



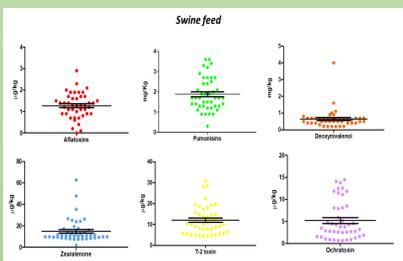
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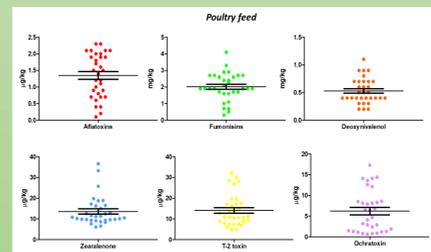
Mycotoxin occurrence in samples of cereals and feed from South Eastern Romania between 2021-2022

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Mycotoxins are naturally occurring toxins produced by fungus and can contaminate a variety of different crops and foodstuffs including cereals, nuts, spices, dried fruits, apples and coffee beans (Aasa et al., 2022). Mycotoxins can cause a variety of adverse health effects and pose a serious health threat to both humans and livestock (Marin & Taranu, 2022). The present study has investigated the contamination with mycotoxins cereals and feed, mainly from the southern region of Romania between 2021-2022. The concentration of six mycotoxins (aflatoxins - AF, fumonisins - FB, deoxynivalenol- DON, zearalenone - ZEN, toxin T2, ochratoxin A - OTA) were determined by ELISA in a number of 173 samples, of which 103 combined feeds, 38 protein-vitamin-mineral concentrates, 51 cereals, cereals and cereal by-products.



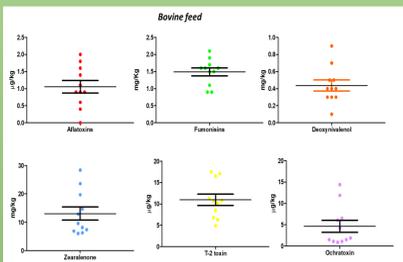
> The mycotoxin contamination of the feed compound samples for pigs was within the limits of EU legislation, with the exception of deoxynivalenol where the maximum value was 1.6 ppm vs 0.9 ppm recommended as guidance value.



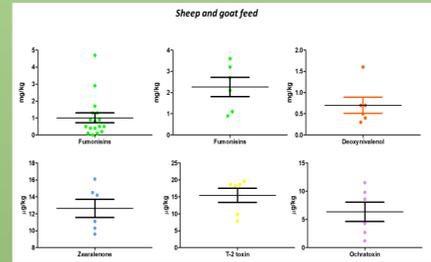
> The contamination with mycotoxins of the combined feed for chickens and laying hens was within the limits of the regulations and recommendations of the legislation in force.

Swine feed	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	1.27	1.88	0.56	14.99	12.05	5.23
Minimum value	0.1	0.3	0.2	1.90	5.70	0.70
Maximum value	2.9	3.6	1.6	47.70	30.80	14.50
No of analysed samples	44	44	44	44	44	44

Poultry feed	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	1.35	2.01	0.53	13.62	14.13	6.22
Minimum value	0.20	0.30	0.20	6.10	4.90	0.70
Maximum value	2.30	2.70	1.10	33.30	30.14	17.30
No of analysed samples	32	32	32	32	32	32



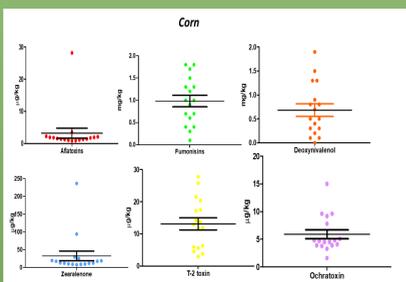
> In the case of feed for taurine the contamination with mycotoxins did not exceed the limits of the regulations and recommendations of the legislation in force.



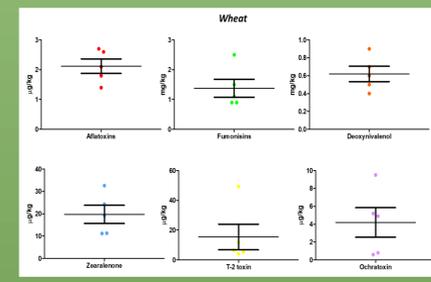
> In the case of feed for sheep and goats, Directive 2003/100/EC stipulates a maximum content of 5 ppb in feed intended for dairy animals, which corresponds to the maximum value of NC contamination for sheep and goats.

Bovine feed	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	1.05	1.49	0.44	13.07	10.96	4.65
Minimum value	0.00	0.90	0.10	6.10	4.90	0.90
Maximum value	1.80	1.90	0.70	28.40	4.90	0.90
No of analysed samples	11	11	11	11	11	11

Sheep and goat feed	Mycotoxins (µg/kg)					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	2.52	2.27	0.70	12.63	15.47	6.35
Minimum value	1.20	0.90	0.30	9.60	7.90	1.20
Maximum value	5.00	3.60	1.60	16.10	19.60	11.50
No of analysed samples	6	6	6	6	6	6



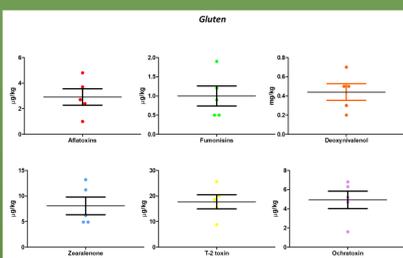
> For DON, the maximum value was 1.9 ppm, higher than the 1.75 ppm value established by EC Recommendation 1126/2007. The maximum value of contamination of corn samples with OTA was 15 ppb, which represents a value three times higher than the maximum level allowed for OTA in unprocessed cereals according to EC Regulation no 1881/2006



> The maximum value of contamination of wheat samples with OTA was 9.5 ppb, which represent a higher value compared to the value of 5 ppb accepted for the concentration of OTA in unprocessed cereals according to EC Regulation no 1881/2006.

Corn	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	3.2	1.0	0.7	32.3	13.1	5.9
Minimum value	0.8	0.1	0.1	7.5	2.9	1.6
Maximum value	28.2	1.8	1.9	236.3	27.8	15.0
No of analysed samples	17.0	17.0	17.0	17.0	17.0	17.0

Wheat	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	2.1	1.4	0.6	19.7	15.4	4.2
Minimum value	1.4	0.9	0.4	32.6	4.2	0.6
Maximum value	2.7	0.9	0.4	32.6	49.3	9.5
No of analysed samples	5	5	5	5	5	5



> The maximum value of contamination of gluten samples for AF was 4.8 ppb, which is a higher value than the value of 4 ppb (EC Regulation 165/2010) accepted by the legislation in force for the maximum concentration of AF that can be allowed in cereals. Also, the maximum value of OTA contamination was 9.5 ppb, which is a higher value than the 3ppb value accepted for the concentration of OTA in products derived from unprocessed cereals according to EC Regulation no 1881/2006.

Gluten	Mycotoxins					
	AF(µg/kg)	FB(mg/kg)	DON(mg/kg)	ZEA(µg/kg)	T2(µg/kg)	OTA(µg/kg)
Mean value	2.9	1.0	0.4	8.1	17.7	4.9
Minimum value	1.0	0.9	0.2	4.9	8.8	1.6
Maximum value	4.8	1.9	0.7	13.2	25.6	6.8
No of analysed samples	5	5	5	5	5	5

CONCLUSION Our results have shown that the concentration of the majority of the samples of and feed cereals were within the limits of EU legislation; however, some of the samples were contaminated with mycotoxins in concentrations higher than the maximum limits accepted by the in-force legislation.

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