



# Specific Feed Safety Limits

GMP+ BA 1

Version EN: 17 December 2019

**GMP+ Feed Certification scheme**



## History of the document

Revision nr./ Date of approval	Amendment	Concerns	Final implementation date
0.0 / 01-01-2010	Previous versions can be found in <a href="#">History</a>		01-01-2010
0.1 / 17-03-2010			17-03-2010
0.2 / 29-09-2010			25-11-2010
0.3 / 14-11-2011			20-12-2011
0.4 / 01-10-2012			01-11-2012
0.4 / 11-2012			01-03-2013
05 / 03-2014			25-03-2014
0.6 / 06-2014			<p>Editorial changes: All editorial changes are listed in a <a href="#">factsheet</a></p> <hr/> <p>New title document</p> <p>Part B: Residue standards are moved to the GMP+ BA2 <i>Control of residues</i></p> <p>Par. 4.3 is moved to the Country Note BCN-NL1</p>
0.7 / 10-2015	<p>Changes in feed legislation:</p> <ul style="list-style-type: none"> <li>- maximum levels for arsenic, fluorine, lead, mercury, endosulfan and Ambrosia seeds</li> <li>- maximum level for hydrocarbons in Sunflower originating in or consigned from Ukraine</li> <li>- Radioactivity</li> </ul> <p>Trace elements Copper and Zinc: these elements are withdrawn from GMP+ BA1. Reference to the Community Register of feed additives applies.</p> <p>Pesticides: Octanol/water partition coefficient (log Pow)</p>	3	The new limits are already in use
		3	04.11.2015
		4	04.11.2015
0.8 / 12-2015	<p>Correction in the (Dutch and English version) group title of pesticides.</p> <hr/> <p>Removing of biogenic amines</p>	3	12.01.2016
0.9 / 09-2017	<p>Changes in feed legislation:</p> <ul style="list-style-type: none"> <li>- Part 3: Arsenic standard - Footnote no.16 is corrected.</li> <li>- Part 3: A new generic table for Pesticides is included.</li> <li>- Part 3: In the tables about "Pesticides which are not permitted in the EU (acc. Di 2002/32/EC)" an additional footnote (regarding Regulation 396/2005) is added.</li> <li>- Part 4 "Residue levels of pesticides in feeds" is fully updated.</li> </ul>	3	These are already in use
		4	

Revision nr./ Date of approval	Amendment	Concerns	Final implementation date
0.10 / 12-2017	The feed safety limits for Enterobacteriaceae are amended.	4	09.01.2018
0.11 / 03-2018	Due to changes in feed legislation the following is amended: - Part 3: maximum levels for lead, mercury and melamine. - Part 3: small correction in the feed safety limits for Enterobacteriaceae	3	These limits are already in use
0.12 / 11-2018	Changes in: - Plastics - Polyethylene - Radioactivity	3	13.12.2018
0.13 / 07-2019	New action limits for Mycotoxins Deoxynivalenol (DON), Zearalenon (ZEA) and Ochratoxin A (OTA)	3	17.09.2019
0.14 / 11-2019	Changes are: - due to feed legislation - the name of the undesirable substance "Hydrocarbons (C10-C40) – code C24" is replaced by "Mineral oil hydrocarbons - Nickel (C30): - Chapter 4 "Residue levels of pesticides in feeds	3  4	16.12.2019

# Index

<b>1. INTRODUCTION.....</b>	<b>5</b>
1.1. GENERAL .....	5
1.2. STRUCTURE OF THE GMP+ FEED CERTIFICATION SCHEME .....	5
1.3. INTRODUCTION TO THE SPECIFIC FEED SAFETY LIMITS.....	6
<b>2. GENERAL CONDITIONS.....</b>	<b>7</b>
<b>3 SUMMARY OF GMP+ PRODUCT STANDARDS FOR THE ANIMAL FEED SECTOR .....</b>	<b>8</b>
<b>4 RESIDUE LEVELS OF PESTICIDES IN FEEDS .....</b>	<b>79</b>
4.1 INTRODUCTION.....	79
4.1.1 LIST OF TERMS.....	79
4.2 THE ESTABLISHMENT OF AN MRL CONFORM REGULATION (EC) No. 396/2001.....	80
4.2.1 GENERAL .....	80
4.2.2 QUESTIONNAIRE FOR UNPROCESSED PRODUCTS .....	81
4.2.3 QUESTIONNAIRE FOR PROCESSED PRODUCTS .....	82
4.2.4 QUESTIONNAIRE FOR COMPOSITE PRODUCTS .....	84
4.2.5 EXCEPTIONS UNDER CONDITIONS IN REGULATION (EC) No. 396/2005 .....	85

# 1. Introduction

## 1.1. General

The GMP+ Feed Certification scheme was initiated and developed in 1992 by the Dutch feed industry in response to various more or less serious incidents involving contamination in feed materials. Although it started as a national scheme, it has developed to become an international scheme that is managed by GMP+ International in collaboration with various international stakeholders.

Even though the GMP+ Feed Certification scheme originated from a feed safety perspective, in 2013 the first feed responsibility standard has been published. For this purpose, two modules are created: GMP+ Feed Safety Assurance (focussed on feed safety) and GMP+ Feed Responsibility Assurance (focussed on responsible feed).

GMP+ Feed Safety Assurance is a complete module with standards for the assurance of feed safety in all the links of the feed chain. Demonstrable assurance of feed safety is a 'license to sell' in many countries and markets and participation in the GMP+ FSA module can facilitate this excellently. Based on needs in practice, multiple components have been integrated into the GMP+ FSA standards, such as requirements for a feed safety management system, for application of HACCP principles, to traceability, monitoring, prerequisites programmes, chain approach and the Early Warning System.

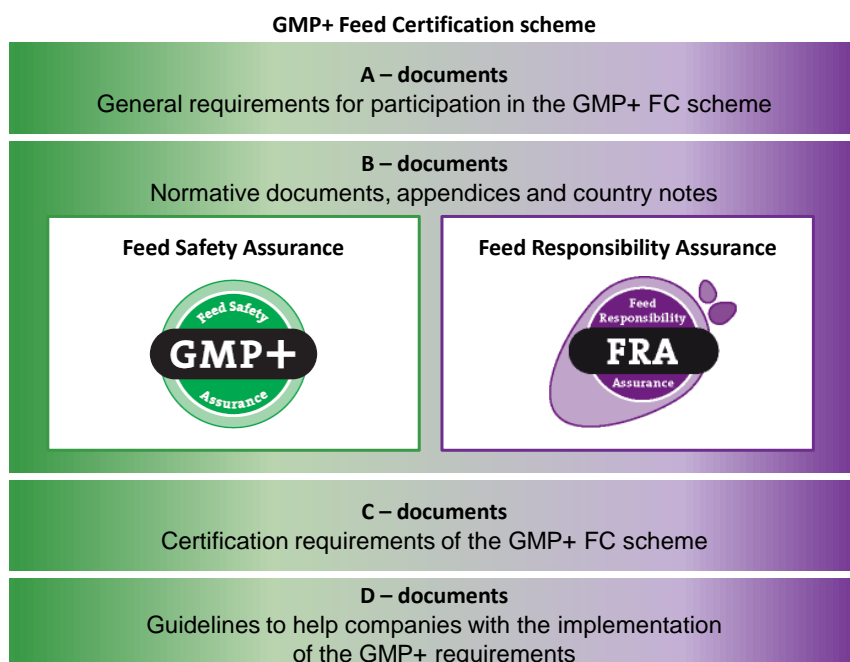
With the development of the GMP+ Feed Responsibility Assurance module, GMP+ International is responding to requests from GMP+ participants. The animal feed sector is confronted with requests to operate more responsible. This includes, for example, the sourcing of soy and fishmeal which are produced and traded with respect for humans, animals and the environment. In order to demonstrate responsible production and trade, a company can get certified for the GMP+ Feed Responsibility Assurance. GMP+ International facilitates via independent certification the demands from the market.

Together with the GMP+ partners, GMP+ International transparently lays down clear requirements in the Feed Certification scheme. Certification bodies are able to carry out GMP+ certification independently.

GMP+ International supports the GMP+ participants with useful and practical information by way of a number of guidance documents, databases, newsletters, Q&A lists and seminars.

## 1.2. Structure of the GMP+ Feed Certification scheme

The documents within the GMP+ Feed Certification scheme are subdivided into a number of series. The next page shows a schematic representation of the content of the GMP+ Feed Certification scheme:



All these documents are available via the website of GMP+ International ([www.gmpplus.org](http://www.gmpplus.org)).

This document is referred to as GMP+ BA1 *Specific Feed Safety Limits (previous Product Standards)* and is part of the GMP+ FSA module.

### 1.3. Introduction to the Specific Feed Safety Limits

There are references in the various GMP+ standards to the specific feed safety limits.

The specific feed safety limits included in this appendix are:

- a. the specific feed safety limits as laid down in the European Union feed legislation, or
- b. a number of product standards, as determined within the framework of the GMP+ FSA scheme in consultation with the subsequent links in the animal production chain.

**DISCLAIMER:** The GMP+ International has adopted this list in order to inform interested parties with respect to the standards in the legislation (European Union and additional GMP+ standards). The list will be regularly updated. The GMP+ International is not liable for any errors in this list.

## 2. General conditions

In arriving at the product standards a distinction has been made between action and rejection limits. The action limits for undesirable contaminants is appreciably lower than the rejection limit.

### Action limit:

A feasible limit agreed in consultation with the sector, supplier or customer. Where the **action limit** is exceeded an investigation must be carried out into the source of the contamination and measures must be taken to remove or limit the source of the contamination.

### Rejection limit:

A feasible limit agreed in consultation with the sector, supplier or customer. If the **rejection limit** is exceeded then the product is not suitable for use as a feed material or animal feed.

In the various GMP+ standards it is stated that the participant must ensure that deviations (in the product or process) from the requirements in this standard are recorded and controlled in order to prevent unintentional use or delivery of the product.

Product standards for mixes of feed materials (semi-manufactured product) which are marketed as such  
The product standards for the maximum level of undesirable substances is calculated proportionately from the product standard for the individual components. This calculation principle is also applied for the calculation of the product standard for pesticides for compound feeds (see section 4.2.4 question no.5).

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Microbiological: Other undesirable substances and products</b>						
M1	Antibacterial inhibition	- Feed materials  - Wet mixes	-	< 15 mm	GMP+	According to the 5-plate test MB003, derived from EG-4-plate test, product basis (RIVM report no. 206; Archiv für Lebensmittelhygiene 31 (1981) page 97-140.

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(4)</sup>	Source	Supplementary requirements	
<b>Microbiological</b>							
M3	Enterobacteriaceae	Animal by-products that are placed on the market as feed materials*		300 CFU/g	Commission Regulation (EU) 142/2011, annex X, chapter 1	n = 5, c = 2, m = 10, M = 300 in 1 g <sup>14</sup> These standards apply to: samples of the final products taken during or on withdrawal from storage at the processing plant. * this microbiological standard shall not apply to rendered fats and fish oil from the processing of animal by-products, when the processed animal protein, which is obtained during the same processing, is subject to sampling to ensure compliance with those standards.  Further, for imports from outside the European Union (EU) specific requirements may apply. See Regulation (EU) 142/2011 for more information.	
		Processed petfood *				Commission Regulation (EU) 142/2011, annex XIII, chapter 2	
		- Dogchews and processed petfood, with the exception of canned petfood  - Canned petfood  Raw petfood		300 CFU/g  Canned petfood which has been subjected to heat treatment with a Fc value of at least 3  5.000 CFU/g	Commission Regulation (EU) 142/2011, annex XIII, chapter 2  Commission Regulation (EU) 142/2011, annex XIII, chapter 2	n = 5, c = 2, m = 10, M = 300 in 1 g <sup>14</sup> Samples are taken during production and/or during storage (before dispatch)  n = 5, c = 2, m = 10, M = 5.000 in 1 g <sup>14</sup> Samples are taken during production and/or during storage (before dispatch)  * Further, for imports from outside the European Union (EU) specific requirements may apply. See Regulation (EU) 142/2011 for more information.	

[14] n = number of samples to be tested; m = threshold value for the number of bacteria; the result shall be considered satisfactory if the number of bacteria in all samples does not exceed m; M = maximum value for the number of bacteria; the result shall be considered unsatisfactory if the number of bacteria in one or more samples is M or more; and c = number of samples the bacterial count of which may be between m and M, the sample shall still be considered acceptable if the bacterial count of the other samples is m or less.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Microbiological: Microbiological contamination</b>						
M4a	Salmonella	Consumption chick feed: end products and feed materials for:			GMP+	
		- Top breeding consumption chicks	-	0+% <sup>20</sup> (approaching 0%)		
		- Breeding increase consumption chicks	-	0+% <sup>20</sup> (approaching 0%)		
		- Increase consumption chicks	-	0+% <sup>20</sup> (approaching 0%)		
		- Consumption chicks	-	0+% <sup>20</sup> (approaching 0%)		
Laying poultry feed: end products and feed materials for:			GMP+			
- Top breeding laying poultry	-	0+% <sup>20</sup> (approaching 0%)				
- Raising increase laying poultry	-	0+% <sup>20</sup> (approaching 0%)				
- Increase laying poultry	-	0+% <sup>20</sup> (approaching 0%)				
- Laying-hens and breeding hens	1%	0+% <sup>20</sup> (approaching 0%) for S. enteritidis and S. typhimurium				
Turkey feed: end products and feed materials for:			GMP+			
- Raising increase turkeys	-	0+% <sup>20</sup> (approaching 0%)				
- Increase turkeys	-	0+% <sup>20</sup> (approaching 0%)				
- Consumption turkeys	-	0+% <sup>20</sup> (approaching 0%)				
		Other animal feeds, feed materials and wet mixes intended for cattle farms (except for poultry feeds).	-	Absent in 25 gr	GMP+	
		From animal by-products derived products with the exception of canned petfood	-	Absent in 25 gr	Commission Regulation (EU) 142/2011, annex XIII, chapter 2	n = 5, c = 0, m = 0, M = 0 <sup>14</sup>

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Microbiological: Microbiological contamination</b>						
		From animal by-products derived canned petfood		-	Commission Regulation (EU) 142/2011, annex XIII, chapter 2	Canned petfood which has been subjected to heat treatment with a Fc value of at least 3
M4b	Salmonella preservation determined through pH	<ul style="list-style-type: none"> <li>- Feed materials for delivery to cattle farms, and</li> <li>- Wet mixes for delivery to livestock farmers on the basis of: <ul style="list-style-type: none"> <li>- Spontaneous lactic acid fermentation</li> <li>- Add organic acids</li> <li>- Add inorganic acids</li> </ul> </li> </ul>	-	Maximum pH for guarantee:  4.5  4  3,5	GMP+	If preservation can be achieved at a higher pH then this should be supported with data.  These norms do not apply if the products are supplied at a temperature of at least 60°C and the supplier is demonstrably informed of the storage conditions.  The absence of Salmonella can also be shown in heat-treated wet mixes and feed materials (<13% moisture) through compliance with the norms for Enterobacteriaceae.

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[20] **Explanation of 0<sup>+</sup>:** this norm does not apply to each individual sample. In a particular period of time the Salmonella incidence at company level should approach 0% (= 0<sup>+</sup>).

[14] n = number of samples to be tested; m = threshold value for the number of bacteria; the results will be considered to be satisfactory if the number of bacteria in none of the samples is greater than m, M = maximum value for the number of bacteria; the result shall be considered unsatisfactory if the number of bacteria in one or more samples is M or more; c = number of samples for which the bacteria count gives a result between m and M and where the sample is still considered acceptable if the result of the bacteria for the other samples is not higher than m.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Microbiological: Microbiological contamination						
M5a	Moulds	Feed materials	10 <sup>6</sup> CFU/g			In the <a href="#">TNO report "Norm for fungal load in animal feed (D4.16)"</a> you can read the foundation of the new standards and the suggestions for analysis methods.
M5b	Yeast	Feed materials ≤ 12% moisture content or aw-value ≤ 0.95	10 <sup>6</sup> CFU/g			
		Feed materials ≥ 12% moisture content or aw-value ≥ 0.95	-			

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Mycotoxin</b>						
C1	Aflatoxin B1	Feed materials intended for (direct) delivery to dairy farmers	-	0.005 mg/kg	GMP+	
		Feed materials	-	0.02 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	
		Complementary and complete feed with the exception of:	-	0.01 mg/kg		
		- compound feed for dairy cattle and calves, dairy sheep and lambs, dairy goats and kids, piglets and young poultry animals.	-	0.005 mg/kg		
- compound feed for cattle (except dairy cattle and calves), sheep (except dairy sheep and lambs), goats (except dairy goats and kids), pigs (except piglets) and poultry (except young animals).	-	0,02 mg/kg				

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C2	Aldrin Dieldrin  (Singly or combined expressed as dieldrin)	Feed materials and compound feed, with the exception of:  - fats and oils, - compound feed for fish	-	0.01 mg/kg  0,1 mg/kg 0.2 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	Maximum level for aldrin and dieldrin, singly or combined, expressed as dieldrin.

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Heavy metals						
C3	Arsenic <sup>16</sup>	<p>Feed materials, with the exception of:</p> <ul style="list-style-type: none"> <li>- meal made from grass, from dried lucerne and from dried clover, and dried sugar beet pulp and dried molasses sugar beet pulp,</li> <li>- palm kernel expeller;</li> <li>- peat; leonardite;</li> <li>- phosphates and calcareous marine algae;</li> <li>- calcium carbonate; calcium and magnesium carbonate <sup>11</sup>; calcareous marine shells;</li> <li>- magnesium oxide and magnesium carbonate</li> <li>- fish, other aquatic animals and products derived thereof,</li> <li>- seaweed meal and feed materials derived from seaweed</li> </ul> <p>Iron particles used as tracer</p> <p>Feed additives belonging to the functional group of compounds of trace elements except:</p> <ul style="list-style-type: none"> <li>- cupric sulphate pentahydrate; cupric carbonate; <del>di-copper dicopper</del>; chloride trihydroxide; ferrous carbonate; dimanganese chloride trihydroxide;</li> <li>- zinc oxide, manganous oxide and cupric oxide</li> </ul> <p>Complete feed, with the exception of:</p> <ul style="list-style-type: none"> <li>- complete feed for fish and fur animals.</li> <li>- complete feed for pet animals containing fish, other aquatic animals and products derived thereof and/or seaweed meal and feed materials derived from seaweed.</li> </ul>	-	<p>2 mg/kg</p> <p>4 mg/kg</p> <p>4 mg/kg<sup>15</sup></p> <p>5 mg/kg<sup>15</sup></p> <p>10 mg/kg</p> <p>15 mg/kg</p> <p>20 mg/kg</p> <p>25 mg/kg<sup>15</sup></p> <p>40 mg/kg<sup>15</sup></p> <p>50 mg/kg</p> <p>30 mg/kg</p> <p>50 mg/kg</p> <p>100 mg/kg</p> <p>2 mg/kg</p> <p>10 mg/kg<sup>15</sup></p> <p>10 mg/kg<sup>15</sup></p>	Commission Regulation (EU) No <del>2015/186</del> 2019/1869 amending Annex I to Directive 2002/32/EC	

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
		Complementary feed, with the exception of:  - mineral feed	-  -	4 mg/kg  12 mg/kg		
		- complementary feed for pet animals containing fish, other aquatic animals and products derived thereof and/or seaweed meal and feed materials derived from seaweed.  - long-term supply formulations of feed for particular nutritional purposes with a concentration of trace elements higher than 100 times the established maximum content in complete feed.		10 mg/kg <sup>15</sup>  30 mg/kg		

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[15] At the request of the competent authorities the responsible operator must carry out an analysis to show that the level of inorganic arsenic is lower than 2 ppm. This analysis is especially important for the Hizikia fusiforme seaweed

[16] The maximum levels refer to the total level of arsenic.

[11] Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in ~~Commission Regulation (EU) No 575/2011 of 16 June 2011 on the European Catalogue of feed materials (OJ-L 159, 17.6.2011, p. 25)~~



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Other undesirable substances and products</b>						
C4	Hydrocyanic acid	Feed materials, with the exception of:	-	50 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	
		- linseed	-	250 mg/kg		
- linseed cakes	-	350 mg/kg				
- manioc products and almond cake.	-	100 mg/kg				
		Complete feed, with the exception of:	-	50 mg/kg		
		- complete feed for young chickens (< 6 weeks)	-	10 mg/kg		

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Heavy metals						
C6	Cadmium	Feed materials of vegetable origin	-	1 mg/kg	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	
		Feed materials of animal origin	-	2 mg/kg		
		Feed materials of mineral origin, with the exception of:		2 mg/kg		
		- phosphates	-	10 mg/kg		
		Feed additives, belonging to the functional group "Compounds of trace elements", with the exception of:		10 mg/kg		
		- cupric oxide, manganous oxide, zinc oxide and manganous sulphate-monohydrate	-	30 mg/kg		
		Feed additives belonging to the functional groups of binders and anti-caking agents	-	2 mg/kg		
		Premixtures	-	15 mg/kg <sup>2</sup>		
		Complementary feed with the exception of:		0,5 mg/kg		
		Mineral feed				
- containing < 7% phosphorus <sup>8</sup>	-	5 mg/kg				
- containing $\geq$ 7% phosphorus <sup>8</sup>	-	0,75 mg/kg per 1% phosphorus <sup>8</sup> , with a maximum of 7,5 mg/kg				
Complementary feed for pet animals	-	2 mg/kg				
Long-term supply formulations of feed for particular nutritional purposes with a concentration of trace elements higher than 100 times the established maximum content in complete feed.	-	15 mg/kg				
Complete feed with the exception of:		0,5 mg/kg				
- complete feed for cattle (except calves), sheep (except lambs) goats (except kids) and fish	-	1 mg/kg				
- complete feed for pet animals	-	2 mg/kg				

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[2] The maximum level established for premixtures takes into account the additives with the highest level of lead and cadmium and not the sensitivity of the different animal species to lead and cadmium. As provided in Article 16 of Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition (OJ L 268, 18.10.2003, p. 29), in order to protect animal and public health, it is the responsibility of the producer of premixtures to ensure that, in addition to compliance with the maximum levels for premixtures, the instructions for use on the premixture are in accordance with the maximum levels for complementary and complete feed.

[8] The % of phosphorus is relative to a feed with a moisture content of 12 %.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Salts						
C7	Chloride	<ul style="list-style-type: none"> <li>- Feed materials for delivery to livestock farms, and</li> <li>- Wet mixes for delivery to livestock farmers</li> </ul>	10 g/kg (dry matter)		GMP+	<p>If the action limit is exceeded then a warning or processing advice must be <b><u>demonstrably communicated</u></b> to the customer.</p> <p>Supply of additional water to the animals is also important to avoid health problems. More recommendations in the event of excess of the action limit can be found in GMP+ D4.13 <i>Salts in rations with wet feeds for fattening pigs and sows</i></p>

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C8	Campechlor (toxaphene) – sum of the indicators CHB 26, 50 and 62 <sup>22</sup>	Fish, other aquatic animals and products thereof with the exception of fish oil  - fish oi  Complete feed for fish	-  -  -	0.02 mg/kg  0.2 mg/kg  0.05 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[22] Numbering system according to Parlar, prefixed by either CHB or "Parlar":

- CHB 26: 2-endo,3-exo,5-endo,6-exo,8,8,10,10-octochlorobornane,
- CHB 50: 2-endo,3-exo,5-endo,6-exo,8,8,9,10,10-nonachlorobornane,
- CHB 62: 2,2,5,5,8,9,9,10,10-nonachlorobornane.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C9	Chlordane (sum of cis- en trans isomers and of oxychlordane expressed chlordane)	Feed materials and compound feed with the exception of:  - fats and oils	-  -	0.02 mg/kg  0.05 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C11	DDT (sum of DDT-, DDD- (or TDE-) and DDE-isomers, expressed as DDT)	Feed materials and compound feed with the exception of:  - fats and oils	-  -	0.05 mg/kg  0.5 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Other undesirable substances and products</b>						
C12	Prohibited Animal proteins (Restricted animal proteins)	Animal feeds for productive livestock	-	0	Regulation 999/2001, art. 7 and Appendix IV	See GMP+ BA 3: Negative list

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)(4)</sup>	Source	Supplementary requirements
<b>Chemical: Toxic substances</b>						
C13a	Dioxin <sup>18</sup> (sum of polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) expressed in World Health Organisation (WHO) toxic equivalents, using the WHO-TEFs (toxic equivalency factors, 2005))	Feed materials of plant origin with the exception of vegetable oils and their by-products	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg	Commission Regulation (EU) No <del>277/2012</del> and <del>744/2012</del> <del>2019/1869</del> amending Annex I and II to Directive 2002/32/EC	In the event of exceeding the action limit: Identification of source of contamination. Once source is identified, take appropriate measures, where possible, to reduce or eliminate source of contamination.
		Vegetable oils and their by-products	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg		
		Feed materials of mineral origin	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg		
		Feed materials of animal origin:				
		Animal fat including milk fat and egg fat	0,75 ng WHO-PCDD/F-TEQ/kg	1,50 ng WHO-PCDD/F-TEQ/kg		
		Other land animal products including milk and milk products and eggs and egg products.	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg		
		Fish oil	4,0 ng WHO-PCDD/F-TEQ/kg	5,0 ng WHO-PCDD/F-TEQ/kg		
		Fish, other aquatic animals and products derived thereof, with the exception of fish oil and hydrolysed fish protein containing more than 20% fat <sup>6</sup> and crustacean meal.	0,75 ng WHO-PCDD/F-TEQ/kg	1,25 ng WHO-PCDD/F-TEQ/kg		
		Hydrolysed fish protein containing more than 20% fat ; crustacean meal.	1,25 ng WHO-PCDD/F-TEQ/kg	1,75 ng WHO-PCDD/F-TEQ/kg		
						In the event of exceeding the action limit: In many cases it might not be necessary to perform an investigation into the source of contamination as the background level in some areas is close or above the action level. However, in cases where the action level is exceeded, all information, such as sampling period, geographical origin, fish species, etc., shall be recorded with a view to future measures to manage the presence of dioxins and dioxin-like compounds in the materials for animal nutrition.

	Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)</sup> (4)	Source	Supplementary requirements
		Feed additives belonging to the functional groups of binders and anti-caking agents (*)	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg		<p>In the event of exceeding the action limit: Identification of source of contamination. Once source is identified, take appropriate measures, where possible, to reduce or eliminate source of contamination.</p> <p>(*) The maximum level is also applicable to the feed additives belonging to the functional groups of substances for the control of radionuclide contamination and substances for reduction of the contamination of feed by mycotoxins which are also belonging to the functional groups of binders and anti-caking agents.</p>
		The feed additives kaolinitic clay, vermiculite, natrolite-phonolite, synthetic calcium aluminates and clinoptilolite of sedimentary origin, belonging to the functional groups of binders and anti-caking agents		0,75 ng WHO-PCDD/F-TEQ/kg		
		Feed additives belonging to the functional group of compounds of trace elements.	0,5 ng WHO-PCDD/F-TEQ/kg	1,0 ng WHO-PCDD/F-TEQ/kg		
		Premixes	0,5 ng WHO-PCDD/F-TEQ/kg	1,0 ng WHO-PCDD/F-TEQ/kg		
		Compound feeds with the exception of:	0,5 ng WHO-PCDD/F-TEQ/kg	0,75 ng WHO-PCDD/F-TEQ/kg		
		- compound feed for pet animals and fish	1,25 ng WHO-PCDD/F-TEQ/kg	1,75 ng WHO-PCDD/F-TEQ/kg		
		- compound feed for fur animals	-	-		<p>In the event of exceeding the action limit: In many cases it might not be necessary to perform an investigation into the source of contamination as the background level in some areas is close or above the action level.</p> <p>However, in cases where the action level is exceeded, all information, such as sampling period, geographical origin, fish species, etc., shall be recorded with a view to future measures to manage the presence of dioxins and dioxin-like compounds in the materials for animal nutrition.</p>
C13b	Sum of dioxins and dioxin-like PCBs <sup>18</sup> (sum of polychlorinated dibenzo- para-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs) expressed in World Health Organisation (WHO) toxic equivalents, using the WHO-TEFs (toxic	Feed materials of plant origin with the exception of vegetable oils and their by-products		1.25 ng WHO-PCDD/F-PCB-TEQ/kg		<p>(*) the maximum level is also applicable to the feed additives belonging to the functional groups of substances for the control of radionuclide contamination and substances for reduction of the contamination of feed by mycotoxins which are also belonging to the functional groups of binders and anti-caking agents.</p>
		Vegetable oils and their by-products		1.5 ng WHO-PCDD/F-PCB-TEQ/kg		

	Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)(4)</sup>	Source	Supplementary requirements	
	equivalency factors, 2005))	Feed materials of mineral origin		1,0 ng WHO-PCDD/F-PCB-TEQ/kg			
		Feed materials of animal origin:					
		- Animal fat including milk fat and egg fat			2,0 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Other land animal products including milk and milk products and eggs and egg products			1.25 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Fish oil			20,0 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Fish, other aquatic animals and products derived thereof with the exception of fish oil and fish protein hydrolysates containing more than 20% fat <sup>6</sup>			4,0 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Fish protein hydrolysates containing more than 20% fat			9,0 ng WHO-PCDD/F-PCB-TEQ/kg		
		The feed additives kaolinitic clay, vermiculite, natrolite-phonolite, synthetic calcium aluminates and clinoptilolite of sedimentary origin, belonging to the functional groups of binders and anti-caking agents (*)			1.5 ng WHO-PCDD/F-PCB-TEQ/kg		
		Feed additives belonging to the functional group of compound of trace elements.			1.5 ng WHO-PCDD/F-PCB-TEQ/kg		
		Premixtures			1.5 ng WHO-PCDD/F-PCB-TEQ/kg		
		Compound feed with the exception of:			1.5 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Compound feed for pet animals and fish			5,0 ng WHO-PCDD/F-PCB-TEQ/kg		
		- Compound feed for fur animals			-		

	Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)(4)</sup>	Source	Supplementary requirements
C13c	Dioxin-like PCBs <sup>18</sup> (sum of polychlorinated biphenyls (PCBs) expressed in World Health Organisation (WHO) toxic equivalents, using the WHO- TEFs (toxic equivalency factors, 2005)	Feed materials of plant origin with the exception of vegetable oils and their by-products	0.35 ng WHO-PCB-TEQ/kg			In the event of exceeding the action limit: Identification of source of contamination. Once source is identified, take appropriate measures, where possible, to reduce or eliminate source of contamination.
		Vegetable oils and their by-products	0.5 ng WHO-PCB-TEQ/kg			
		Feed materials of mineral origin	0.35 ng WHO-PCB-TEQ/kg			
		Feed materials of animal origin:				
		- Animal fat including milk fat and egg fat	0.75 ng WHO-PCB-TEQ/kg			In the event of exceeding the action limit: In many cases it might not be necessary to perform an investigation into the source of contamination as the background level in some areas is close or above the action level. However, in cases where the action level is exceeded, all information, such as sampling period, geographical origin, fish species, etc., shall be recorded with a view to future measures to manage the presence of dioxins and dioxin-like compounds in the materials for animal nutrition.
		- Other land animal products including milk and milk products and eggs and egg products	0.35 ng WHO-PCB-TEQ/kg			
		- Fish oil	11,0 ng WHO-PCB-TEQ/kg			
		- Fish, other aquatic animals and products derived thereof with the exception of fish oil and fish protein, hydrolysed, containing more than 20% fat <sup>6</sup>	2,0 ng WHO-PCB-TEQ/kg			
		- Fish protein, hydrolysed, containing more than 20% fat	5,0 ng WHO-PCB-TEQ/kg			
		Feed additives belonging to the functional groups of binders and anti-caking	0.5 ng WHO-PCB-TEQ/kg			
Feed additives belonging to the functional group of compounds of trace elements	0.35 ng WHO-PCB-TEQ/kg					

	Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)(4)</sup>	Source	Supplementary requirements
		Premixtures	0.35 ng WHO-PCB-TEQ/kg			
		Compound feed with the exception of:	0.5 ng WHO-PCB-TEQ/kg			
		- Compound feed for pet animals and fish,	2,5 ng WHO-PCB-TEQ/kg			In the event of exceeding the action limit: In many cases it might not be necessary to perform an investigation into the source of contamination as the background level in some areas is close or above the action level. However, in cases where the action level is exceeded, all information, such as sampling period, geographical origin, fish species, etc., shall be recorded with a view to future measures to manage the presence of dioxins and dioxin-like compounds in the materials for animal nutrition.
		- Compound feed for fur animals	-			
C13d	Non-dioxin-like PCBs (sum of PCB 28, PCB 52, PCB 101, PCB 138, PCB 153 and PCB 180 (ICES – 6))	Feed materials of plant origin		10 µg/kg (ppb)		(*) the maximum level is also applicable to the feed additives belonging to the functional groups of substances for the control of radionuclide contamination and substances for reduction of the contamination of feed by mycotoxins which are also belonging to the functional groups of binders and anti-caking agents.
		Feed materials of mineral origin		10 µg/kg (ppb)		
		Feed materials of animal origin:		10 µg/kg (ppb)		
		- Animal fat, including milk fat and egg fat		10 µg/kg (ppb)		
		- Other land animal products including milk and milk products and eggs and egg products		10 µg/kg (ppb)		
		- Fish oil		175 µg/kg (ppb)		
		- Fish, other aquatic animals and products derived thereof with the exception of fish oil and fish protein, hydrolysed, containing more than 20 % fat		30 µg/kg (ppb)		
		- Fish protein, hydrolysed, containing more than 20 % fat		50 µg/kg (ppb)		
		The feed additives kaolinitic clay, vermiculite, natrolite, phonolite, synthetic calcium aluminates and clinoptilolite of sedimentary origin belonging to		10 µg/kg (ppb)		

Contaminant	Product	Action limit <sup>(1)</sup> (4)	Rejection limit <sup>(1)(4)</sup>	Source	Supplementary requirements
	the functional groups of binders and anti-caking agents				
	Feed additives belonging to the functional group of compounds of trace elements		10 µg/kg (ppb)		
	Premixture		10 µg/kg (ppb)		
	Compound feed with the exception of:		10 µg/kg (ppb)		
	- compound feed for pet animals and fish		40 µg/kg (ppb)		
	- compound feed for fur animals		-		

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[4] **Upper-bound concentrations:** upper-bound concentrations are calculated on the assumption that all values of the different congeners below the limit of quantification are equal to the limit of quantification.

[5] Fresh fish and other aquatic animals directly delivered and used without intermediate processing for the production of feed for fur animals are not subject to the maximum levels, while maximum levels of 75 µg/kg product are applicable to fresh fish and 200 µg/kg product are applicable to fish liver used for the direct feeding of pet animals, zoo and circus animals or used as feed material for the production of pet food. The products or processed animal proteins produced from these animals (fur animals, pet animals, zoo and circus animals) cannot enter the food chain and cannot be fed to farmed animals which are kept, fattened or bred for the production of food.

[6] Fresh fish and other aquatic animals directly delivered and used without intermediate processing for the production of feed for fur animals are not subject to the maximum levels, while maximum levels of 3,5 ng WHO-PCDD/F-TEQ/kg product and 6,5 ng WHO-PCDD/F-PCB-TEQ/kg product are applicable to fresh fish and 20,0 ng WHO-PCDD/F-PCB-TEQ/kg product is applicable to fish liver used for the direct feeding of pet animals, zoo and circus animals or used as feed material for the production of pet food. The products or processed animal proteins produced from these animals (fur animals, pet animals, zoo and circus animals) cannot enter the food chain and cannot be fed to farmed animals which are kept, fattened or bred for the production of food.

[18] Table of TEF (= toxic equivalency factors) for dioxins, furans and dioxin-like PCBs: WHO-TEFs for human risk assessment based on the conclusions of the World Health Organisation (WHO) – International Programme on Chemical Safety (IPCS) expert meeting which was held in Geneva in June 2005 (Martin van den Berg et al., The 2005 World Health Organisation Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 93(2), 223–241 (2006))

Congener	TEF value	Congener	TEF value
<b>Dibenzo-p-dioxins (PCDDs)</b>		<b>Dioxin-like PCBs:</b>	
2,3,7,8-TCDD	1		
1,2,3,7,8-PeCDD	1	<b>Non-ortho-PCBs</b>	
1,2,3,4,7,8-HxCDD	0.1	PCB 77	0,0001
1,2,3,6,7,8-HxCDD	0.1	PCB 81	0,0003
1,2,3,7,8, 9-HxCDD	0.1	PCB 126	0,1
1,2,3,4,6,7,8-HpCDD	0.01	PCB 169	0,03
OCDD	0,0003		
		<b>Mono-ortho-PCBs</b>	
<b>Dibenzofuranes (PCDFs)</b>		PCB 105	0,00003

2,3,7,8-TCDF	0.1	PCB 114	0,00003	
1,2,3,7,8-PeCDF	0,03	PCB 118	0,00003	
2,3,4,7,8-PeCDF	0,3	PCB 123	0,00003	
1,2,3,4,7,8-HxCDF	0.1	PCB 156	0,00003	
1,2,3,6,7,8-HxCDF	0.1	PCB 157	0,00003	
1,2,3,7,8,9-HxCDF	0.1	PCB 167	0,00003	
2,3,4,6,7,8-HxCDF	0.1	PCB 189	0,00003	
1,2,3,4,6,7,8-HpCDF	0.01			
1,2,3,4,7,8,9-HpCDF	0.01			
OCDF	0,0003			
Abbreviations used: T= tetra; Pe= penta; Hx=hexa; Hp= hepta; O= octa; CDD= chlorodibenzodioxin; CDF= chlorodibenzofuran; CB= chlorobiphenyl				

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements	
<b>Chemical: Mycotoxin</b>							
C15	DON  (Deoxynivalenol)	Compound feed (on full ration basis) for:			GMP+	- The European Commission has published "Recommendation 2006/576/EC" regarding the guidance values for this mycotoxin. GMP+ International has established other values to comply.	
		- Pigs	0.8 mg/kg	1 mg/kg			
		- Cattle	4 mg/kg	5 mg/kg			
		- Calves up to 4 months	1.6 mg/kg	2 mg/kg			
		- Dairy cattle	2.4 mg/kg	3 mg/kg			
		- Poultry	3.2 mg/kg	4 mg/kg			
		Compound feed for lambs, kids and dogs	2 mg/kg		Commission Recommendation 2006/576/EC		
		Other compound feeds	5 mg/kg				
		Feed material (supplied to the livestock farmer for immediate feeding) for ( <sup>21</sup> )			GMP+		
		- Pigs	1 mg/kg	5 mg/kg			
		- Cattle	5 mg/kg	15 mg/kg			
		- Calves up to 4 months	2 mg/kg	6 mg/kg			
		- Dairy cattle	3 mg/kg	9 mg/kg			
		- Poultry	4 mg/kg	12 mg/kg			
		Feed materials for other purposes			Commission Recommendation 2006/576/EC	The supplier provides information to the client in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the ration	
		- Cereals and cereal products ( <sup>22</sup> ) with the exception of maize by-products	8 mg/kg				
		- Maize by-products	12 mg/kg				



[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[21] The supplier provides information to the livestock farmer in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the days ration

[22]The term 'Cereals and cereal products' includes not only the feed materials listed under heading 1 'Cereal grains and products derived thereof' of the list of feed materials referred to in part C of the European Catalogue of feed materials but also other feed materials derived from cereals in particular cereal forages and roughages.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C16	Endosulfan (sum of alfa and beta-isomers and of endosulfan sulphate, expressed as endosulfan)	Feed materials and compound feed with the exception of:  - cotton seed and products derived from the processing thereof, except crude cotton seed oil  - soybean and products derived from the processing thereof, except crude soybean oil  - crude vegetable oil,  - complete feed for fish except for <i>Salmonids</i> ,  - complete feed for <i>Salmonids</i>	-    -  -	0,1 mg/kg  0,3 mg/kg  0,5 mg/kg  1,0 mg/kg  0,005 mg/kg  0,05 mg/kg	Commission Regulation (EU) No 2015/186 amending Annex I to Directive 2002/32/EC	

[1 ] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *						
C17	Endrin (sum of endrin and deltametho-endrin, expressed as endrin)	Feed materials and compound feed with the exception of: - fats and oils	- -	0.01 mg/kg 0.05 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Salts</b>						
C19	Fluorine <sup>3</sup>	Feed materials, with the exception of:	-	150 mg/kg	Commission Regulation (EU) No <del>2015/186</del> 2019/1869 amending Annex I to Directive 2002/32/EC	
		- Feed materials of animal origin except marine crustaceans such as marine krill; calcareous marine shells;	-	500 mg/kg		
		- marine crustaceans such as marine krill	-	3 000 mg/kg		
		- phosphates	-	2 000 mg/kg		
		- calcium carbonate; calcium and magnesium carbonate <sup>11</sup>	-	350 mg/kg		
- magnesium oxide	-	600 mg/kg				
- calcareous marine algae	-	<del>1,000 mg/kg</del> 1,250 mg/kg				
		Vermiculite (E 561)	-	3 000 mg/kg		
		Complementary feed				
		- containing ≤ 4% phosphorus <sup>8</sup>	-	500 mg/kg		
		- containing > 4% phosphorus <sup>8</sup>	-	125 mg/kg per 1% phosphorus <sup>8</sup>		
		Complete feed, with the exception of:		150 mg/kg		
		- complete feed for cattle, sheep and goats				
		- in lactation	-	30 mg/kg		
		- others	-	50 mg/kg		
		- complete feed for pigs	-	100 mg/kg		
		- complete feed for poultry (except chicks) and fish	-	350 mg/kg		
		- complete feed for chicks	-	250 mg/kg		

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[3] The maximum levels refer to an analytical determination of fluorine where the extraction is done for 20 minutes at an ambient temperature with hydrochloric acid 1 N. Equivalent extraction procedures may be used where it can be demonstrated that the extraction procedure used has the same extraction efficiency

[8] The % of phosphorus is relative to a feed with a moisture content of 12 %.

[11] Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in ~~Commission Regulation (EU) No 575/2011 of 16 June 2011 on the European Catalogue of feed materials (OJ L 159, 17.6.2011, p. 25)~~

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *						
C20	Heptachlor (sum of heptachlor and heptachlor epoxyd, expressed as heptachlor)	Feed materials and compound feed, with the exception of: - fats and oils	- -	0.01 mg/kg 0.2 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *						
C21	Hexachlorobenzene (HCB)	Feed materials and compound feed, with the exception of: - fats and oils	- -	0.01 mg/kg 0.2 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *						
C22a	Hexachlorocyclohexane (HCH):  - Alfa-isomer	Feed materials and compound feed, with the exception of:  - fats and oils	-  -	0.02 mg/kg  0.2 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *						
C22b	Hexachlorocyclohexane (HCH):  - Beta-isomer		-		Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	
		Compound feeds with the exception of:	-	0.01 mg/kg		
		- compound feed for dairy cattle	-	0.005 mg/kg		
	Feed materials, with the exception of:	-	0.01 mg/kg			
	- fats and oils	-	0.1 mg/kg			

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Crop protection agents (Pesticides which are not permitted in the EU) *</b>						
C22c	Hexachlorocyclohexane (HCH):		-		Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	
	- Gamma-isomer (lindane)	Feed materials and compound feed, with the exception of:	-	0.2 mg/kg		
		- fats and oils	-	2.0 mg/kg		

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* Pesticides which are not included in Directive 2002/32 / EEC, Annex I, Section IV should comply to Regulation (EC) no. 396/2005

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Salts						
C23	Potassium	- Feed materials for delivery to cattle farms, and  - Wet mixes for delivery to cattle farmers	60 g/kg (dry matter)		GMP+	If the action limit is exceeded then a warning or processing advice must be <b><u>demonstrably communicated</u></b> to the customer.  Supply of additional water to the animals is also important to avoid health problems. More recommendations in the event of excess of the action limit can be found in GMP+ D4.13 <i>Salts in rations with wet feeds for fattening pigs and sows</i>

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Toxic substances						
C24	Hydrocarbons (C10-C40)  Mineral oil hydrocarbons (C10-C40)	Animal fat, with the exception of:	-	400 mg/kg (on product basic)	GMP+	
		- crude fish oil	-	3,000 mg/kg (on product basic)		
		Vegetable oil and fat (with the exception of sunflower oil)	-	400 mg/kg (on product basic)		
		Sunflower oil and sunflower fatty acids	-	1,000 mg/kg (on product basic)		
		Vegetable fatty acids incl. Mixes of fatty acids (with the exception of sunflower fatty acids)	-	3,000 mg/kg (on product basic)		
		Vegetable fatty acids distillates/acid oils/fatty acids from splitting/stearin fraction and olein fraction (with the exception of Sunflower fatty acid distillates/acid oils/fatty acids from splitting)	-			
	Sunflower fatty acid distillates/acid oils/fatty acids from splitting	-	1,000 mg/kg (on product basic)			
		Palm oil	-	25 mg/kg calculated as diesel oil		This norm applies if the hydrocarbons (calculated as diesel oil) are determined via the GC-MS method. If use is made of the GC-FID method, then the norm for vegetable oil applies

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Heavy metals</b>						
C26	Mercury <sup>16</sup>	<p>Feed materials, with the exception of:</p> <ul style="list-style-type: none"> <li>- fish, other aquatic animals and products derived thereof intended for the production of compound feed for food producing animals;</li> <li>- tuna (<i>Thunnus</i> spp, <i>Euthynnus</i> spp, <i>Katsuwonus pelamis</i>) and products derived thereof intended for the production of compound feed for dogs, cats, ornamental fish and fur animals;</li> <li>- fish, other aquatic animals and products derived thereof, other than tuna and derived products thereof, intended for the production of compound feed for dogs, cats, ornamental fish and fur animals;</li> <li>- fish, other aquatic animals and products derived thereof as canned wet feed material for direct feeding of dogs and cats</li> <li>- calcium carbonate; calcium and magnesium carbonate<sup>11</sup></li> </ul> <p>Compound feed, with the exception of:</p> <ul style="list-style-type: none"> <li>- mineral feed</li> <li>- compound feed for fish</li> <li>- compound feed for dogs, cats, ornamental fish and fur animals</li> </ul>	- - - - - - - - - -	<p>0.1 mg/kg</p> <p>0.5 mg/kg</p> <p>1.0 mg/kg (*)</p> <p>0.5 mg/kg (*) 1.0 mg/kg (*)</p> <p>0.3 mg/kg</p> <p>0.3 mg/kg</p> <p>0.1 mg/kg</p> <p>0.2 mg/kg</p> <p>0.2 mg/kg</p> <p>0.3 mg/kg</p>	Commission Regulation (EU) No 2017/2229 2019/1869 amending Annex I to Directive 2002/32/EC	

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[16] The maximum levels refer to the total level of mercury.

[11] Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in Commission Regulation (EU) No 575/2011 of 16 June 2011 on the European Catalogue of feed materials (OJ L 159, 17.6.2011, p. 25)

(\*): The maximum level is applicable on wet weight basis

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Heavy metals						
C27	Lead *	Feed materials, with the exception of: - forage <sup>9</sup> - phosphates; calcareous marine algae and calcareous marine shells; - calcium carbonate; calcium and magnesium carbonate <sup>11</sup> - yeast	- - - -	10 mg/kg 30 mg/kg 15 mg/kg 20 mg/kg 5 mg/kg	Commission Regulation (EU) No <del>2017/2229</del> 2019/1869 amending Annex I to Directive 2002/32/EC	
		Feed additives belonging to the functional group of compounds of trace elements, with the exception of: - zinc oxide - manganous oxide, ferrous carbonate, cupric carbonate, <del>di</del> copper (II) oxide		100 mg/kg 400 mg/kg 200 mg/kg		
		Feed additives belonging to the functional group of binders and anti-caking agents, with the exception of: - clinoptilolite of volcanic origin; natrolite-phonolite		30 mg/kg 60 mg/kg		
		Premixtures <sup>2</sup>		200 mg/kg		
		Complementary feed, with the exception of: - mineral feed - long-term supply formulations of feed for particular nutritional purposes with a concentration of trace elements higher than 100 times the established maximum content in complete feed.	- - -	10 mg/kg 15 mg/kg 60 mg/kg		
		Complete feed	-	5 mg/kg		

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[9] Green fodder includes products which are intended for feeding to animals such as hay, silage, fresh grass, etc.

[2]The maximum level established for premixtures takes into account the additives with the highest level of lead and cadmium and not the sensitivity of the different animal species to lead and cadmium. As provided in Article 16 of Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition, in order to protect animal and public health, it is the responsibility of the producer of premixtures to ensure that, in addition to compliance with the maximum levels for premixtures, the instructions for use on the premixture are in accordance with the maximum levels for complementary and complete feed.

[11] Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in ~~Commission Regulation (EU) No 575/2011 of 16 June 2011 on the European Catalogue of feed materials.~~

\* for the determination of lead in kaolinitic clay and in feed containing kaolinitic clay, the maximum level refers to an analytical determination of lead, whereby extraction is performed in nitric acid (5 % w/w) for 30 minutes at boiling temperature. Equivalent extraction procedures can be applied for which it can be demonstrated that the used extraction procedure has an equal extraction efficiency.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Mycotoxin</b>						
C28	Ergot ( <i>Claviceps purpurea</i> )	Feed materials and compound feed containing unground cereals	-	1,000 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Salts						
C29	Sodium	<ul style="list-style-type: none"> <li>- Feed materials for delivery to cattle farms, and</li> <li>- Wet mixes for delivery to cattle farmers</li> </ul>	8 g/kg (dry matter)		GMP+	<p>If the action limit is exceeded then a warning or processing advice must be <b><u>demonstrably communicated</u></b> to the customer.</p> <p>Supply of additional water to the animals is also important to avoid health problems. More recommendations in the event of excess of the action limit can be found in GMP+ D4.13 <i>Salts in rations with wet feeds for fattening pigs and sows</i></p>

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Heavy metals						
C30	Nickel	Feed fats Oils and fats from vegetable or animal origin	20 mg / kg (on a fat basis)	50 mg / kg (on a fat basis)	GMP+	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Other undesirable substances and products</b>						
C31	Nitrites	Feed materials, with the exception of:	-	15 mg/kg (expressed in sodium nitrite)	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	
		- Fish meal	-	30 mg/kg (expressed in sodium nitrite)		
- silage	-	-				
- Products and by-products from sugar beet and sugarcane and from starch production and alcoholic drink production.	-	-				
		Complete feed, with the exception of:	-	15 mg/kg (expressed in sodium nitrite)		
		- complete feed for dogs and cats with a moisture content exceeding 20 %.	-	-		

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Harmful Botanical impurities</b>						
C32	Weed seeds and unground and uncrushed fruits containing alkaloids, glucosides or other toxic substances separately or in combination including	Feed material and compound feed	-	3,000 mg/kg	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Other undesirable substances and products</b>						
C33	Insoluble impurities	Rendered fats from ruminants	-	0,15%	Commission Regulation (EU) 142/2011, Annex X, Chapter II, Section 3	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Mycotoxin</b>						
C34	Ochratoxin A	Compound feed on full ration basis for:			GMP+	- The European Commission has published recommendation 2006/576/EC regarding the guidance values for this mycotoxin. GMP+ International has established other values to comply.
		- sows and consumption pigs and piglets	0.04 mg/kg	0.05 mg/kg		
		- poultry	0.16 mg/kg	0.2 mg/kg		
		Compound feed for cats and dogs	0,01 mg/kg		Commission Recommendation 2006/576/EC	
		Feed material (supplied to the livestock farmer for immediate feeding) for <sup>(21)</sup>			GMP+	
- Sows and pigs and piglets	0.05 mg/kg	0.15 mg/kg				
- Poultry	0.2 mg/kg	0.6 mg/kg				
Feed materials for other purposes				Commission Recommendation 2006/576/EC	The supplier provides information to the client in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the ration	
		- Cereals and cereal products <sup>(22)</sup>	0,25 mg/kg			

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

(21) The supplier provides information to the livestock farmer in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the days ration

(22) The term 'Cereals and cereal products' includes not only the feed materials listed under heading 1 'Cereal grains and products derived thereof' of the list of feed materials referred to in part C of the European Catalogue of feed materials but also other feed materials derived from cereals in particular cereal forages and roughages.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Toxic substances						
C35a	Polycyclic Aromatic Hydrocarbons (PAH4)	Oils and fats (excluding palm(kernel)-, coconutoil and products derived thereof)  Palm(kernel)-, coconutoil and and products derived thereof)	160 µg/kg (on fat basis)  320 µg/kg (on fat basis)	200 µg/kg (on fat basis)  400 µg/kg (on fat basis)	GMP+	- (PAH4=sum of benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene See the GMP+ D documents: - GMP+ D4.14 - GMP+ D415  <a href="#">Reports - D Documents - GMP+ International Portal</a>

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Antinutritional factors: Glucosides</b>						
C38	Seeds and husks from <i>Ricinus communis</i> L., <i>Croton tiglium</i> L. and <i>Abrus precatorius</i> L. as well as their processed derivatives (in so far determinable by analytical microscopy), separately or in combination	Feed materials and compound feed.	-	10 mg/kg <sup>23</sup>	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[23] Includes also seed husk fragments.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Salts						
C39	Sulphate	<ul style="list-style-type: none"> <li>- Feed materials for delivery to cattle farms, and</li> <li>- Wet mixes for delivery to cattle farmers which are preserved with sulphuric acid and not for products which by nature are rich in sulphur</li> </ul>	8 g/kg (dry matter)		GMP+	<p>If the action limit is exceeded then a warning or processing advice must be <b><u>demonstrably communicated</u></b> to the customer.</p> <p>Supply of additional water to the animals is also important to avoid health problems. More recommendations in the event of excess of the action limit can be found in GMP+ D4.13 <i>Salts in rations with wet feeds for fattening pigs and sows</i></p>

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Antinutritional factors: Alkaloids</b>						
C40	Theobromine	Complete feed, with the exception of: - complete feed for pigs - complete feed for dogs, rabbits, horses and fur animals	- - -	300 mg/kg 200 mg/kg 50 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Antinutritional factors: Glucosides</b>						
C41	Vinyl thioxazolidone (5-vinyloxazolidine-2-thione)	Complete feed for poultry with the exception of:  - complete feed for laying hens	-  -	1,000 mg/kg  500 mg/kg	Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Antinutritional factors: Glucosides</b>						
C42	Volatile mustard oil	Feed materials, with the exception of:  - Camelina seed and products derived thereof (*), products derived from mustard seed (*), rape seed and products derived thereof.	-  -	100 mg/kg (calculated as allylisothiocyanate)  4,000 mg/kg (calculated as allylisothiocyanate)	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	
		Complete feed, with the exception of:  - Complete feeds for cattle (except calves), sheep (except lambs) and goats (except kids)  - Complete feeds for pigs (except of piglets) and poultry	-  -  -	150 mg/kg (calculated as allylisothiocyanate)  1,000 mg/kg (calculated as allylisothiocyanate)  500 mg/kg (calculated as allylisothiocyanate)		

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* : Upon request of the competent authorities, the responsible operator must perform an analysis to demonstrate that the content of total glucosinolates is lower than 30 mmol/kg. The method of analysis of reference is EN-ISO 9167-1:1995

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Antinutritional factors: Other</b>						
C43	Free gossypol	Feed materials, with the exception of:	-	20 mg/kg	Commission Regulation (EU) No <del>574/2011</del> 2019/1869 amending Annex I to Directive 2002/32/EC	
		- cotton seed	-	5,000 mg/kg 6 000 mg/kg		
		- cotton seed cake and cotton seed meal	-	1,200 mg/kg		
		Complete feed, with the exception of:	-	20 mg/kg		
		- complete feed for cattle (except calves)	-	500 mg/kg		
		- complete feed for sheep (except lambs) and goats (except kids),	-	300 mg/kg		
		- complete feed for poultry (except laying hens) and calves	-	100 mg/kg		
		- complete feed for rabbits, lambs, kids and pigs (except piglets)	-	60 mg/kg		

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Mycotoxin</b>						
C44	Zearalenon	Compound feed on full ration basis for:			GMP+	- The European Commission has published "Recommendation 2006/576/EC" regarding the guidance values for this mycotoxin. GMP+ International has established other values to comply.
		- sows and consumption pigs	0.2 mg/kg	0.25 mg/kg		
		- young pigs	0.08 mg/kg	0.1 mg/kg		
		- young cattle and dairy cattle	0.4 mg/kg	0.5 mg/kg		
		Compound feed for:			Commission Recommendation 2006/576/EC	
- puppies, kittens, dogs and cats for reproduction	0,1 mg/kg					
- adult dogs and cats other than for reproduction	0,2 mg/kg					
- sheep (including lamb) and goats (including kids)	0,5 mg/kg					
Feed material (supplied to the livestock farmer for immediate feeding) for <sup>(21)</sup>				GMP+		
- sows and pigs	0.25 mg/kg	0.75mg/kg				
- young pigs	0.1 mg/kg	0.3 mg/kg				
- young cattle and dairy cattle	0,5 mg/kg	1.5 mg/kg				
Feed materials for other purposes				Commission Recommendation 2006/576/EC	The supplier provides information to the client in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the ration	
- Cereals and cereal products <sup>(22)</sup> with the exception of maize by-products	2 mg/kg					
- Maize by-products	3 mg/kg					

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[21] The supplier provides information to the livestock farmer in the event of infringement of the action limit for the level of the undesirable substance and provides advice on processing the product in the days ration

[22] The term 'Cereals and cereal products' includes not only the feed materials listed under heading 1 'Cereal grains and products derived thereof' of the list of feed materials referred to in part C of the European Catalogue of feed materials but also other feed materials derived from cereals in particular cereal forages and roughages.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Chemical: Other undesirable substances and products</b>						
C46	Melamine <sup>24</sup>	Feed, with the exception of - canned pet food  - the following feed additives:  - guanidino acetic acid (GAA),  - urea  - biuret		2,5 mg/kg  2,5 mg/kg *    20 mg/kg  -  -	Regulation (EU) No 2017/2229 amending Annex I to Directive 2002/32/EC	<i>EFSA recommendation: LC-MS/MS (liquid chromatography coupled to mass spectrometry)</i>

[1] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[24] The maximum level refers to melamine only. The inclusion of the structurally related compounds cyanuric acid, ammeline and ammelide in the maximum level will be considered at a later stage.

\*: The maximum level is applicable to canned pet food as sold.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Pesticides (Crop protection agents)						
C62	Pesticides	Animal feed		The statutory limits of EU Regulation 396/2005 are valid.  See part 4 of this document	Regulation (EC) No 396/2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin.	

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Mycotoxin						
C109	Fumonisin B1 + B2	Feed materials			GMP+ (Commission Recommendation No 2006/576/EC)	Particular attention has to be paid to cereals and cereals products fed directly to the animals that their use in a daily ration should not lead to the animal being exposed to a higher level of these mycotoxins than the corresponding levels of exposure where only the complete feedingstuffs are used in a daily ration.
		- maize and maize products *	60 mg/kg			
		Complementary and complete feedingstuffs for:				
		- pigs, horses (Equidae), rabbits and pet animals	5 mg/kg			
		- fish	10 mg/kg			
- poultry, calves (< 4 months), lambs and kids	20 mg/kg					
- adult ruminants (> 4 months) and mink	50 mg/kg					

[1 ] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[\*]The term 'Maize and maize products' includes not only the feed materials derived from maize listed under heading 1 'Cereal grains, their products and by-products' of the non-exclusive list of main feed materials referred to in the Annex, part B of Directive 96/25/EC but also other feed materials derived from maize in particular maize forages and roughages. (note: Directive 96/25/EC is replaced by the Catalogue of feed materials)

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit	Rejection limit	Source	Supplementary requirements
<b>Chemical: Mycotoxin</b>						
C113	T-2 and HT-2 toxin, Sum of	Unprocessed cereals:			GMP+ (Commission Recommendation No 2013/165/EC)	Unprocessed cereals are cereals which have not undergone any physical or thermal treatment other than drying, cleaning and sorting.
		- barley (including malting barley) and maize	200 µg/kg (on product basis) *			
		- oats (with husk)	1000 µg/kg (on product basis) *			
		- wheat, rye and other cereals	100 µg/kg (on product basis) *			
		Cereal products for feed and compound feed				
		- oat milling products (husks)	2000 µg/kg *1			
		- other cereal products	500 µg/kg *1			
		- compound feed, with the exception of feed for cats	250 µg/kg *1			
		Compound feed for cats	0,05 mg/kg *1		GMP+ (Commission Recommendation No 2013/637/EC)	

[1 ] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

[\*]The levels referred to in this Annex are indicative levels above which, certainly in the case of repetitive findings, investigations should be performed on the factors leading to the presence of T-2 and HT-2 toxin or on the effects of feed and food processing. The indicative levels are based on the occurrence data available in the EFSA database as presented in the EFSA opinion. The indicative levels are not feed and food safety levels.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
Chemical: Other undesirable substances and products						
C134	Polyethylene	- Fat and oil products (feed materials)	0.25 g/kg (on fat basis)	0.5 g/kg (on fat basis)	GMP+	See GMP+ BA 3: Negative list.

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F5	Unhusked beech mast - <i>Fagus sylvatica</i> L.	Feed materials and compound feed	-	Seeds and fruits of the plant species listed opposite as well as their processed derivatives may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F6	Chinese mustard – Brassica juncea (L.) Czern. and Coss. ssp. juncea var. lutea Batalin	Feed materials and compound feed	-	Seeds may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F7	Ethiopian mustard – Brassica carinata A. Braun	Feed materials and compound feed	-	Seeds may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F8	Indian mustard - Brassica juncea (L.) Czern. and Coss. ssp. integrifolia (West.) Thell.	Feed materials and compound feed	-	Seeds may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
C10	Crotalaria spp.	Feed materials and compound feed	-	100 mg/kg	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.



## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F10	Purghera - <i>Jatropha curcas</i> L.	Feed materials and compound feed	-	Seeds and fruits of the plant species listed opposite as well as their processed derivatives may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Fysical: Harmful Botanical impurities</b>						
F12	Sareptian mustard - Brassica juncea (L.) Czern. and Coss. ssp. juncea	Feed materials and compound feed	-	Seeds may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F13	Seeds from Ambrosia spp.	Feed materials (*), with the exception of:	-	50 mg/kg	Commission Regulation (EU) No 2015/186amending Annex I to Directive 2002/32/EC	
		- Millet (grains of <i>Panicum miliaceum</i> L.) and sorghum (grains of <i>Sorghum bicolor</i> (L) Moench s.l.) not directly fed to animals (*)		200 mg/kg		
		Compound feed containing unground grains and seeds	-	50 mg/kg		

[1 ] **Action limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

**Rejection limit:** A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

(\*): In case unequivocal evidence is provided that the grains and seeds are intended for milling or crushing, there is no need to perform a cleaning of the grains and seeds containing con-compliant levels of seeds of *Ambrosia* spp. before milling or crushing on the condition that: —the consignment is transported as a whole to the milling or crushing plant, and — the milling or crushing plant is informed in advance of the presence of high level of *Ambrosia* spp. seeds in order take additional prevention measures to avoid dissemination into the environment, and —solid evidence is provided that prevention measures are taken to avoid dissemination of *Ambrosia* spp. seeds into the environment during transport to the crushing or milling plant, and — the competent authority agrees to the transport, after having ensured that the abovementioned conditions are fulfilled. In case these conditions are not fulfilled, the consignment must be cleaned before any transport into the EU and the screenings must be appropriately destroyed.'

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
F14	Black mustard – Brassica nigra (L.) Koch	Feed materials and compound feed	-	Seeds may only be present in feed in trace amounts not quantitatively determinable	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Other undesirable substances and products</b>						
F26	Radioactivity  Sum of Cs-134 and Cs-137	Feed intended for:  - cattle and horses  - pig  - poultry  - fish (*)		100 (Bq/kg)  80 (Bq/kg)  160 (Bq/kg)  40 (Bq/kg)	Commission Implementing Regulation (EU) No 2016/6 is amended by Commission Implementing Regulation (EU) No . 2017/2058 . (note: The new regulation does not concern adoption of new standards)	- Special conditions governing the import of feed originating in or consigned from Japan following the accident at the Fukushima nuclear power station.  - In order to ensure consistency with maximum levels currently applied in Japan, these values replace on a provisional basis the values laid down in Regulation (Euratom) 2016/52.

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

\* With the exemption of feed for ornamental fish.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit	Rejection limit	Source	Supplementary requirements
<b>Physical: Bodies foreign to the product</b>						
F30	Packaging material	<ul style="list-style-type: none"> <li>- Feed materials for delivery to livestock farms, and</li> <li>- Wet mixes for delivery to livestock farmers</li> </ul>	-	1.5 g/kg (dry matter basis)	GMP+	<p>Packaging materials are fibres of paper and board, fragments of plastic, aluminium foil and metal, plastic clips, metal wires, etc.</p> <p>Via manual separation and weighing</p> <p>See GMP+ BA 3: Negative list</p> <p>This norm was included subject to the outcome of the discussion taking place in the European Commission.</p>

[1] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## SUMMARY OF GMP+ SPECIFIC FEED SAFETY LIMITS FOR THE ANIMAL FEED SECTOR

	Contaminant	Product	Action limit <sup>(1)</sup>	Rejection limit <sup>(1)</sup>	Source	Supplementary requirements
<b>Physical: Harmful Botanical impurities</b>						
C32a	- Datura sp.	Feed material and compound feed	-	1,000 mg/kg	Commission Regulation (EU) No 1275/2013 amending Annex I to Directive 2002/32/EC	

[1 ] Action limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then an investigation into the cause should be undertaken and corrective measures should be taken to remove or control that cause. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

Rejection limit: A feasible limit agreed in consultation with the sector, supplier or customer. If this limit is exceeded then the product is not suitable for use as feed material or animal feed. Maximum levels in mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.

## 4. Residue levels of pesticides in feeds

### 4.1. Introduction

The maximum residue levels of pesticides (MRL) of GMP+ FC scheme are based on EU Regulations. These are:

- Regulation (EC) No. 396/2005. This regulation includes the MRLs for unprocessed products of vegetable and animal origin intended for human consumption and for feed. As much as the MRLs apply to feed they are applicable to both feed for food-producing animals and for non-food-producing animals.

The structure/design of the Regulation is as such, that in many cases it is not immediately possible to indicate a MRL for a certain combination of feed / pesticide. Therefore this chapter provides guidance in finding the applicable MRL.

- Directive 2002/32/EG, Annex I, part IV regarding undesirable substances in feed. This Directive contains MRLs for certain specific ~~Organochlorides~~ Organochlorine compounds. Those MRL's are included in part 3 of this document (GMP+ BA1).

#### 4.1.1 List of terms

Below you'll find a list of the most common (used) terms with a brief explanation.

**MRL:** A maximum residue level (MRL) is the highest level of a pesticide residue that is legally tolerated in or on food or feed when pesticides are applied correctly (Good Agricultural Practice).

**EU Pesticides database:** This database is created by the European Commission. The [EU Pesticides database](#) can be consulted on Commissions website to search for the MRLs applicable to each pesticide and to each crop/product of animal origin.

**Log Pow:** The octanol-water partition coefficient ( $\log Pow$ ) of a pesticide indicates whether a pesticide is water or fat-soluble. When a  $\log Pow$  of a pesticide exceeds 3, the pesticide is considered **totally** fat-soluble.

*Note: Another factor to be taken into account is the affinity of the substance for the extraction solvent. In fact, some pesticides with a  $\log Pow$  below 3, which are not expected to concentrate in the oil, can show the tendency to concentrate in the oil due to their solubility in solvents like e.g. hexane in absence of information regarding the fat solubility of a particular pesticide, the affinity of the pesticide for the extraction solvent may also be considered. Some pesticides can show the tendency to concentrate in the oil phase due to their solubility in the extraction solvent. The behavior of such pesticides will however have to be analyzed on a case-by-case basis. This is the responsibility of the food or feed business operator. Read [GMP+ D3.19 FAQ Pesticides residues](#) for more information about the application of processing factors.*

**Suffix (F):** The EU Pesticides database indicates, by putting (F) behind the particular pesticide, which pesticides are **totally** fat soluble.

**Processing factor** [synonym: Transfer factor; concentration factor]: Regulation No. 396/2005 sets MRLs for unprocessed/primary products, like oilseeds. MRLs for pesticides in processed products, like



crude oils, are not specifically set in EU legislation. According to Article 20 of Regulation (EC) No. 396/2005, MRLs for pesticides in processed products have to be derived from the MRLs for unprocessed products, taking into account the concentration or dilution caused by the processing (E.g. concentration caused by drying- and extraction processes).

Annex VI of Regulation (EC) No. 396/2005 should contain a list of specific concentration or dilution factors for certain processing and/or mixing steps or for certain processed and/or composite products.

**NOTE:** *At this time Annex VI was not yet completed.*

Read [GMP+ D3.19 FAQ Pesticides residues](#) for more information about the application of processing factors.

**Footnote 1:** For a limited number of products the MRL in Regulation (EC) No. 396/2005 may not apply. This is according to the so-called "footnote 1" of Annex 1 of Regulation (EC) No. 396/2005. Currently there are a lot of uncertainties about the implementation of this footnote. Read [GMP+ D3.19 FAQ Pesticides residues](#) for more information.

## 4.2. The establishment of an MRL conform Regulation (EC) No. 396/2005

### 4.2.1. General

The MRLs are to be found in "[EU Pesticides database](#)" a database which was created by the European Commission. In this database you will, almost always, find MRLs for unprocessed products. This means that a number of calculations must be carried out both for the determination of the MRL in a processed/derived product (for example, sunflower oil, maize gluten meal) and for the determination in composite products (for example complete feed for young chickens, complementary feed for cattle).

The correct MRL can be determined using the questionnaires as mentioned in table 1. Per product group defined, there is a specific questionnaire. In total, there are 3 questionnaires. The basic principle of these questionnaires is that there is a known pesticide and that the associated MRL must be found for a particular feed.

Table 1: Definitions and questionnaires

Product group	Definition
Unprocessed product	Single unprocessed/basic/primary/ product of vegetable or animal origin (wheat, barley, linseed, sunflower seeds, soya bean, peas, shrimps)
Processed products	Single, treated/processed or derived product, originating from an unprocessed product (wheat flour, semolina pellets, potato press fibres, soya flakes, Soya (bean) expeller, linseed oil, peapod meal, fish meal)
Composite product	Composite product consisting of at least two components being unprocessed products, processed products and/or feed additives. (complete feed, supplementary feed, petfood, grain mixes, premixtures)

\* **NOTE:** These definitions have only been drawn up to improve the readability of Chapter 4 and have no value or legitimacy outside this chapter.

#### 4.2.2. Questionnaire for unprocessed products

1. Check if Directive 2002/32/EG contains an MRL for your unprocessed product / pesticide combination. Have you found a match?
  - Yes** You have found the MRL for the pesticide **(end)**.
  - No** Go to question 2
  
2. Is your product a unprocessed product or product group for which "footnote 1" from Annex 1 of Regulation (EC) No. 396/2005 applies? See par. 4.1.1 for more information about footnote 1.
  - Yes** There is no MRL in accordance with Regulation (EC) No. 396/2005 for your unprocessed product yet.  
*Note: Companies must, at all times, make a risk assessment of the detected pesticide content in order to ensure the feed safety:*
    - *It is possible that the country of origin does have a MRL.*
    - *Also in the [Codex Alimentarius](#) MRL's are available of pesticide-commodity combination.*
  - No** Go to question 3.

From now on, you can use the [EU Pesticides database](#).

3. Is your unprocessed product included in Annex I of Reg. (EC) No. 396/2005, either as an individual product (column 3, 4 and 5) or as a group of products (column 2) or in the EU Pesticides database?
  - Yes** Go to question 4.
  - No** Option 1: Your unprocessed product is probably not a single untreated/unprocessed product of vegetable or animal origin. Check your product using the definitions in Table 1. Consult your supplier if needed.  
Option 2: If your unprocessed product still is a single unprocessed product of animal or vegetable origin, there is no MRL in accordance with Regulation (EC) No. 396/2005 for your unprocessed product **(end)**
  
4. Is the pesticide for which you are searching an MRL included in the [EU pesticides database](#)?
  - Yes** Go to question 5.
  - No** The pesticide has not yet been specified. The applicable MRL is 0.01 mg/kg for unprocessed products. **(end)**
  
5. In the [EU Pesticides database](#) select, your unprocessed product and the pesticide for which you want the MRL. Click the button "Search current MRL". You have found the MRL. Place the mouse cursor on the MRL or click on the pesticide for additional information. Carefully read any footnotes applicable to the MRL **(end)**.

4.2.3. [Questionnaire for processed products](#)

1. Check if Directive 2002/32/EG contains an MRL for your processed product / pesticide combination. Have you found a match?
  - Yes** You have found the MRL for the pesticide **(end)**.
  - No** Go to question 2
  
2. Is "footnote 1" applicable for your processed product? See par. 4.1.1 for more information about "footnote 1".
  - Yes** There is not yet an MRL in accordance with Regulation (EC) No. 396/2005 for your processed product.  
*Note: Companies must, at all times, make a risk assessment of the detected pesticide content or verify if the MRL is not exceeded (where applicable taking the relevant processing factor into account), in order to ensure the feed safety:*
    - *It is possible that the country of origin does have a MRL.*
    - *Also in the [Codex Alimentarius](#) MRL's are available of pesticide-commodity combination.*
  - No** Go to question 3.
  
3. Is your processed product included in Annex I of Reg. (EC) No. 396/2005, either as a by-product (column 2 in combination with 3, 4, 5 or 6) or as a group of products (column 2) or in the form of the unprocessed product?
  - Yes** Go to question 4.
  - No** Option 1: Your processed product is probably not a product of vegetable or animal origin. Check your product using the definitions in Table 1. Consult your supplier if needed.  
Option 2: If your processed product still is a product of vegetable or animal origin, there is no MRL in accordance with Regulation (EC) No. 396/2005 for your processed product.

You have established that the MRL from this regulation apply to your processed product. Use the questionnaire for unprocessed products (4.2.2.) question 4 and further, to determine the MRL for the unprocessed product (the original product or the relevant product group). Proceed with question 4.

4. Is the processed product for which the MRL is established equal to the processed product for which you are looking for an MRL?
  - Yes** The MRL you have found is the MRL for this processed product / pesticide combination. **(end)**
  - No** Go to question 5.
  
5. In Reg. (EC) No. 396/2005, Annex VI, is there a processing (concentration- or dilution factor) factor established for your processed product or for the treatment / processing which is the basis for your processed product?  
 See par. 4.1.1 for more information about processing factors.
  - Yes** Use this factor to determine the final MRL for this processed product / pesticide combination. **(end)**
  - No** Go to question 6.

6. Is the treatment / processing for this processed product based on the separation of a fat and water fraction?

**Note:** "processing" also covers other processes than those based on separating fat and water fraction (such as grinding rice kernels). For such processes, you can also apply processing factors, if well-founded.

**Yes** Go to question 7.

**No** The processing / treatment has no effect on the residue level, the MRL which you have found is the final MRL for this processed product/pesticide combination. **(end)**

In the rest of this questionnaire you determine whether there is an accumulation of residues in the fat fraction or in the fat-free fraction.

7. Does the name of the pesticide in the [EU Pesticides database](#) have the suffix (F)?

**Yes** The pesticide is soluble in fat. Determine, using the fat percentage in the original product and in your processed product, the dilution or concentration factor and divide or multiply this by the MRL found for the original product(group) in order to determine the final MRL. **(end)**

**Note:** FEDIOL has issued a [paper](#) on this subject, in which some processing factors (for oil and fat products) are laid down. You can use these processing factor in your calculation.

**No** Go to question 8.

8. Search in the [Pesticide Properties DataBase](#) for the pesticide in question and note the "Octanol/water partition coefficient" (log Pow). The log Pow is a **measure indicator** of the solubility in water or fat of the pesticide. Is the log Pow greater or equal to 3<sup>1</sup>?

**Yes** The pesticide is soluble in fat. Determine, using the fat percentage in the original product and in your processed product, the dilution or concentration factor and divide or multiply this by the MRL found for the original product(group) in order to determine the final MRL. **(end)**

**No** Go to question 9.

9. The log Pow is less than 3. The pesticide is soluble in water. Use the fat percentage in the original product and your processed product to determine the dilution or concentration factor and divide or multiply this by the MRL you found for the original product or product group in order to determine the final MRL. **(end)**.

**Note:** *In this case, where there is a pesticide which is soluble in water, there is dilution in the fat fraction and concentration in the fat-free fraction!*

Is the log Pow is  $\geq 1$  and  $< 3$ ?

**Yes** It can be assumed that most of the pesticide will concentrate in the oil, even though not totally. In this case, to be on the safe side, the MRL for crude oil corresponds to the seed MRL multiplied by 0,909 x the theoretical processing factor of the specific primary product.

**No** Go to question 10.

<sup>1</sup> Source:

- Regulation (EC) No. 396/2005, Annex II, footnote nr. 6

- Fediol document "Establishing processing factors for vegetable oils and fats"

10. Is the log Pow between 0 and <1,  
**Yes** It can be assumed that the pesticide will be present in both the oil and water phase. The MRL from the EU pesticide database is applicable.  
**No** Go to question 11.
11. Is the log Pow < 0?  
**Yes** It can be assumed that the pesticide will concentrate in the water phase. The MRL from the EU pesticide database is applicable.

*NOTE: In this case, where there is a pesticide which is soluble in water, there is dilution in the fat fraction and concentration in the fat-free fraction! In case, a log Pow is not available in the PPDB, other reliable sources may be consulted. The method described in this section for the determination of maximum residue limits (MRL) in fats and oils also applies to fatty acids.*

*For more information about the application and calculation of processing factors for fat and oil products see the [MVO website](#) and the [FEDIOL paper](#).*

#### 4.2.4. Questionnaire for composite products

1. Check if Directive 2002/32/EG contains an MRL for your product / pesticide combination. Have you found a match?
  - Yes** You have found the MRL for the pesticide (**end**).
  - No** Go to question 2
  
2. Specify the individual components of your composite products. In Reg. (EC) No. 396/2005, Annex VI, has a processing (concentration or dilution) factor has been established for :
  - your composite product,
  - a certain fraction of your composite product,
  - a processed product that is part of your composite product?

See par. 4.1.1 for more information about processing factors.

  - Yes** Use this factor or factors to determine the final MRL for this specific part of your composite product and to determine the pesticide in question. Go to question 3.
  - No** Go to question 3.
  
3. Does your composite products contain basic products among other things?
  - Yes** For each of these components go through the questionnaire in par. 4.2.2. In order to determine the MRLs for these components. Go to question 4
  - No** Go to question 4.
  
4. Your composite products contains (among other things) processed products. For each of these components go through the questionnaire in par. 4.2.3. In order to determine the MRLs for these components. Go to question 4 5.
  
5. Have you determined an MRL for all the components for which an MRL has been set and have you taken account of the processing (concentration or dilution) factors laid down in question 2?
  - Yes** Go to question 6.
  - No** Go through this questionnaire again starting at question 2

6. Now determine the MRL for the specific pesticide in the composite product in the following way

$$\text{MRL}_x = \{(N_x C_1 * C_1) + (N_x C_2 * C_2) \dots + (N_x C_n * C_n)\} / \Sigma C_1:C_n$$

- Where:  $\text{MRL}_x$  : Is the maximum residue for pesticide X in the composite products  
 $N_x C_n$  : The MRL found for the component / group of components C (1 to n)  
 $C_n$  : The percentage in the composite products for component / group of components C (1 to n)  
 $\Sigma C_1:C_n$  : The sum of the percentages of components for which an MRL for pesticide X actually applies

#### 4.2.5. [Exceptions \(under conditions\) in Regulation \(EC\) No. 396/2005](#)

##### **Fumigants**

Member States may authorize, further to a post-harvest treatment with a fumigant on their own territory, residue levels for an active substance which exceed the limits specified in Annexes II of and III Regulation (EC) No. 396/2005 for a product covered by Annex I of Regulation (EC) No. 396/2005 where the active substance/product combinations are listed in Annex VII provided that:

- a) such products are not intended for immediate consumption;
- b) appropriate controls are in place to ensure that such products cannot be made available to the end user or consumer, if they are supplied directly to the latter, until the residues no longer exceed the maximum levels specified in Annexes II or III;
- c) the other Member States and the Commission have been informed of the measures taken.

The pesticides for which this permission applies and also the products involved are specified in Annex VII of Reg. (EC) No. 396/2005.

**GMP+ International**

Braillelaan 9  
2289 CL Rijswijk  
The Netherlands

t. +31 (0)70 – 307 41 20 (Office)  
+31 (0)70 – 307 41 44 (Help Desk)  
e. [info@gmpplus.org](mailto:info@gmpplus.org)

Disclaimer:

*Deze publicatie is vastgesteld om belangstellenden te informeren over GMP+ normen. De publicatie wordt regelmatig geactualiseerd. GMP+ International B.V. is niet aansprakelijk voor eventuele onvolkomenheden in deze publicatie.*

© GMP+ International B.V.

*Alle rechten voorbehouden. De informatie uit deze publicatie mag worden geraadpleegd op het scherm, gedownload en geprint, mits dit gebeurt voor eigen, niet-commercieel gebruik. Voor ieder ander gewenst gebruik dient vooraf schriftelijke toestemming van GMP+ International B.V. te worden verkregen.*

