

The mycotoxin deoxynivalenol decreases immunity in poultry

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Introduction

The presence of mycotoxins in poultry feeds is a significant factor for financial losses to animal industries. Deoxynivalenol (DON) is of great importance, because it may occur in toxicologically relevant concentrations in grains, which can affect the health and productivity of farm animals. DON, a *Fusarium* toxin belonging to the trichothecene group, has been reported to produce a variety of adverse health effects in farm animals, such as inhibition of protein synthesis, reduction of feed intake, and alteration of the immune system. Although acute mycotoxicoses are rare in poultry production, chronic exposure to low levels of mycotoxins is responsible for reduced productivity and increased susceptibility to infectious diseases.

Objectives

The present experiments have been performed to explain whether DON modulates the immune function. Therefore, the objectives of our studies are to examine the effects of feeding of DON contaminated diets on performance, immune organs weight, haematological blood parameters and antibody titers against Infectious Bronchitis Virus (IBV) in serum.

Methods

Sixteen 1-d-old broiler chicks were randomly divided into two groups. The control group was fed non-contaminated diet (starter diet containing normal protein, 21%). Another group of broilers was fed a diet artificially contaminated with 10 mg DON/kg diet. Birds were vaccinated at the hatchery with one dose per chick of Mild-Vac-M vaccine by coarse aerosol spray at the first day of life. The permission for this experiment was granted by the Federal Ministry for Education, Science and Culture, Vienna, Austria vide letter No. BMWF-68.205/0032-II/10b/2010. The starter for 2 week and low protein grower diets were provided ad libitum for 3 weeks. On day 35 at the end of experiment, blood was collected from 8 chicks per group during slaughtering, and the serum was separated. The antibody titres for IBV were measured by the anti-IB antibody ELISA kit.

Results

Feeding of contaminated diets significantly decreased ($P < 0.001$) the feed intake, body weight (BW), BW gain and feed efficiency during the grower phase. The feeding of contaminated diets altered the immune response in broilers by reducing the total lymphocyte counts (29.67) compared with control (43.29) at week 5. Similarly, the antibody response against IBV antigens was significantly ($P < 0.05$) decreased after feeding DON contaminated diets compared with controls.

Conclusion

It was concluded that broiler performance and some blood and immunological parameters were adversely affected by feedborne *Fusarium* mycotoxin deoxynivalenol. Our data indicate that DON alters the vaccinal immune response. These results may have implications for human and animals consuming DON-contaminated food or feed as breakdown in vaccinal immunity may lead to the occurrence of disease even in properly vaccinated populations.

Graph title

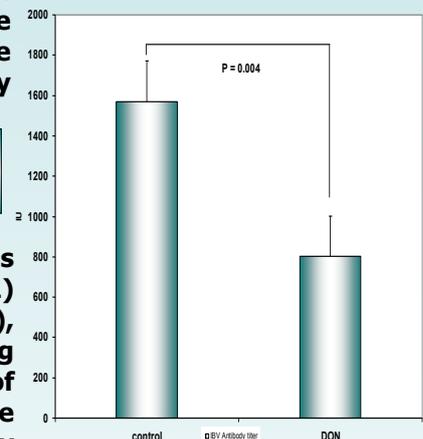


Figure 1. Effect of dietary *Fusarium* mycotoxin deoxynivalenol on infectious bronchitis virus titres in sera of broiler chickens