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## Worldwide occurrence of mycotoxins in feedstuffs and feed in 2010

U. Hofstetter\*, I. Rodrigues and K. Naehrer  
BIOMIN Holding, Herzogenburg, Austria.

### Introduction

The occurrence of mycotoxins is known to be ubiquitous and related to many deleterious effects on humans and animals. Several scientific papers focus on the effects of one or combinations of mycotoxins in animals, usually ascertained by trials carried out with artificially contaminated diets. Studies on the actual contamination likely to be found in practical feedstuffs and feed are not common as the majority of surveys analyse food intended for human consumption, or focus on a certain country or region, on a certain commodity, and usually the amount of samples tested is too small to allow generalizations.

### Material and Methods

This work on the 12-months period between January 2010 and December 2010 during which a total of 3,349 samples were analyzed and in total 6,488 analyses were carried out for the most important mycotoxins in terms of agriculture and animal production – aflatoxins (Afla), zearalenone (ZON), deoxynivalenol (DON), fumonisins (FUM) and ochratoxin A (OTA). Samples were originated from different regions, namely America (North and South), Asia (South-East, South and North), Australia and Oceania, Europe and Middle East. Samples tested were diverse, ranging from cereals such as corn, wheat, barley and rice to processing by-products, namely soybean meal, corn gluten meal, dried distillers grains with soluble (DDGS) and other fodder such as straw, silage and finished feed. 70% of the samples were analyzed by HPLC, 30% by ELISA and approximately 9% of the samples were submitted to a TLC method. For the purpose of data analysis, non-detection levels were based on the quantification limits (LOQ) of the test method for each mycotoxin.

Non-detect levels for HPLC: Afla <0.5 µg/kg, ZON <10 µg/kg, DON <150 µg/kg, FUM <25 µg/kg and OTA <1µg/kg.

Non-detect levels for ELISA: Afla <1µg/kg, ZON <40µg/kg, DON <250 µg/kg, FUM <250 µg/kg and OTA <2µg/kg.

Non-detect levels for TLC: DON <100/<500 µg/kg (depending if cereal grains or complex matrices, such as corn silage).

### Results

According to the total analyzed samples, DON is the most incident mycotoxin worldwide, representing 58% of the analyzed samples at median levels of 520µg/kg. Also ZON and FUM were found in 42% and 55% of the analyzed samples at median levels of 89µg/kg and 933µg/kg, respectively (Table1). It is obvious that mycotoxins are an ubiquitous problem as 76% of the analyzed samples show the presence of, at least, one mycotoxin. From all samples sourced worldwide, only 24% were below the respective detection limits of the tested mycotoxins. The presence of more than one mycotoxin in 41% of the samples raises the attention to the problem of synergistic effects caused by multiple mycotoxins in animal feeds.

Table 1: Overview of the survey

World-wide	Afla	ZON	DON	FUM	OTA
No. of tests	1,950	2,633	2,947	2,107	1,558
% of pos.	28	42	58	55	26
Median of pos. (µg/kg)	8	89	520	933	3
Max. (µg/kg)	4,687	16,712	49,000	53,700	331
Commodity found	Corn	CGM	Wheat	Corn	Wheat
Country of origin	CN	CN	AT	Brazil	AT

### Conclusion

Monitoring mycotoxins is crucial and counteracting strategies are advisable to be accomplished. It's important to prevent the formation mycotoxins produced by of *Fusarium sp.*, like DON, ZON and FUM, on the field (by applying GAP) and protect animals from mycotoxicoses. Nowadays, it is a fact that a proper mycotoxin risk management is important and needed.