

## ***In vivo* efficacy testing of mycotoxin binders in poultry by means of a toxicokinetic study according to EFSA guidelines**

Devreese M., Osselaere A., De Baere S., De Backer P., Croubels S.

Department of Pharmacology, Toxicology and Biochemistry, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium

**email:** mathias.devreese@ugent.be

Mycotoxins are of great concern in the poultry industry, because of their economical impact and the consumers health risk. The occurrence of mycotoxins in feedstuffs in Western-Europe is very high, up to 82% (Monbaliu et al., 2010). Therefore, a lot of methods for detoxifying mycotoxins have been developed. Mycotoxin binders are the most commonly used and seems to be the most promising way of counteracting the effects of mycotoxins. To evaluate the efficacy of these mycotoxin binders, the European Food Safety Authority (EFSA) stipulates that besides *in vitro* tests, also *in vivo* tests are mandatory. Moreover, these *in vivo* tests should not be based on non-specific parameters such as growth rate and feed conversion, but on ADME studies (absorption, distribution, metabolism and excretion) (EFSA, 2010). These ADME studies, or toxicokinetic studies, are mainly based on the mycotoxin plasma concentration-time profile after oral intake of the mycotoxin with or without binder.

In this study we evaluated the effect of two commercially available mycotoxin binders on different toxicokinetic parameters of T-2 toxin, deoxynivalenol (DON) and zearalenone (ZEA). Thirty-six broiler chickens, 17-days old, were divided into six different groups as follows:

Group 1: T-2/DON + BINDER 1

Group 2: T-2/DON + BINDER 2

Group 3: T-2/DON

Group 4: ZEA + BINDER 1

Group 5: ZEA + BINDER 2

Group 6: ZEA

After a one-week acclimatisation period, the broilers were administered an oral bolus of toxin, with or without binder. Next, blood was withdrawn from the *vena metatarsalis plantaris* at different time points.

Plasma was analyzed by a validated LC-MS/MS method for DON, T-2 and ZEA (De Baere et al., 2010). To evaluate the efficacy of two mycotoxin binders, different toxicokinetic parameters were calculated, e.g. area under the plasma concentration-time curve ( $AUC_0 \rightarrow \infty$ ) (WinNonlin 5.0.1, Pharsight Corp., USA). Results will be presented at the conference.

### **Acknowledgments**

The technical assistance of J. Lambrecht was gratefully appreciated. This work was supported by the Agency for Innovation by Science and Technology in Flanders (IWT), Brussels, Belgium.

### **References**

De Baere S.; Osselaere A.; Devreese M.; Vandenbroucke V.; De Backer P.; Croubels S., 2010. Quantitative determination of deoxynivalenol and related compounds in animal plasma using LC-MS/MS as part of a toxicokinetic study. 6<sup>th</sup> conference of the World Mycotoxin Forum, Noordwijkerhout, The Netherlands.

EFSA, 2010. Statement on the establishment of guidelines for the assessment of additives from the functional group 'substances for reduction of the contamination of feed by mycotoxins'. EFSA Journal 2010, 8(7), 1693.

Monbaliu S.; Van Poucke C.; Detavernier C.; Dumoulin F.; Van de Velde F.; Schoeters E.; Van Dyck S.; Averkieva A.; Van Peteghem C.; De Saeger S., 2010. Occurrence of mycotoxins in feed as analyzed by a multi-mycotoxin LC-MS/MS method. Journal of Agricultural and Food chemistry 58, 66-71.