

The impact of deoxynivalenol on pigeon health: occurrence in feed, toxicokinetics and interaction with salmonellosis

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Deoxynivalenol (DON) is one of the most frequently detected mycotoxins in feed. This study is the first to assess the exposure and impact of DON on pigeon health (*Columba livia*). Therefore, the aims were 1) to determine the occurrence of mycotoxins in pigeon feed; 2) to assess the toxicokinetic characteristics of DON in pigeons; and 3) to evaluate the impact of DON on the susceptibility of pigeons for *Salmonella* infection.

A liquid chromatography-tandem mass spectrometry (LC-MS/MS) method was used to analyse the presence of 21 mycotoxins in 10 commercially available pigeon feed samples. The results demonstrated that DON was one of the most frequently detected mycotoxins, contaminating 5 out of 10 samples (range 176.8 - 1465.9 µg/kg). For the toxicokinetic study, 10 pigeons were administered DON (0.3 mg/kg body weight) both orally and intravenously in a two-way cross-over design. Blood was collected at different time points post administration. The concentration of DON in plasma was analysed by a validated LC-MS/MS method. Toxicokinetic analysis revealed that the absolute oral bioavailability (F) of DON in pigeons was low (30.4%), and comparable to other poultry species. DON showed a rapid clearance and a rather low volume of distribution, resulting in a short elimination half-life. The low F suggests that intestinal epithelial cells are exposed to significant DON concentrations that eventually may affect intestinal translocation and colonization of bacteria. Consequently, the effect of feeding a DON contaminated diet (3.5 mg DON/kg feed) on the susceptibility for infection with a pigeon-adapted *Salmonella* Typhimurium variant

Copenhagen strain, was assessed in an experimental infection model based on Pasmans *et al.* (2003).

DON increased the severity of the macroscopic lesions related to salmonellosis in small intestine, liver, spleen and kidneys, however, without showing an effect on the *Salmonella* numbers in these organs.

References

Pasmans F. et al. (2003) Host adaptation of pigeon isolates of *Salmonella enterica* subsp. *enterica* serovar Typhimurium variant Copenhagen phage type 99 is associated with enhanced macrophage cytotoxicity. *Infect Immun* 71, 6068-6074.