

Technical Specifications

TS1.5 - Specific feed safety limits

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1. Introduction / Scope of this document

In the different GMP+ documents there are many references made to specific feed safety limits. In this document you will find an overview. These standards were created in consultation with the relevant parties in the animal production chain.

DISCLAIMER: GMP+ International has compiled this list in order to inform interested parties with respect to the standards. The list will be regularly updated. GMP+ International is not liable for any errors in this list.



2. Specific feed safety limits

There are two clear limits in GMP+ product standards if undesirable substances are found in any type of feed: the **action limit**, and the **rejection limit**. These limits refer to what it means for the GMP+ certified company if specified levels of undesirable substances are found in feed. The action limit for undesirable substances is lower than the rejection limit.

As is stated in the various GMP+ documents, the certified company must ensure that deviations (in the product or process) from the requirements in this document are recorded and controlled in order to prevent unintentional use or delivery of the product

The product standards for the maximum level of undesirable substances is calculated proportionately from the product standard for the individual component for mixes of feed materials (semi-manufactured product) which are marketed as such.

Action limit

If undesirable substances are found in any type of feed at levels above the **action limit** — and below the **rejection limit** — this means you must take action.

If the **action limit** is exceeded — then the GMP+ certified company must investigate the source of the contamination, and take measures to remove or limit the source of the contamination (see R1.0 *Feed Safety Management Systems Requirements*, § 8.7).

This limit has been agreed upon in consultation with the sector, the supplier, or the customer.

Rejection limit

If undesirable substances are found in feed at levels above the **rejection limit** then the product is <u>not suitable for use</u> as a feed material or feed (see R1.0 *Feed Safety Management Systems Requirements*, § 8.7).

This limit has been agreed upon in consultation with the sector, the supplier, or the customer.



Microbiological hazards

Code	Contaminant	Product	Action limit	Rejection limit	Supplementary requirements		
Micro	Microbiological: Other undesirable substances and products						
M1	Antibacterial inhibition	Feed materials	-	< 15 mm	According to the 5-plate test MB003, derived from EG-4-plate test,		
		Wet mixes			product basis (RIVM report no. 206; Archiv fur Lebensmittel-hygiene 31 (1981) page 97-140.		

1. <u>Action limit</u>: 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.



Code	Contaminant	Product	Action limit ¹	Rejection limit ¹	Supplementary requirements
/licro	biological		1		
M3	Enterobacteriaceae	Animal by-products that are placed on the market as feed materials.		300 CFU/g	n = 5, c = 2, m = 10, M = 300 in 1 g ⁻² 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 Dogchews and processed petfood, with the exception of canned petfood Canned petfood ³ 		300 CFU/g	 n = 5, c = 2, m = 10, M = 300 in 1 g² 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.
		Raw petfood	5.000 CFU/g		The process of production of raw petfood shall meet the following 'process hygiene criterion' **: $n = 5, c = 2, m = 500 in 1 g, M = 5.000 in 1 g^{2}$

	Samples are taken during production and/or during storage (before dispatch). Process hygiene criterion' means a criterion indicating the acceptable functioning of the production process. Such a criterion is not applicable to products placed of the market. It sets an indicative contamination value above which corrective actions are required in order to maintain the hygiene of the process in compliance wit general requirements for the safety of feed. See Regulation 142/2011, annex XIII, chapter 2, point for more details (e.g. control measures, notification to the competent authority, etc.) on this "process hygien
	criterion".
	Further, for imports from outside the European Union
	(EU) specific requirements may apply. See Regulation (EU) 142/2011 for more information.

<u>Rejection limit</u>: 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. 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.

3. Canned petfood which has been subjected to heat treatment with a Fc value of at least 3



Code	Contaminant	Product	Action limit	Rejection limit	Supplementary requirements				
Micro	licrobiological: Microbiological contamination								
M4a	Salmonella	 Consumption chick feed: end products and feed materials for: Top breeding consumption chicks Breeding increase consumption chicks Increase consumption chicks Consumption chicks 	-	0 ⁺ % ⁴ (approaching 0%)					
		 Laying poultry feed: end products and feed materials for: Top breeding laying poultry Raising increase laying poultry Increase laying poultry 	-	0 ⁺ % ⁴ (approaching 0%)					
		Laying-hens and breeding hens	1%	0 ⁺ % ⁴ (approaching 0%) for S. enteritidis and S. typhimurium					
		 Turkey feed: end products and feed materials for: Raising increase turkeys Increase turkeys Consumption turkeys 	-	0 ⁺ % ⁴ (approaching 0%)					

		Other animal feeds, feed materials and wet mixes intended for livestock farms (except for poultry	-	Absent in 25 gr	
		feeds). From animal by-products derived products with the exception of canned petfood	-	Absent in 25 gr	n = 5, c = 0, m = 0, M = 0 ²
		From animal by-products derived canned petfood		-	Canned petfood which has been subjected to heat treatment with a Fc value of at least 3
M4b	M4b Salmonella preservation determined through pH	Feed materials for delivery to livestock farms;		Maximum pH	If preservation can be achieved at a higher pH then this should be
		Wet mixes for delivery to livestock farmers on the basis of:		for guarantee:	supported with data. These norms do not apply if the products are supplied at a
		Spontaneous lactic acid fermentation	-	4.5	temperature of at least 60°C and the supplier is demonstrably
		Add organic acids	-	4	informed of the storage conditions.
		Add inorganic acids	-	3,5	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.

<u>Rejection limit</u>: 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. 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.

4. Explanation of 0^+ : 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^+).



Code	Contaminant	Product	Action limit	Rejection limit	Supplementary requirements			
Micro	Microbiological: Microbiological contamination							
M5a	Moulds	Feed materials	10 ⁶ CFU/g		In the TNO report "Norm for fungal load in animal feed (\$9.75)" you			
M5b	Yeast	Feed materials \leq 12% moisture content or aw- value \leq 0,95	10 ⁶ CFU/g		can read the foundation of the new standards and the suggestions for analysis methods.			
		Feed materials \ge 12% moisture content or aw- value \ge 0,95	-					



Chemical hazards

Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Mycotoxin				
C1	Aflatoxin B1	Feed materials intended for (direct) delivery to dairy farmers	-	0,005 mg/kg	
		Feed materials	-	0,02 mg/kg	
		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	

5. <u>Action limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements	
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶					
C2	Aldrin Dieldrin	Feed materials and compound feed, with the exception of:	-	0,01 mg/kg	Maximum level for aldrin and dieldrin, singly or combined, expressed as dieldrin.	
	(Singly or combined expressed as dieldrin)	• fats and oils,	-	0,1 mg/kg		
		compound feed for fish	-	0,2 mg/kg		

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.

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Heavy metals				
C3	Arsenic ⁷	Feed materials, with the exception of:	-	2 mg/kg	
		 meal made from grass, from dried lucerne and from dried clover, and dried sugar beet pulp and dried molasses sugar beet pulp; 	-	4 mg/kg	
		• palm kernel expeller;	-	4 mg/kg ⁸	
		• peat; leonardite;	-	5 mg/kg ⁸	
		phosphates and calcareous marine algae;	-	10 mg/kg	
		 calcium carbonate; calcium and magnesium carbonate ⁹; calcareous marine shells; 	-	15 mg/kg	
		• magnesium oxide and magnesium carbonate;	-	20 mg/kg	
		fish, other aquatic animals and products derived thereof;	-	25 mg/kg ⁸	
		seaweed meal and feed materials derived from seaweed.	-	40 mg/kg ⁸	
		Iron particles used as tracer	-	50 mg/kg	
		Feed additives belonging to the functional group of compounds of trace elements except:	-	30 mg/kg	
		 cupric sulphate pentahydrate; cupric carbonate; dicopper; chloride trihydroxide; ferrous carbonate; dimanganese chloride trihydroxide; 	-	50 mg/kg	

	1	1
• zinc oxide, manganous oxide and cupric oxide.	-	100 mg/kg
Complete feed, with the exception of:	-	2 mg/kg
complete feed for fish and fur animals;	-	10 mg/kg ⁸
 complete feed for pet animals containing fish, other aquatic animals and products derived thereof and/or seaweed meal and feed materials derived from seaweed. 	-	10 mg/kg ⁸
Complementary feed, with the exception of:	-	4 mg/kg
• mineral feed;	-	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; 	-	10 mg/kg ⁸
 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. 	-	30 mg/kg

<u>Rejection limit</u>: 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.

7. The maximum levels refer to the total level of arsenic.

8. 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

9. Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in the European Catalogue of feed materials.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements		
Chem	hemical: Other undesirable substances and products						
C4	Hydrocyanic acid	Feed materials, with the exception of:	-	50 mg/kg			
		• linseed;	-	250 mg/kg			
		Iinseed 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			

5. 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. <u>Rejection limit</u>: 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 differently.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemical:	Heavy metals				
C6	Cadmium	Feed materials of vegetable origin	-	1 mg/kg	
		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 ¹⁰	
		Complementary feed with the exception of:	-	0,5 mg/kg	
		Mineral feed	-		
		• containing < 7% phosphorus ¹¹	-	5 mg/kg	
		• containing \geq 7% phosphorus ¹¹	-	0,75 mg/kg per 1% phosphorus ¹¹ , 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	

<u>Rejection limit</u>: 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.

10. 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.

11. The % of phosphorus is relative to a feed with a moisture content of 12 %.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Salts				
С7	Chloride	• Feed materials for delivery to livestock farms, and;	10 g/kg (dry		If the action limit is exceeded then a
		Wet mixes for delivery to livestock farmers	matter)		warning or processing advice must be
					<i>demonstrably communicated</i> 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 Support document (S9.72) <u>Salts</u>
					in rations with wet feeds for fattening pigs
					and sows



Code	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements			
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶							
C8	Camphechlor (toxaphene) – sum of the indicators CHB 26, 50 and 62 ¹²	Fish, other aquatic animals and products thereof with the exception of fish oil:	-	0,02 mg/kg				
		• fish oil	-	0,2 mg/kg				
		Complete feed for fish	-	0,05 mg/kg				

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.

<u>Rejection limit</u>: 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.

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

12. 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements			
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶							
С9	Chlordane (sum of cis- and transisomers and of oxychlordane	Feed materials and compound feed with the exception of:	-	0,02 mg/kg				
	expressed chlordane)	fats and oils	-	0,05 mg/kg				

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.

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements			
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶							
	DDT (sum of DDT-, DDD- (or TDE-) and DDE-isomers, expressed as DDT)	Feed materials and compound feed with the exception of:	-	0,05 mg/kg				
		fats and oils	-	0,5 mg/kg				

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.

<u>Rejection limit</u>: 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.



Co	ode	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements		
CI	Chemical: Other undesirable substances and products							
C	12	Prohibited Animal proteins (Restricted animal proteins)	Animal feeds for productive livestock	-	0	See TS 1.4 Forbidden Products and Fuels		



Code	Contaminant	Product	Action limit 5 + 13	Rejection limit 5 + 13	Supplementary requirements
Chemi	cal: Toxic substances	1		1	
C13a	Dioxin (sum of polychlorinated dibenzo-para-	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	In the event of exceeding the action limit: Identification of source of contamination. Once source is identified,
	dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) expressed in World Health Organisation (WHO) toxic	Vegetable oils and their by-products	0,5 ng WHO- PCDD/F-TEQ/kg	0,75 ng WHO- PCDD/F-TEQ/kg	take appropriate measures, where possible, to reduce o eliminate source of contamination.
	equivalents, using the WHO-TEFs (toxic equivalency factors, 2005))	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	In the event of exceeding the action limit: In many case it might not be necessary to perform an investigation
		Fish, other aquatic animals and products derived thereof, with the exception of fish oil and hydrolysed fish protein containing more than 20% fat ¹⁴ and crustacean meal.	0,75 ng WHO- PCDD/F-TEQ/kg	1,25 ng WHO- PCDD/F-TEQ/kg	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, information ₇ such as sampling period, geographical
		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	origin, fish species, etc., shall be recorded with a view t future measures to manage the presence of dioxins an dioxin-like compounds in the materials for animal nutrition.
		Feed additives belonging to the functional groups of binders and anti-caking agents ¹⁵	0,5 ng WHO- PCDD/F-TEQ/kg	0,75 ng WHO- PCDD/F-TEQ/kg	In the event of exceeding the action limit: Identification of source of contamination.



		Feed additives belonging to the functional group of compounds of trace elements. Premixtures Compound feeds with the exception of:	0,5 ng WHO- PCDD/F-TEQ/kg 0,5 ng WHO- PCDD/F-TEQ/kg 0,5 ng WHO-	1,0 ng WHO- PCDD/F-TEQ/kg 1,0 ng WHO- PCDD/F-TEQ/kg 0,75 ng WHO-	Once source is identified, take appropriate measures, where possible, to reduce or eliminate source of contamination.
		compound feed for pet animals and fish;	PCDD/F-TEQ/kg 1,25 ng WHO- PCDD/F-TEQ/kg	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
		compound feed for fur animals.	-	-	nutrition.
C13b	Sum of dioxins and dioxin-like PCBs (sum of polychlorinated dibenzo- para- dioxins (PCDDs), polychlorinated	Feed materials of plant origin with the exception of vegetable oils and their by-products	-	1,25 ng WHO- PCDD/F-PCB- TEQ/kg	
	dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs) expressed in World Health Organisation (WHO) toxic equivalents, using the	Vegetable oils and their by-products	-	1,5 ng WHO- PCDD/F-PCB- TEQ/kg	
	WHO-TEFs (toxic 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 ¹⁴; 	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
Feed additives belonging to the functional groups of binders and anti-caking agents ¹⁶	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;		5,5 ng WHO- PCDD/F-PCB- TEQ/kg	
		Compound feed for fur animals.	-	-	
C13c	Dioxin-like PCBs * (sum of polychlorinated biphenyls	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
	(PCBs) expressed in World Health Organisation (WHO) toxic equivalents, using the WHO- TEFs (toxic equivalency factors, 2005)	Vegetable oils and their by-products	0,5 ng WHO- PCB-TEQ/kg		identified, take appropriate measures, where possible reduce or eliminate source of contamination.
		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		
		 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		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

	 Fish, other aquatic animals and products derived thereof with the exception of fish oil and fish protein, hydrolysed, containing more than 20% fat ¹⁴ Fish protein, hydrolysed, containing more than 	2,0 ng WHO- PCB-TEQ/kg 5,0 ng WHO-		dioxin-like compounds in the materials for animal nutrition.
	20% fat	PCB-TEQ/kg		
	Feed additives belonging to the functional groups of binders and anti-caking	0,5 ng WHO- PCB-TEQ/kg		In the event of exceeding the action limit: Identification of source of contamination. Once source is identified,
	Feed additives belonging to the functional group of compounds of trace elements	0,35 ng WHO- PCB-TEQ/kg		take appropriate measures, where possible, to reduce or eliminate source of contamination.
	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			
Non-dioxin-like PCBs	Feed materials of plant origin		10 μg/kg (ppb)	



C13d

ngener	TEF value	Congener		TEF value
	oxins and Dioxin- like Compounds. Toxicological Scie	-	., me 2005 W	
	oxins, furans and dioxin-like PCBs: WHO-TEFs for hu CS) expert meeting which was held in Geneva in Jun			-
	compound feed for fur animals	-		
	compound feed for pet animals and fish	40 μg/kg (opb)	
	Compound feed with the exception of:	10 µg/kg (opb)	
	Premixture	10 μg/kg (opb)	
	Feed additives belonging to the functional group c compounds of trace elements	of 10 μg/kg (opb)	
	Feed additives belonging to the functional groups binders and anti-caking agents ¹⁸	of 10 μg/kg (opb)	
	• Fish protein, hydrolysed, containing more than 20 % fat	50 μg/kg (opb)	
	 Fish, other aquatic animals and products derived thereof with the exception of fish oil and fish protein, hydrolysed, containing more than 20 % fat ¹⁷ 	30 μg/kg (opb)	
	• Fish oil;	175 μg/kg	(ppb)	
	 Other land animal products including milk and milk products and eggs and egg products; 	10 μg/kg (opb)	
	Animal fat, including milk fat and egg fat;	10 μg/kg (opb)	
138, FCB 133 and FCB 180 (ICES = 0))	Feed materials of animal origin:	10 μg/kg (opb)	
(sum of PCB 28, PCB 52, PCB 101, PCB 138, PCB 153 and PCB 180 (ICES – 6))	Feed materials of mineral origin	10 µg/kg (opb)	



Dibenzo-p-dioxins (PCDDs)		Dioxin-like PCBs		
2,3,7,8-TCDD	1	non-ortho-PCB's + mono-ortho-PCB's		
1,2,3,7,8-PeCDD	1	Non-ortho-PCBs		
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			
		Mono-ortho-PCBs		
Dibenzofuranes (PCDFs)		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			



<u>Rejection limit</u>: 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.

13. 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.

14. 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 animals proteins produced from these 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.

15. 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.

16. 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.

17. 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.

18. 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



Code	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements
Chem	ical: Mycotoxin				
C15	DON	Compound feed (on full ration basis) for:			- The European Commission has published
	(Deoxynivalenol)	• Pigs	0,8 mg/kg	1 mg/kg	"Recommendation 2006/576/EC" regarding the guidance values for this mycotoxin. GMP+ International has established other values to comply.
		• 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	
	C	• Poultry	3,2 mg/kg	4 mg/kg	
		Compound feed for lambs, kids and dogs	2 mg/kg		
		Other compound feeds	5 mg/kg		
		Feed material (supplied to the livestock farmer for immediate feeding) for 19 :			
		• 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 ¹⁹ :			
		Cereals and cereal products ²⁰ with the exception of maize by-products	8 mg/kg		
		Maize by-products	12 mg/kg		

<u>Rejection limit</u>: 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.

19. 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 daily ration

20. 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



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Crop protection agents (Pesticide	s which are not permitted in the EU) ⁶	•		·
C16	6 Endosulfan (sum of alfa and bèta- isomers and of endosulfan sulphate, expressed as endosulfan)	Feed materials and compound feed with the exception of:	-	0,1 mg/kg	
		cotton seed and products derived from the processing thereof, except crude cotton seed oil;	-	0,3 mg/kg	
		 soybean and products derived from the processing thereof, except crude soybean oil; 	-	0,5 mg/kg	
		crude vegetable oil	-	1,0 mg/kg	
		complete feed for fish except for Salmonids	-	0,005 mg/kg	
		complete feed for Salmonids	-	0,05 mg/kg	

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.

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements		
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶						
	Endrin (sum of endrin and deltaketo- endrin, expressed as endrin)	Feed materials and compound feed with the exception of:	-	0,01 mg/kg			
		fats and oils	-	0,05 mg/kg			

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	ical: Salts				
C19 Flu	Fluorine ²¹	Feed materials, with the exception of:	-	150 mg/kg	
		 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 ²²	-	350 mg/kg	
		magnesium oxide;	-	600 mg/kg	
		calcareous marine algae.	-	1 250 mg/kg	
		Vermiculite (E 561)	-	3 000 mg/kg	
		Complementary feed:			
		• containing \leq 4% phosphorus ¹¹ ;	-	500 mg/kg	
		• containing > 4% phosphorus 11 .	-	125 mg/kg per 1% phosphorus ¹¹	
		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	

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.

<u>Rejection limit</u>: 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.

11. The % of phosphorus is relative to a feed with a moisture content of 12 %.

21. 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

22. Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in the European Catalogue of feed materials.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements		
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶						
C20	Heptachlor (sum of heptachlor and heptachlor epoxyd, expressed as	Feed materials and compound feed, with the exception of:	-	0,01 mg/kg			
	heptachlor)	fats and oils	-	0,2 mg/kg			

5. 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.

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements		
Chem	Chemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶						
C21	Hexachlorobenzene (HCB)	Feed materials and compound feed, with the exception of:	-	0,01 mg/kg			
		fats and oils	-	0,2 mg/kg			

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements		
Chem	hemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶						
C22a	Hexachlorocyclohexane (HCH):						
	• Alfa-isomer	Feed materials and compound feed, with the exception of:	-	0,02 mg/kg			
		fats and oils	-	0,2 mg/kg			

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chemi	hemical: Crop protection agents (Pesticides which are not permitted in the EU) ⁶							
C22b	Hexachlorocyclohexane (HCH):							
	• Beta-isomer	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				

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Crop protection agents (Pesticides w	hich are not permitted in the EU) ⁶			
C22c	Hexachlorocyclohexane (HCH):				
	Gamma-isomer (lindane)	Feed materials and compound feed, with the exception of:	-	0,2 mg/kg	
		fats and oils	-	2,0 mg/kg	

5. 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.

<u>Rejection limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chem	hemical: Salts							
C23	Potassium	 Feed materials for delivery to livestock farms, and; Wet mixes for delivery to livestock farmers 	60 g/kg (dry matter)	-	If the action limit is exceeded then a warning or processing advice must be <i>demonstrably</i> <i>communicated</i> 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 Support document: <u>S</u> 9.72 Salts in rations with wet feed for fattening pigs and sows			

mg/kg (ppm) of the feed materials or compound feeds, derived to a moisture content of 12% unless mentioned differently.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Toxic substances				
C24	Mineral oil hydrocarbons (C10-C40)	Animal fat, with the exception of:	-	400 mg/kg (on product basic)	
		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	-	1 000 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):	-	3 000 mg/kg (on product basic)	
		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 applie



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Heavy metals				
C26	Mercury ²³	Feed materials, with the exception of:	-	0,1 mg/kg	
		 fish, other aquatic animals and products derived thereof intended for the production of compound feed for food producing animals; 	-	0,5 mg/kg	
		fish, other aquatic animals and products derived thereof, intended for the production of compound feed for dogs, cats, ornamental fish and fur animals;	-	1,0 mg/kg ²⁴	
		 fish, other aquatic animals and products derived thereof as canned wet feed material for direct feeding of dogs and cats; 	-	0,3 mg/kg	
		 calcium carbonate; calcium and magnesium carbonate⁹. 	-	0,3 mg/kg	
		Compound feed, with the exception of:	-	0,1 mg/kg	
		mineral feed;	-	0,2 mg/kg	
		compound feed for fish;	-	0,2 mg/kg	
		compound feed for dogs, cats, ornamental fish and fur animals.	-	0,3 mg/kg	



9. Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in the European Catalogue of feed materials.

23. The maximum levels refer to the total level of mercury.

24. The maximum level is applicable on wet weight basis.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Heavy metals				
C27	Lead ²⁵	Feed materials, with the exception of:	-	10 mg/kg	
		• forage ²⁶ ;	-	30 mg/kg	
		 phosphates; calcareous marine algae and calcareous marine shells; 	-	15 mg/kg	
		 calcium carbonate; calcium and magnesium carbonate ⁹; 	-	20 mg/kg	
		• yeast.	-	5 mg/kg	_
		Feed additives belonging to the functional group of compounds of trace elements, with the exception of:	-	100 mg/kg	
		• zinc oxide;	-	400 mg/kg	-
		manganous oxide, ferrous carbonate, cupric carbonate, copper (I) oxide.	-	200 mg/kg	
		Feed additives belonging to the functional group of binders and anti-caking agents, with the exception of:	-	30 mg/kg	
		clinoptilolite of volcanic origin; natrolite- phonolite.	-	60 mg/kg	
		Premixtures ¹⁰	-	200 mg/kg	
		Complementary feed, with the exception of:	-	10 mg/kg	
		• mineral feed;	-	15 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. 	-	60 mg/kg	
Complete feed	-	5 mg/kg	

<u>Rejection limit</u>: 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. Calcium and magnesium carbonate refers to the natural mixture of calcium carbonate and magnesium carbonate as described in the European Catalogue of feed materials.

10. 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.

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



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chem	Chemical: Mycotoxin							
C28	Ergot (Claviceps purpurea)	Feed materials and compound feed containing unground cereals	-	1 000 mg/kg				



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chemi	emical: Salts							
C29	Sodium	 Feed materials for delivery to livestock farms, and Wet mixes for delivery to livestock farmers. 	8 g/kg (dry matter)	-	If the action limit is exceeded then a warning or processing advice must be <i>demonstrably</i> <u>communicated</u> 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 Support document: <u>Source Source Source</u> <u>9.72 Salts in rations with wet feed for fattening</u> <u>pigs and sows</u>			



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Heavy metals				
C30	Nickel	Oils and fats from vegetable or animal origin	20 mg / kg (on a fat basis)	50 mg / kg (on a fat basis)	



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Other undesirable subs	ances and products			
C31	Nitrites	Feed materials, with the exception of:	-	15 mg/kg (expressed in sodium nitrite)	
		• 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 %.	-	-	

5. 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Harmful Botanical impurities				
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	



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Other undesirable substances and pro	oducts			
C33	Insoluble impurities	Rendered fats from ruminants	-	0,15%	



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chem	ical: Mycotoxin				
C34	Ochratoxin A	Compound feed on full ration basis for:			- The European Commission has published
		Sows and consumption pigs and piglets	0,04 mg/kg	0,05 mg/kg	recommendation 2006/576/EC regarding the guidance values for this mycotoxin. GMP+
		• Poultry	0,16 mg/kg	0,2 mg/kg	International has established other values to
		Compound feed for cats and dogs	0,01 mg/kg		comply.
		Feed material (supplied to the livestock farmer for immediate feeding) for 19 :			
		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:	25:		
		• Cereals and cereal products (^{19 + 20})	0,25 mg/kg		

5. 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.

<u>Rejection limit</u>: 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.

19. 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 daily ration

20. 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



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chemi	Chemical: Toxic substances							
C35a	Polycyclic Aromatic Hydrocarbons (PAH4)	Oils and fats excluding palm(kernel)-, coconutoil and products derived thereof	160 μg/kg (on fat basis)	200 μg/kg (on fat basis)	PAH4=sum of benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and			
		Palm(kernel)-, coconutoil and and products derived thereof	320 µg/kg (on fat basis)	400 μg/kg (on fat basis)	chrysene See the Support documents: - S9.73 <u>Elaboration of limit values for Polycyclic</u> <u>Aromatic Hydrocarbons in oil for feed based on</u> <u>the PAH4 methodology</u> - S9.74 <u>Transfer of polycyclic Aromatic</u> <u>Hydrocarbons in oil for feed to edible food</u> <u>commodities</u>			



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	ical: Antinutritional factors: Glucosides				
C38	Seeds and husks from Ricinus communis L., Croton tiglium L. and Abrus precatorius 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 ²⁷	

<u>Rejection limit</u>: 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.

27. Includes also seed husk fragments.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	cal: Salts				
C39	Sulphate	- Feed materials for delivery to livestock farms, and; - Wet mixes for delivery to livestock farmers which are preserved with sulphuric acid and not for products which by nature are rich in sulphur.	8 g/kg (dry matter)		If the action limit is exceeded then a warning or processing advice must be <i>demonstrably</i> <i>communicated</i> 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 Support document: S9.72 Salts in rations with wet feed for fattening pigs and sows



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemical: Antinutritional factors: Alkaloids					
C40	Theobromine	Complete feed, with the exception of:	-	300 mg/kg	
		complete feed for pigs;	-	200 mg/kg	
		complete feed for dogs, rabbits, horses and fur animals.	-	50 mg/kg	



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	Chemical: Antinutritional factors: Glucosides				
C41	Vinyl thiooxazolidone (5-	Complete feed for poultry with the exception of:	-	1 000 mg/kg	
	vinyloxazolidine-2-thione)	complete feed for laying hens	-	500 mg/kg	

5. <u>Action limit</u>: 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	ical: Antinutritional factors: Glucosides				
C42	Volatile mustard oil	Feed materials, with the exception of:	-	100 mg/kg (calculated as allylisothiocyanate)	
		Camelina seed and products derived thereof ²⁸ , products derived from mustard seed ²⁸ , rape seed and products derived thereof.	-	4 000 mg/kg (calculated as allylisothiocyanate)	
		Complete feed, with the exception of:	-	150 mg/kg (calculated as allylisothiocyanate)	
		Complete feeds for cattle (except calves), sheep (except lambs) and goats (except kids);	-	1 000 mg/kg (calculated as allylisothiocyanate)	
		Complete feeds for pigs (except of piglets) and poultry.	-	500 mg/kg (calculated as allylisothiocyanate)	

<u>Rejection limit</u>: 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.

28. 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	ical: Antinutritional factors: C	ther			
C43	Free gossypol	Feed materials, with the exception of:	-	20 mg/kg	
		cotton seed;	-	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	

5. 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemi	cal: Mycotoxin		•		
C44	Zearalenon	Compound feed on full ration basis for:			The European Commission has published
		sows and consumption pigs;	0,2 mg/kg	0,25 mg/kg	"Recommendation 2006/576/EC" regarding the guidance values for this mycotoxin. GMP-
		young pigs;	0,08 mg/kg	0,1 mg/kg	International has established other values to
		young cattle and dairy cattle.	0,4 mg/kg	0,5 mg/kg	comply.
		Compound feed for:			
		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 19 ;			
		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:			
		Cereals and cereal products ^{19 + 20} with the exception of maize by-products;	2 mg/kg	-	
		Maize by-products.	3 mg/kg	-	1

<u>Rejection limit</u>: 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.

19. 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 daily ration

20. 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



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chemi	emical: Other undesirable substances and products							
C46	Melamine ²⁹	Feed, with the exception of:		2,5 mg/kg	EFSA recommendation: LC-MS/MS (liquid			
		canned pet food,		2,5 mg/kg ³⁰	chromatography coupled to mass spectrometry			
		the following feed additives:						
		 guanidino acetic acid (GAA); 		20 mg/kg				
		• urea;		-				
		∘ biuret.		-				

<u>Rejection limit</u>: 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.

29. 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.

30. The maximum level is applicable to canned pet food as sold.



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements				
Chemi	emical: Pesticides (Crop protection agents)								
C62	Pesticides	Animal feed		The statutory limits of EU Regulation 396/2005 are valid.					
				See Support document S9.13 FAQ Residue of pesticides in feed					



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements			
Chemi	emical: Mycotoxin							
C109	Fumonisin B1 + B2	Feed materials: • maize and maize products ³¹	60 mg/kg		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.			
		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]			

<u>Rejection limit</u>: 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.

31. 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).



Code	Contaminant	Product	Action limit ⁵	Rejection limit ⁵	Supplementary requirements
Chemio	cal: Mycotoxin				
C113	T-2 and HT-2 toxin, Sum of	Unprocessed cereals: barley (including malting barley) and maize; 	0,2 mg/kg (on	-	Unprocessed cereals are cereals which have not undergone any physical or thermal treatment other than drying, cleaning and
		oats (with husk);	product basis) ³² 1 mg/kg (on product basis) ³²	-	sorting.
		wheat, rye and other cereals.	0,1 mg/kg (on product basis) ³²	-	
		Cereal products for feed and compound feed			
		oat milling products (husks);	2 mg/kg ³²	-	
		other cereal products;	0,5 mg/kg ³²	-	
		compound feed, with the exception of feed for cats.	0,25 mg/kg ³²	-	
		Compound feed for cats	0,05 mg/kg ³²	-	

<u>Rejection limit</u>: 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.

32. 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.



Code	Contaminant	Product	Action limit ⁵	Rejection limit	Supplementary requirements			
Chemic	Chemical: Other undesirable substances and products							
C134	Polyethylene	Fat and oil products (feed materials)		0,5 g/kg (on fat basis)	See TS 1.4 Forbidden Products and Fuels			



Physical hazards

Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements				
Physical:	ysical: Harmful Botanical impurities								
F5	Unhusked beech mast - Fagus	Feed materials and compound feed	-	Seeds and fruits of the plant					
	sylvatica L.			species listed opposite as					
				well as their processed					
				derivatives may only be					
				present in feed in trace					
				amounts not quantitatively					
				determinable					



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements			
Physical:	Physical: Harmful Botanical impurities							
F6	Chinese mustard – Brassica	Feed materials and compound feed	-	Seeds may only be				
	juncea (L.) Czern. and Coss. ssp.			present in feed in trace				
	juncea var. lutea Batalin			amounts not				
				quantitatively				
				determinable				



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements			
Physical:	Physical: Harmful Botanical impurities							
F7	Ethiopian mustard – Brassica	Feed materials and compound feed	-	Seeds may only be				
	carinata A. Braun			present in feed in trace				
				amounts not				
				quantitatively				
				determinable				



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements			
Physical:	Physical: Harmful Botanical impurities							
F8	Indian mustard - Brassica juncea	Feed materials and compound feed	-	Seeds may only be				
	(L.) Czern. and Coss. ssp.			present in feed in trace				
	integrifolia (West.) Thell.			amounts not				
				quantitatively				
				determinable				



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements			
Physical:	Physical: Harmful Botanical impurities							
C10	Crotalaria spp.	Feed materials and compound feed	-	100 mg/kg				



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements				
Physical:	nysical: Harmful Botanical impurities								
F10	Purghera - Jatropha curcas 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					



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physcial:	Physcial: Harmful Botanical impurities						
F12	Sareptian mustard - Brassica	Feed materials and compound feed	-	Seeds may only be			
	juncea (L.) Czern. and Coss. ssp.			present in feed in trace			
	juncea			amounts not			
				quantitatively			
				determinable			



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physical:	hysical: Harmful Botanical impurities						
F13	Seeds from Ambrosia spp.	Feed materials (*), with the exception of:	-	50 mg/kg			
		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			

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.



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physical:	Physical: Harmful Botanical impurities						
F14	Black mustard – Brassica nigra	Feed materials and compound feed	-	Seeds may only be			
	(L.) Koch			present in feed in trace			
				amounts not			
				quantitatively			
				determinable			



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physical	Physical: Other undesirable substances and products						
F26	Radioactivity	Feed intended for:			- Special conditions governing the import of		
	Sum of Cs-134 and Cs-137	cattle and horses;		100 (Bq/kg)	feed originating in or consigned from Japan following the accident at the Fukushima nuclear		
		• pig;		80 (Bq/kg)	power station.		
		• poultry;		160 (Bq/kg)	- In order to ensure consistency with maximum		
		• fish ³⁴ .		40 (Bq/kg)	levels currently applied in Japan, these values replace on a provisional basis the values laid		
					down in Regulation (Euratom) 2016/52.		



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physical	hysical: Bodies foreign to the product						
F30	Packaging material	 Feed materials for delivery to livestock farms, and Wet mixes for delivery to livestock farmers 	-	1.5 g/kg (dry matter basis)	Packaging materials are fibres of paper and board, fragments of plastic, aluminium foil and metal, plastic clips, metal wires, etc.		
					Via manual separation and weighing		
					See TS 1.4 Forbidden Products and Fuels		
					This norm was included subject to the outcome of the discussion taking place in the European Commission.		



Code	Contaminant	Product	Action limit ³³	Rejection limit ³³	Supplementary requirements		
Physical:	Physical: Harmful Botanical impurities						
C32a	- Datura sp.	Feed material and compound feed	-	1 000 mg/kg			



Feed Support Products

That was a lot of information to digest and one might ask, what is the next step? Luckily we can offer support for the GMP+ Community when doing this. We provide support by means of various tools and guidances but as each company has a shared responsibility to feed safety, and therefor tailor-made solutions cannot be offered. However, we do help by explaining requirements and provide background information about the requirements.

We have developed various supporting materials for the GMP+ Community. These include various tools, ranging from Frequently Asked Questions (FAQ) lists to webinars and events.

Where to find more about the GMP+ International Feed Support Products Fact sheets More information: https://www.gmpplus.org/en/services/feed-support-product

More information: https://www.gmpplus.org/en/services/feed-support-products/fact-sheets/ Review fact sheets: GMP+ Portal https://portal.gmpplus.org/en-US/tools/fsp/

Feed Support Products (FSP)

Feed Support Products (FSP) provides valuable and up-to-date information about potentially high-risk feed. The products vary from flow charts of production processes including the risks (Risk Assessments) and studies on undesirable substances (fact sheets).



We enable every company in the feed chain to take responsibility for safe and sustainable feed.

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