

Table S1. Occurrence and co-occurrence of DON and secondary metabolites ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for feed and food products.

			FOOD						FEED					
			15AcDON	15+3AcDON	3AcDON	AcDONs	DON	DON3G	15AcDON	15+3AcDON	3AcDON	AcDONs	DON	DON3G
Barley	N		5	4	6	1	22	5	1		1		3	
	Mean	LB	19.6	0.3	22.3	0.0	173.8	109.2	0.0		0.0		413.7	
	Conc	UB	21.6	1.0	26.7	0.0	173.8	109.2	50.0		50.0		413.7	
	Max Conc	UB	97.0	1.0	120.0	0.0	2029.0	390.0	50.0		50.0		600.0	
Cereals	N		17		24		21	6					2	
	Mean	LB	9.3		14.3		46.9	22.8					543.0	
	Conc	UB	13.1		17.4		50.1	24.2					543.0	
	Max Conc	UB	119.0		130.0		132.1	29.0					884.0	
Maize	N		15		5		59	15	51		51	2	196	72
	Mean	LB		186.3	6.2		256.3	0.0	87.1		26.1	108.0	714.9	112.1
	Conc	UB		188.6	6.7		263.2	5.3	88.1		27.1	110.5	735.6	117.0
	Max Conc	UB		808.1	31.0		2266.8	5.3	1047.0		339.0	211.0	9528.0	763.0
Oat	N		21		24		31	6	2		4		6	2
	Mean	LB	6.6		28.5		130.6	34.2	24.5		127.0		1309.7	711.0
	Conc	UB	10.8		30.6		132.6	36.8	49.5		139.5		1309.7	711.0
	Max Conc	UB	27.0		116.0		1230.0	97.0	50.0		341.0		2690.0	806.0
Rice	N				4		22						1	
	Mean	LB			0.0		7.9						800.0	
	Conc	UB			0.6		15.6						800.0	
	Max Conc	UB			0.6		96.0						800.0	
Rye	N		2		5		11						2	

	Mean	LB	0.5		8.6		55.9					56.2	
	Conc	UB	3.0		13.6		56.8					56.2	
	Max Conc	UB	5.0		43.2		277.0					83.1	
	N		16	23	22		162	33	19		19	1	41
Wheat	Mean	LB	6.0	2.8	8.0		140.1	18.1	139.1		11.9	16.0	957.7
	Conc	UB	55.9	7.5	14.6		187.9	23.6	142.6		16.4	16.0	1025.4
	Max Conc	UB	150.0	64.8	59.0		1657.0	250.0	1575.0		93.8	16.0	12270.0

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value. Blank cells refer to not available information. N: number of records.

Table S2. Occurrence and co-occurrence of FB and secondary metabolites ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for feed and food products.

			FOOD						FEED					
			FB ₁	FB ₁ +FB ₂	FB ₂	FB ₃	FB _s	FB _s +HFB _s	FB ₁	FB ₁ +FB ₂	FB ₁ +FB ₂ +FB ₃	FB ₂	FB ₃	FB _s
Barley	N		1	1	1		1		1			1		
	Mean	LB	156.3	0.0	65.0		0.0		0.0			0.0		
	Conc	UB	156.3	100.0	65.0		25.0		30.0			30.0		
	Max Conc	UB	156.3	100.0	65.0		25.0		30.0			30.0		
Cereals	N		5	1	4	1								
	Mean	LB	8.9	0.0	19.3	0.0								
	Conc	UB	9.9	100.0	20.5	5.0								
	Max Conc	UB	35.0	100.0	75.0	5.0								
Maize	N		58	13	54	23	7	6	94	13	5	85	45	37
		LB	540.7	823.8	135.6	152.6	472.8	570.0	1806.0	2611.8	7220.0	610.7	57.5	681.8

	Mean Conc	UB	541.3	823.8	141.5	156.2	473.7	570.0	1807.1	2611.8	7220.0	612.2	61.0	795.8
	Max Conc	UB	7878.7	4092.0	1563.6	1066.1	1300.5	1651.0	30200.0	7890.0	11100.0	13200.0	246.0	5727.0
Oat	N		1	1	1				1			1		
	Mean	LB	0.0	0.0	0.0				0.0			28.0		
	Conc	UB	0.1	100.0	0.5				30.0			28.0		
	Max Conc	UB	0.1	100.0	0.5				30.0			28.0		
Rice	N		3		1									
	Mean	LB	0.0		0.0									
	Conc	UB	8.4		0.5									
	Max Conc	UB	12.5		0.5									
Rye	N			1			1							
	Mean	LB		0.0			6.2							
	Conc	UB		100.0			6.2							
	Max Conc	UB		100.0			6.2							
Wheat	N		17	1	17	14	1		17			17	16	2
	Mean	LB	8.1	0.0	2.5	0.0	0.0		4.6			1.6	0.0	551.25
	Conc	UB	10.1	100.0	3.8	0.7	25.0		13.8			9.4	7.7	667.25
	Max Conc	UB	131.2	100.0	35.9	6.0	25.0		78.0			30.0	8.4	1102.5

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

Table S3. Occurrence and co-occurrence of AF and secondary metabolites ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for feed and food products.

			FOOD					FEED				
			AFB ₁	AFB ₂	AFG ₁	AFG ₂	AFs	AFB ₁	AFB ₂	AFG ₁	AFG ₂	AFs
Barley	N		3	1	1	1	5	1				
	Mean Conc	LB	0.2	0	0.1	0	0	0				
		UB	0.2	0	0.1	0	0.4	0.2				
	Max Conc	UB	0.4	0	0.1	0	1.8	0.2				
Cereals	N		13	14	14	13	1					
	Mean Conc	LB	0	0	0	0	0					
		UB	0.6	0.9	1.1	0.2	0.4					
	Max Conc	UB	3	10	5	0.4	0.4					
Maize	N		22	22	22	22	3	35	6	6	6	27
	Mean Conc	LB	1.9	0.1	0	0	3.6	9.9	1.3	2.8	1.1	4.2
		UB	2.2	0.8	0.4	0.3	3.7	9.9	1.3	2.8	1.1	5.5
	Max Conc	UB	22.4	10	5	1	10.3	74.8	3.2	14	3.2	67
Oat	N		2	2	2	2	2	1				
	Mean Conc	LB	0	0.8	0	0	0	0				
		UB	1.6	0.9	2.8	0.2	0.4	0.2				
	Max Conc	UB	3	1.6	5	0.3	0.4	0.2				
Rice	N		124	120	35	35	5					
	Mean Conc	LB	3.1	0.2	10.7	7.8	1.4					
		UB	3.3	0.5	10.9	7.8	1.5					
	Max Conc	UB	91.7	12.1	78.7	31	1.9					

Rye	N		1	1	1	1	2					
	Mean Conc	LB	0	0	0	0	0					
		UB	0.9	0.2	2.2	0.4	1.1					
	Max Conc	UB	0.9	0.2	2.2	0.4	1.8					
Wheat	N		34	33	33	33	4	24	9	9	9	
	Mean Conc	LB	0	0	0.2	0	0.7	7.4	0	0	0	
		UB	0.6	0.1	1.1	0.3	0.9	7.6	0.2	0.2	0.2	
	Max Conc	UB	3	0.2	6.6	0.9	2.6	143.6	0.3	0.3	0.3	

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

Table S4 a. Occurrence and co-occurrence of ZEN and secondary metabolites ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for food products.

			FOOD											
			αZEL	αZEL14G	αZEL4G	βZEL	βZEL14G	βZEL4G	ZEN	ZEN14G	ZEN14S	ZEN16G	ZEN4G	ZEN4S
Barley	N		3	1		3	1		19	1	1	1		
	Mean Conc	LB	0.2	2.9		0.7	0.7		26.3	2.7	10.6	0.3		
		UB	9.9	2.9		11.7	0.7		26.4	2.7	10.6	0.9		
	Max Conc	UB	27.0	2.9		31.0	0.7		192.0	2.7	10.6	0.9		
Cereals	N		6		5	6		5	18				5	6
	Mean Conc	LB	32.7		0.0	24.7		0.0	10.6				9.6	4
		UB	34.7		9.0	28.5		9.0	11.5				14.4	13.2
	Max Conc	UB	110.0		9.0	86.0		9.0	53.0				20.0	24
Maize	N		15						37					

	Mean	LB	0.0						80.6					
	Conc	UB	2.5						82.1					
	Max Conc	UB	2.5						823.0					
Oat	N		8		7	8		7	26			7	6	
	Mean	LB	16.1		0.0	19.5		2.9	11.4			3.4	2.0	
	Conc	UB	19.5		9.0	24.1		10.6	13.0			11.4	11.2	
	Max Conc	UB	68.0		9.0	96.0		20.0	85.0			16.0	12.0	
Rice	N								7					
	Mean	LB							0					
	Conc	UB							6.6					
	Max Conc	UB							10.1					
Rye	N		1			1			7					
	Mean	LB	0.0			0.0			7.0					
	Conc	UB	2.0			2.0			7.3					
	Max Conc	UB	2.0			2.0			41.0					
Wheat	N		22	1	6	9	1	6	165	1	1	1	6	6
	Mean	LB	3.2	3.1	0.0	18.2	0.0	0.0	24.2	0.6	4.9	2.1	2.7	3.7
	Conc	UB	5.7	3.1	9.0	22.3	0.2	9.0	27.0	0.6	4.9	2.1	10.7	11.0
	Max Conc	UB	39.0	3.1	9.0	104.0	0.2	9.0	856.0	0.6	4.9	2.1	16.0	11.0

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

			FEED												
			α ZEL	α ZEL14G	α ZEL4G	β ZEL	β ZEL14G	β ZEL4G	ZEN	ZEN14G	ZEN14S	ZEN16G	ZEN4G	ZEN4S	
Barley	N		3												
	Mean	LB							16.3						
		Conc	UB							16.3					
	Max Conc	UB							27.0						
Cereals	N		5												
	Mean	LB							79.9						
		Conc	UB							79.9					
	Max Conc	UB							134.0						
Maize	N		2	2				122							
	Mean	LB	9.0				91.5			93.3					
		Conc	UB	9.0				91.5			94.9				
	Max Conc	UB	15.0				166.0			2180.0					
Oat	N		2	1	2			1	5	1	1	1			
	Mean	LB	69.0	0.0			1.5	0.0		44.2	0.1	31.6	4.2		
		Conc	UB	69.0	0.5			17.0	0.2		44.2	0.3	31.6	4.2	
	Max Conc	UB	136.0	0.5			31.0	0.2		77.0	0.3	31.6	4.2		
Rice	N														
	Mean	LB													
		Conc	UB												
	Max Conc	UB													
Rye	N														

	Mean	LB												
	Conc	UB												
	Max Conc	UB												
Wheat	N		7						24					
	Mean	LB	3.5						84.6					
	Conc	UB	4.1						85.7					
	Max Conc	UB	10.0						555.0					

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

Table S5. Occurrence and co-occurrence of T2-HT2 and secondary metabolites ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for feed and food products.

			FOOD						FEED					
			T2 tetraol	T2 triol	T2G	T2+HT2	HT23G	HT2G	T2 tetraol	T2 triol	T2G	T2+HT2	HT23G	HT2G
Barley	N		2	2		48	1				18	45		18
	Mean Conc	LB	51.4	10.3		27.3	3.6				2.4	53.3		48.2
		UB	51.4	10.3		30.8	10.8				2.4	55.6		48.2
	Max Conc	UB	102.7	20.4		264.0	10.8				14.5	213		162.8
Cereals	N					58						13		
	Mean Conc	LB				2.8						27.7		
		UB				9.7						27.8		
	Max Conc	UB				60.0						65.1		

Maize	N		53					3		2		174		
	Mean Conc	LB				1.8			117.7	42		44.8		
		UB				5.4			117.7	42		49.2		
	Max Conc	UB				60.0			301	76		2300		
Oat	N		1	13	65			1		1		17	1	
	Mean Conc	LB	3.6	20.3		179.9			150	19		88.1	41.4	
		UB	3.6	21.9		182.5			150	19		96.9	41.4	
	Max Conc	UB	3.6	122		2570.0			150	19		196	41.4	
Rice	N		14					1						
	Mean Conc	LB				0.0						76		
		UB				8.9						76		
	Max Conc	UB				60.0						76		
Rye	N		1	1	18									
	Mean Conc	LB	1.8	0		11.9								
		UB	1.8	1		15.0								
	Max Conc	UB	1.8	1		90.0								
Wheat	N		2	2	116			1	1		41			
	Mean Conc	LB	4.8	0.3		7.7	15		38			15.6		
		UB	4.8	0.8		15.8	15		38			21.9		
	Max Conc	UB	9.2	1		123.0	15		38			135		

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

Table S6. Occurrence and co-occurrence of NIV, NIV3G and OTA ($\mu\text{g/kg}$) for Barley, Cereals, Maize, Oat, Rice, Rye and Wheat for feed and food products.

			FOOD			FEED		
			NIV	NIV3G	OTA	NIV	NIV3G	OTA
Barley	N		16	1	6			5
	Mean Conc	LB	35.2	25.2	1.0			10.0
		UB	40.2	25.2	1.1			12.0
	Max Conc	UB	180.0	25.2	5.6			25.7
Cereals	N		16		22			
	Mean Conc	LB	3.3		0.4			
		UB	5.5		0.4			
	Max Conc	UB	35.8		2.2			
Maize	N		21		32	89		68
	Mean Conc	LB	9.3		0.3	190.6		2.2
		UB	28.3		0.6	210.0		2.7
	Max Conc	UB	175.7		4.8	2547.0		51.0
Oat	N		20		4	3	1	1
	Mean Conc	LB	81.4		0.1	263.3	36.9	0.0
		UB	86.3		0.5	280.0	36.9	10.0
	Max Conc	UB	208.0		1.0	635.0	36.9	10.0
Rice	N		5		44			
	Mean Conc	LB	0.0		2.0			
		UB	16.0		2.0			
	Max Conc	UB	75.0		27.3			

Rye	N		9		5			4
	Mean Conc	LB	12.0		0.8			6.5
		UB	14.6		0.9			6.5
	Max Conc	UB	56.9		2.1			14.5
Wheat	N		47	1	50	19		24
	Mean Conc	LB	54.8	23.1	0.5	58.2		12.7
		UB	75.2	23.1	0.8	79.2		13.4
	Max Conc	UB	302.4	23.1	3.9	690.0		267.0

LB: lower-bound scenario where the concentration of non-detected analyte is zero and the concentration of detected but non-quantified analyte is the limit of detection. UB: upper-bound scenario where the concentration of non-detected analyte is the limit of detection and the concentration of detected but non-quantified analyte is the limit of quantification. Max Conc refers to maximum upper bound concentration value.

Table S7. Equivalent mycotoxin (parent and modified) concentration in food (cereal-food based products) at country level in Europe.

	AFeq (µg/kg)			DONeq (µg/kg)			FBeq (µg/kg)			NIVeq (µg/kg)			OTAeq (µg/kg)			T2+HT2eq (µg/kg)			ZENeq (µg/kg)		
	LB	MEAN	UB	LB	MEAN	UB	LB	MEAN	UB	LB	MEAN	UB	LB	MEAN	UB	LB	MEAN	UB	LB	MEAN	UB
AT	0.2	0.3	0.3	130.6	202.1	293.6															
BA																38.3	42.1	46.0			
BE				84.0	85.3	87.4										15.7	17.6	24.5	169.6	220.1	275.5
CZ				33.6	33.7	33.8				13.8	13.8	13.8				35.7	35.7	35.7	1.2	1.3	1.4
DE	0.1	0.3	0.4	207.2	207.4	207.6	126.0	126.0	126.0	178.8	190.5	202.2				28.3	28.3	28.3	24.4	24.4	24.4
DK				78.4	78.4	78.4	19.4	19.8	20.2	14.3	14.3	14.3				22.2	22.2	22.2	1.0	1.0	1.0
ES	7.3	7.6	8.0	62.2	65.7	69.4	96.5	97.6	98.7	6.6	12.1	17.7	2.2	2.2	2.3	2.6	8.1	14.2	2.2	5.3	8.5
FI				241.7	242.0	243.0				48.5	48.5	48.5				31.2	31.6	32.6	5.4	5.4	5.4
FR	0.1	0.1	0.2	23.7	24.6	25.4	20.2	20.2	20.2	2.2	2.8	3.3	0.0	0.0	0.0	0.8	1.2	1.6	1.5	1.5	1.5
GB	1.1	1.1	1.1	83.3	83.4	86.3	0.0	2.5	5.0	76.1	76.1	76.4				204.7	204.8	205.2	21.9	22.6	23.2
HR																31.8	35.6	39.5			
IE																53.5	53.5	53.5			
IT	0.5	0.5	0.5	24.7	25.6	26.5	193.0	193.0	193.0	36.7	36.7	36.7	0.1	0.2	0.2	35.4	36.2	37.0	1.3	2.2	3.0
LT																					
LV				145.5	145.5	145.5										10.7	10.7	10.7	7.1	7.1	7.1
MK				171.4	214.3	257.1															
PL	0.0	0.0	0.0	40.4	41.2	42.7	183.3	185.7	190.0	34.2	36.3	38.3	0.4	0.4	0.4	11.1	11.8	12.6	2.0	2.0	2.1
PT	0.0	0.1	0.3	3.8	26.3	52.7	0.0	6.3	12.5	9.4	15.7	31.3	0.2	0.2	0.3	0.0	0.4	0.8	8.8	11.4	14.0
RO				82.5	112.2	141.9	58.4	58.4	58.4	0.0	75.0	150.0				2.6	23.4	44.2	87.0	87.9	88.9
RS	0.0	0.3	0.6	42.8	43.7	44.6	0.0	0.0	0.0	0.0	2.5	5.0	0.0	1.1	2.1	6.4	7.2	8.0	0.7	1.1	1.5
SE	5.1	5.1	5.1	1155.0	1155.0	1155.0				123.0	123.0	123.0				50.0	50.0	50.0			

SI	0.0	0.2	0.4	377.7	380.0	382.3	1169.0	1204.9	1240.6		0.6	0.8	1.0	7.3	18.4	29.6	264.7	264.7	264.7
TR	0.5	0.8	1.1				326.7	332.9	339.2		1.2	1.2	1.3						

Countries are reported in ISO Alpha2-CODE. For each mycotoxin Lower Bound (LB), Mean and Upper Bound (UB) concentrations are reported. Within the modified mycotoxins a Relative Potency Factor was applied accordingly to [1-3]

1. EFSA. Risks for animal health related to the presence of zearalenone and its modified forms in feed. *EFSA Journal* **2017**, *15*, 4851, doi:10.2903/j.efsa.2017.4851.
2. EFSA. Risks to human and animal health related to the presence of deoxynivalenol and its acetylated and modified forms in food and feed. *EFSA Journal* **2017**, *5*, 4718, doi:10.2903/j.efsa.2017.4718.
3. EFSA. Risks for animal health related to the presence of fumonisins, their modified forms and hidden forms in feed. *EFSA Journal* **2018**, *16*, 5242, doi:10.2903/j.efsa.2018.5242.