

Effects of Feed-Borne *Fusarium* Mycotoxins on Hematology and Immunology of Turkeys

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ABSTRACT Feeding grains naturally-contaminated with *Fusarium* mycotoxins has been shown to alter the metabolism and performance of turkeys. The objectives of the current experiment were to examine the effects of feeding turkeys with grains naturally contaminated with *Fusarium* mycotoxins on their hematology and immunological indices (including functions), and the possible protective effect of feeding a polymeric glucomannan mycotoxin adsorbent (GMA). Two hundred twenty-five 1-dold male turkey poults were fed corn, wheat, and soybean meal-based starter (0 to 3 wk), grower (4 to 6 wk), developer (7 to 9 wk), and finisher (10 to 12 wk) diets formulated with uncontaminated grains, contaminated grains, or contaminated grains with 0.2% GMA. The chronic consumption of *Fusarium* mycotoxins caused minor and transient changes in hematocrit (0.33 L/L) and hemoglobin (106 g/L) concentrations as well as in blood basophil ($0.13 \cdot 10^9/L$) and monocyte counts ($3.42 \cdot 10^9/L$) compared with controls. Supplementation of the contaminated diet with GMA prevented these effects on blood cell counts. Biliary IgA concentrations were significantly increased (4.45-fold) when birds were fed contaminated grains compared with controls, but serum IgA concentrations were not affected. Contact hypersensitivity to dinitrochlorobenzene, which is a CD8⁺ T-cell-mediated delayed-type hypersensitivity response, was decreased (48%) by feed-borne mycotoxins compared with the control. By contrast, the primary and secondary antibody response to sheep red blood cells, a CD4⁺ T-cell-mediated response, was not affected. It was concluded that chronic consumption of grains naturally contaminated with *Fusarium* mycotoxins exerts only minor adverse effects on the hematology and some immunological indices of turkeys. Consumption of grains naturally contaminated with *Fusarium* mycotoxins may, however, increase the susceptibility of turkeys to infectious agents against which CD8⁺ T cells play a major role in defense.

(Key words: *Fusarium* mycotoxin, hematology, antibody-mediated immunity, cell-mediated immunity, biliary IgA)

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Abbreviation Key: CHS = contact hypersensitivity; DNCB = dinitrochlorobenzene; DON = deoxynivalenol; GMA = glucomannan mycotoxin adsorbent; Hb = hemoglobin; HRP = horseradish peroxidase; ZEN = zearalenone.