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Unravelling the role of ruminal development in the biotransformation of deoxynivalenol and its acetylated derivatives: a comparative toxicokinetic approach

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Recently, a survey by Antonissen *et al.* (2014) demonstrated the presence of several mycotoxins in veal feed samples, especially in roughage and concentrate feed. Deoxynivalenol (DON) was most prevalent, contaminating 80% of the roughage samples and all of the 15 concentrate samples. Fibrous feed compounds such as roughage and cereal-based low-iron concentrates have been added to the diet to ensure a better ruminal development and improved animal welfare (Brscic *et al.*, 2010). It is suggested that an optimal rumen functioning is responsible for detoxification of several *Fusarium* mycotoxins, including DON, making ruminants less sensitive to these toxins (Fink-Gremmels, 2008). However, in veal calves on a classic milk replacer diet, ruminal development is absent, potentially making them more sensitive to mycotoxins. The aim of this study was to investigate the impact of the ruminal development on the biotransformation of DON and its acetylated derivatives (3- and 15-acetyl-DON, 3- and 15-ADON) in calves. A comparative toxicokinetic study was performed in two ruminating and two non-ruminating male calves. Each animal received respectively a bolus of DON (120 µg/kg bodyweight (BW)), 3-ADON (25 µg/kg BW), and 15-ADON (50 µg/kg BW) by intravenous (IV) injection and *per os* (PO), for each toxin in a cross-over design respecting a wash-out period of 96h. Concentrations were based on average feed intake and maximum contamination levels of the feed as

described in the survey. Following mycotoxin bolus administration, blood and urine was collected at different time points post administration. An LC-MS/MS method was developed to quantitate DON, 3-ADON, 15-ADON as well their metabolites, namely de-epoxy-DON, DON-3-glucuronide, DON-3-sulfate, DON-15-sulfate, 3-ADON-15-sulfate, 15-ADON-3-sulfate and DON-3,15-di-sulfate, in plasma and urine samples. Results of the toxicokinetic analyses will be presented at the conference.

References

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