NFO
2.18.3	Soya (bean) meal (if rumen protected)	NFO (FO)	11.4.1	Sodium chloride	NFO
2.18.4	Soya (bean) meal, dehulled (if rumen protected)	NFO (FO)	12.3.1	Vinasses (condensed molasses soluble)	FO
2.18.5	Soya (bean) hulls	FO	13.1.1	Products from the - bakery and pasta - industry	NFO
2.18.13	Soya (bean) meal feed	FO	13.6.1	Acid oils from chemical refining	FO
2.18.14	Soya (bean) meal feed, dehulled	FO	13.6.5	Fatty acid distillates from physical refining	FO

From the list of feed materials, approximately two third was classified as "feed only". Apart from the roughages, these "feed only" products are all co-products of food production and processing. Due to the restricted scope, the list in Table 6 is not an exclusive list of all "feed only" products. Feed materials with annual usage less than 50 kton are not included in this study and require a case by case evaluation.

4 Discussion

Regulation (EC) No. 396/2005 sets maximum residue limits (MRLs) for pesticide residues in food and feed of plant origin. These MRLs do not apply to products or parts of products that by their characteristics or nature, are used exclusively as animal feed ingredients ("feed only" products). The regulation does not further define these products. The aim of this study was to propose a list of "feed only" products, based on objective criteria and a transparent approach. Previously, both NVWA and the feed industry used a list with a limited number of "feed only" materials, but these were not freely available and considerations for inclusion of feed materials on these lists were not published.

In the present study, the EU Catalogue of feed materials (Regulation (EC) No 68/2013) was used as list of animal feed materials. This list is officially adopted in the EU. The Catalogue contains over 650 feed materials, including a large number of materials without relevant use in the Netherlands. To focus on the most relevant feed materials, a selection was made of feed materials with annual usage above 50 kton based on trade by SecureFeed members in the Netherlands. Although the actual volumes of use were not disclosed, Table 3 provides a list of feed materials matching this criterion. The usage of data of SecureFeed members would comprise over 85% of the Dutch trade and use of feed materials (SecureFeed, personal communication). We are not aware of any other database that could be used to provide this information at adequate level of detail, i.e. for individual feed materials as classified in the EU feed Catalogue.

The EFSA FoodEx2 database was used as a first reference to assess whether the feed materials in this study are also used in human food. Indeed for a number of products the same or a largely similar product was found in FoodEx2. Unfortunately, the description of food products is often broad and not very specific. In addition, the same terms may have different meaning for food and feed. This hampers the comparison with feed products. For example wheat bran for food (code A004P) is described as "The group includes bran from any type of wheat (Triticum spp.). The part consumed/analysed is by default the whole or a portion of it representing the observed heterogeneity". It is assumed that this description primarily refers to a specific part of the wheat kernel, i.e. the hard outer layers of cereal grain, consisting of the combined aleurone and pericarp. Wheat bran for feed (1.11.7) is described as "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." Hence, this is a broader defined product of which the botanically defined bran is the major component. Thus for the classification of the feed material as "feed only" consideration was needed whether the product was identical or similar to food products and whether the nature of the feed material would prevent the use as human food. In this particular case, in addition to the large similarity it was considered that a large variety of cereal grain fractions is used for bakery products. Thus wheat bran was considered as "not feed only". In contrast, wheat gluten feed was classified as "feed only" product despite the fact that it is derived from cereal grain of which the complete kernel is consumed as wholemeal in food products. Thus, wheat gluten feed does not contain components that are not suited for human consumption. However, because of the specific, variable and poorly defined composition and previous processing of this co-product from the manufacture of wheat starch and gluten, it is as such considered as unsuited for human food.

For a number of products no reference to a similar food product was made in FoodEx2, while it was anticipated that some of these materials are also used in human food. Therefore, an additional search was conducted into literature and on the internet to obtain additional information about the potential use in human food. It was observed that a number of products were actually used in e.g. (industrial) bakery products and/or offered for human consumption. Examples are provided in Table 4. This information was used to support classification of a product as "not feed only". In addition, scientific literature provided information on ongoing research to make (increasing) use of plant derived material for food applications in the future. Examples are provided in Table 4, such as rapeseed protein. The information was not considered adequate to classify a feed material as "not feed only" when no clear indications for substantial present use as human food was found. However, it does indicate that the present classification e.g. as "not feed only"

may be transient and may need to be revised in the near future when properties that limit or prevent use as human food can be removed.

The MRLs for pesticides apply to specific parts of the crops which are described in the product definitions of the Pesticides Regulation. If certain parts of the crops are not included in the product definition this might be because these parts are considered not fit for human consumption. Nonetheless, initiated by the circular economy, new food applications may have been developed for these parts. In this study only one product (2.18.5, soya (bean) hulls) fell outside the product definition of the Pesticides Regulation. For this product no food application could be found in the EFSA FoodEx2 database or internet search.

All feed materials which may contain processing aids and for which identical "feed materials without chemical impurities" are described in the feed Catalogue are classified as "feed only" in this study. This is because the (potential) chemical impurities in these products cannot be regarded as "technically unavoidable" due to the availability of the product without chemical impurities. The description in the feed Catalogue however does not explicitly state that process contaminants are present in a specific feed material. It only mentions "may be present". It is recommended to further refine the description in the EU Catalogue of feed materials at this point.

MRLs do not apply to products or parts of products that by their characteristics or nature, are used exclusively as animal feed ingredients until separate MRLs are set in the specific category 1200000. At present, category 120000 is empty. Consequently, when accepted by the competent authorities, no MRLs apply for the "feed only" products summarized in Table 6 as a legal basis for official control. Therefore, we recommend to use this report as a basis for discussion at EU level to include "feed only" products in category 120000 and develop appropriate MRLs for these products. Until then, risk assessment should assure safety of animal feed materials in this respect.

5 Conclusions and recommendations

Sixty feed materials were evaluated to judge which products due to their characteristics or nature are exclusively used as ingredients for animal feed and hence can be regarded as "feed only" products. The evaluated feed materials are products with an annual use as animal feed above 50 kton in the Netherlands, and some plant derived feed materials with lower usage, milk products, mineral products, and products of fat and oil processing that were added on request of the NVWA because of their practical relevance.

The following criteria were used to classify products as "feed only" in this study:
- products which are not included in the EFSA Food FoodEx2 database for food, and for which no food application was found on internet using Google as search engine and the name of the product in combination with "food" in Dutch and English as search terms;
- products which (may) contain(s) processing aids according to the feed material Catalogue and for which an identical product without processing aids is described in the feed materials Catalogue;
- (milk) products specifically prepared as feed material and containing processing aids.

On the basis of these criteria 42 out of 60 products were classified as "feed only" These "feed only" products are roughages and co-products of food production and processing. An overview of the products and their classification is included in Table 6.

Due to the restriction in the scope, Table 6 does not represent an exclusive list of all "feed only" products in the Netherlands. A large number of feed materials with annual usage less than 50 kton was not included in this study and need to be evaluated on a case by case basis. It is recommended to also have a systematic evaluation of feed materials with annual usage less than 50 kton.

The classification as "feed only" or "not feed only" may change over time because of technological and societal developments and by specification in EU guidance documents or legislation. It is recommended to regularly evaluate and update the list of "feed only" products in Table 6. Finally it is recommended to include "feed only" products in category 1200000 of Regulation (EC) 365/2005, specifically aimed for this purpose, and develop appropriate MRLs to facilitate official control of these feed materials based on a harmonized approach in the EU.

Disclaimer
Wageningen Food Safety Research (WFSR), commissioned by the Dutch Food and Consumer Product Safety Authority (NVWA), has compiled a list of animal feed products with a "feed only" status (not intended for human consumption). No rights can be derived from this list. The NVWA reserves the right to deviate from the provisions/statements of this report. The list of "feed only" products in this report is not exhaustive. It includes the most common products at the time of publication, based on information from sources consulted by WFSR. The report and the list provide no guarantees for the future.

If products designated as 'feed only' are used in human food after publication of this report, these products lose their "feed only" status. Products from the "feed only" list may also receive a different status due to legislative changes, recommendations, guidelines or changed policy from the European Commission. The report does not have international status. It represents a Dutch perspective. Other European member states may have different perspectives. The NVWA will not mediate in any disputes with other EU member states. Companies are responsible for verifying the approach followed by other European member states themselves.

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Annex 1 Chemical impurities in feed materials with an annual use above 50 kton

For several feed materials specific maximum contents of chemical impurities resulting from their manufacturing process and from processing aids are set in the EU Catalogue of feed materials (Commission Regulation (EU) No 68/2013 on the Catalogue of feed materials). In the tables below these maximum contents of chemical impurities are summarized for the feed materials with an annual use above 50 kton.

Table A1.1 *Maximum content of chemical impurities in cereal grains (category 1 in the Catalogue) with an annual use above 50 kton.*

Number EU Catalogue	Name	calcium carbonate[1]	dimethyl polysiloxane[3]	enzymes	bentonite[4]
1.6.11	Rice bran with calcium carbonate	23%			
1.12.12	Brewers' grains		0.30%	1.50%	1.80%

Table A1.2 *Maximum content of chemical impurities in oil seeds/fruits (category 2 in the Catalogue), with an annual use above 50 kton.*

Number EU Catalogue	Name	bleaching earth	filter aid	crude lecithins[5]	soap stocks
2.14.6	Rape seed expeller feed	1% (sum)	1% (sum)	1.30%	2.0%
2.14.7	Rape seed meal feed	1% (sum)	1% (sum)	1.30%	2.0%
2.18.13	Soya (bean) meal feed	1% (sum)	1% (sum)	1.30%	1.5%
2.18.14	Soya (bean) meal feed, dehulled	1% (sum)	1% (sum)	1.30%	1.5%
2.19.6	Sunflower seed meal feed	1% (sum)	1% (sum)	1.30%	2.0%

Table A1.3 *Maximum content of chemical impurities in tubers/roots (category 4 in the Catalogue) with an annual use above 50 kton.*

Number EU Catalogue	Name	sulphate[2]	sulphite	antifoaming agents	antiscaling agents
4.1.4	Sugar beet molasses	2%	0.25%	0.50%	0.50%
4.1.5	(Sugar) beet - molasses, partially desugared and/or debetainized	2%	0.25%		
4.1.8	Pressed (sugar) beet pulp	1%			
4.1.10	Dried (sugar) beet pulp	2%			

Table A1.4 *Maximum content of chemical impurities in other seeds/fruits (category 5 in the Catalogue) with an annual use above 50 kton.*

Number EU Catalogue	Name	methanol, ethanol, propan-2-ol
5.13.2	Citrus pulp, dried	1% (sum)

Table A1.5 *Maximum content of chemical impurities in other plants (category 7 in the Catalogue) with an annual use above 50 kton.*

Number EU Catalogue	Name	antifoaming agents	antiscaling agents
7.6.1	(Sugar) cane molasses	0.50%	0.50%

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