

# The mycotoxin deoxynivalenol increases the stress reaction in poultry

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## Introduction

It has been showed that DON reduce immunity by inhibiting protein synthesis and thus cell proliferation. Some mycotoxins are cytotoxic to lymphocytes in vitro. There is no information available regarding the effect of contamination of broiler diet with deoxynivalenol (DON) on physiological stress response. Physiological manifestations of stress in poultry include changes in the number of circulating leukocytes in particular a pronounced heterophilia and lymphocytopenia which is a reliable indicator of stress. The heterophil: lymphocyte ratio (H/L ratio) was used as an index of stress in chicken (Zulkifli et al., 2000).

## Objectives

The present study was conducted to investigate the effect of contamination of broiler diet with 10 mg deoxynivalenol mycotoxin on physiological manifestations of stress in broilers. In addition the effect of feed additive (Mycofix plus, BIOMIN GmbH Herzogenburg, Austria) addition to broiler diet in the presence and absence of deoxynivalenol mycotoxin contamination on the heterophil to lymphocyte ratio was also investigated.

## Reference

Zulkifli, I., M.T. Che Norma, C.H. Chong and T.C. Loh, 2000a. Heterophil to lymphocyte ratio and tonic immobility reactions to preslaughter handling in broiler chicken treated with ascorbic acid. Poul. Sci., 79: 402-406.

## Methods

The birds was housed in battery cages from 1-d. old and fed with one of the following dietary treatments;1) basal diet, 2) diet contaminated with 10 mg DON/kg feed, 3) diet contaminated with 10 mg DON/kg feed and supplemented with Mycofix plus, 4) diet supplemented with Mycofix plus. At 5 wk old, 7 birds from each group were bled and blood samples were collected and sent to the central laboratory of the veterinary university of Vienna for analysis. The total leucocytic count and one hundred leukocytes including granular (heterophils, oesinophils and basophils) and non granular (lymphocytes and monocytes) were counted on one slide for each bird and the heterophil to lymphocyte ratio (H/L ratio) was calculated.

## Results

Contamination of broiler diet with 10 mg of DON resulted in an increase ( $P < 0.05$ ) in the heterophils (H) counts compared with controls. However, addition of Mycofix to diet in the presence of DON counteracts the effect of DON on H counts. In contrast to this, Lymphocyte (L) counts were decreased ( $P < 0.05$ ) due to contamination of diet with DON. Moreover, the heterophil to lymphocyte ratio (H/L ratio) was increased ( $P < 0.05$ ) for birds fed diet contaminated with DON ( $2.37 \pm 0.51$ ) compared with controls ( $1.07 \pm 0.15$ ). Interestingly, Mycofix supplementation to diet contaminated with DON decrease ( $P < 0.05$ ) the H/L ratio ( $1.64 \pm 0.13$ ) compared with DON group ( $2.37 \pm 0.51$ ).

## Conclusion

The results indicate that DON at a dietary level 10 mg /kg diets has a wide range of effects. It causes decreased growth and feed intake and decreased cellular immunity (H/L ratio). All these effects mean that birds consuming DON are highly susceptible to disease agents and stress. However, addition of Mycofix to diet contaminated with DON might counteract some of the toxic effects produced by DON.

## Graph title

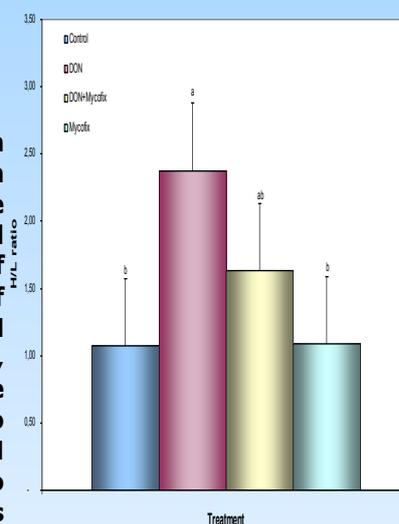


Figure 1. Effect of dietary *Fusarium* mycotoxin DON on physiological stress response in chickens