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

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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, metabolization 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 zearalenon (ZEA). Thirty-six broiler chickens, 17-days old, were divided into six different groups as follows:

Group 1: T-2/DON + BINDER 1	Group 4: ZEA + BINDER 1
Group 2: T-2/DON + BINDER 2	Group 5: ZEA + BINDER 2
Group 3: T-2/DON	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 Next, blood was withdrawn from the *vena metatarsea plantaris* at different time points.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.

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