The mycotoxin deoxynivalenol predisposes for the development of necrotic enteritis in broilers

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Clostridium perfringens induced subclinical necrotic enteritis (NE) causes important economic losses in the broiler industry. *Fusarium* mycotoxins, like deoxynivalenol (DON), may affect the intestinal epithelial integrity. The objective of this study was to examine whether DON at contamination levels below the maximum guidance level in poultry feed is a predisposing factor for NE in broilers.
In this study we used a highly reproducible *in vivo* infection model mimicking subclinical NE (Gholamiandehkordi et al., 2007). A total of 360 one-day-old Ross 308 broilers were randomly divided into four groups of three replicates with 30 birds per replica. Throughout the entire experiment, groups 1 and 4 received a blank diet while groups 2 and 3 received a diet experimentally contaminated with DON. All birds in group 1 and 2 were challenged orally with *C. perfringens* strain 56 containing approximately 4 x 10^8 cfu/ml for four consecutive days starting at day 17. The remaining groups received sterile medium.
At 1, 2 or 3 days after the final challenge with *C. perfringens*, chickens were euthanized and scored macroscopically for intestinal NE lesions. Chickens that received DON and *C. perfringens* had significantly (alpha=0.05, P<0.001) more lesions than chickens that received only *C. perfringens*, with 46.6% and 19.5% of chickens positive for NE lesions, respectively. In non-inoculated groups no NE lesions were present.

In conclusion, the presence of DON in the feed in concentrations lower than the maximum guidance level of 5000 µg/kg is a predisposing factor for the development of NE in broilers.

References

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