

Mycotoxin UK & Ireland wheat survey 2014

Author: Radka Borutova; Business development manager at NutriAd International

Mycotoxins are highly toxic secondary metabolic products of moulds. Mycotoxin producing moulds damage crops and can cause great economic losses at all levels of food and feed production. Moreover, many of the mycotoxins impair health, cause diseases and death in humans and animals which consume contaminated food or feed products. This year's continental European maize harvest has shown increased contamination with the mycotoxins deoxynivalenol (DON) and zearalenone (ZEN). The levels of both these mycotoxins in some samples of corn harvested in Eastern and Central Europe reached such critical values that it would not be safe to feed that corn to sows and piglets and special care should be taken also in dairy cows and calves.

The NutriAd Mycotoxin Survey covers 55 samples from all over Great Britain and Ireland. More than 300 analyzes were conducted to test for the occurrence of the six mycotoxins most frequently found in agricultural commodities intended for animal production. The survey provides an insight into the incidences of aflatoxins (Afla), zearalenone (ZEN), deoxynivalenol (DON), T-2 toxin, fumonisin B₁ (FB₁) and ochratoxin A (OTA) across all regions of the UK and Ireland. All analyzed samples were wheat. Typically, wheat levels of DON and zearalenone tend to be lower in northern England and Scotland; moderate in western England, Wales and Ireland and highest in southern and south-eastern England. All samples (55) were collected almost immediately after the harvest and the probability that some storage mycotoxins will have developed (OTA) was low. Wheat samples were sampled directly from farms or animal feed production sites.

Sample providers were advised to follow the principles of good sampling (Richard, 2000). However, analytical personnel and/or laboratory staff were not involved and, therefore, did not influence any part of this procedure. All six mycotoxins were analyzed by liquid chromatography tandem mass spectrometry (LC MS/MS). For the purpose of data analysis, non-detection levels were based on the limits of quantification (LOQ) of the test method for each mycotoxin: AfB₁ < 0.5 µg/kg; ZEN < 10 µg/kg; DON < 75 µg/kg; FB₁ < 125 µg/kg; OTA < 1 µg/kg and T-2 toxin < 4 µg/kg.

Results

The results show that 22% of wheat samples were contaminated with DON and none of the samples contained AfB₁. Only 2% of samples contained OTA and FB₁ but this result was expected as it is well known that OTA is a typical storage mycotoxin and FB₁ is preferably produced on maize. The average concentrations of all recovered mycotoxins were low while the highest concentration of DON found in one of the samples reached only 280 µg/kg. Although 9% of the samples contained T-2 toxin, a mycotoxin extremely toxic for poultry, its maximum concentration reached only 11 µg/kg and this level is negligible.

Table 1 - Mycotoxin contamination of wheat in UK

UK samples (n=55)	AfB ₁	DON	ZEN	T-2 toxin	OTA	FB ₁
% of positive	0	22	4	9	2	2
Average of positive [µg/kg]	0	148	20.5	7	3.4	126
Maximum [µg/kg]	0	280	28	11	3.4	126

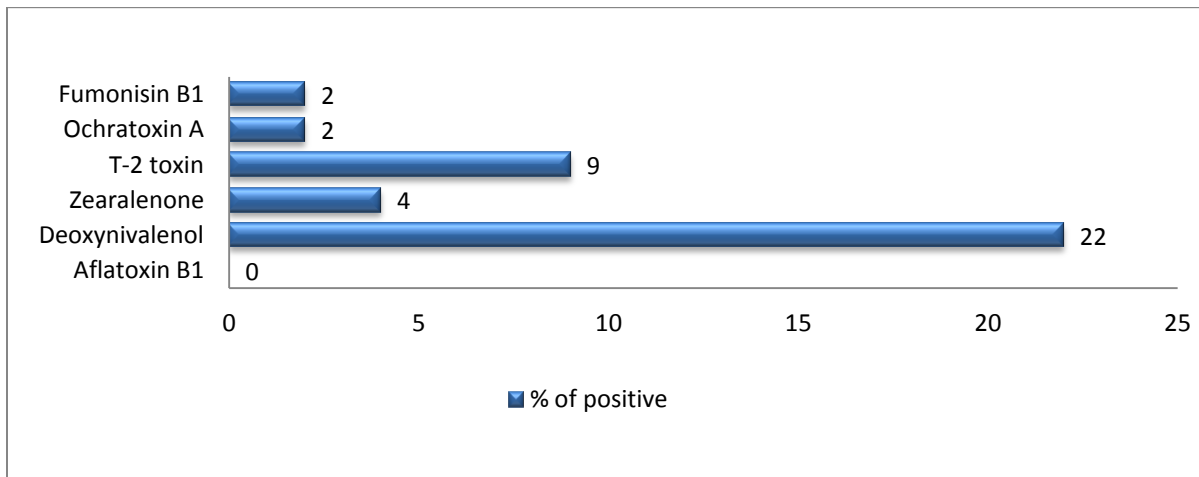


Figure 1 - Percentage of positive samples (>LOQ)

Conclusion

The NutriAd wheat mycotoxin survey concludes that this year's harvest of wheat in the UK and Ireland is of very good quality in terms of mycotoxin contamination. Based on the results of this survey conducted immediately after the 2014 harvest we believe that this year's wheat crop in the UK and Ireland might be considered safe for inclusion into finished feed rations for all animal species.

Vigilance is always advisable however as cereals in animal feeds originate from many sources and some continental European cereals harvested in 2014 have been shown to be highly contaminated with mycotoxins. The last possible line of defense is the detoxification of mycotoxins *in vivo*. The addition of proven mycotoxin deactivators to animal feeds is a very common method to prevent mycotoxicosis and is an effective strategy to keep mycotoxin risk low under any and all conditions.

References

Richard, J., 2000. Sampling and sample preparation for mycotoxin analysis. Romer® Labs Guide to Mycotoxins. 2. Romer® Labs Inc., 1301 Stylemaster Drive, Union, MO, USA 63084-1156.