

EVALUATION OF HEPATIC GLUTATHIONE-S-TRANSFERASE GENE EXPRESSION RELATED TO T-2 TOXIN AND DEOXYNIVALENOL IN CHICKEN

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The objective of this study was to determine the effects of dietary T-2 toxin and deoxynivalenol (DON) on hepatic gene expression and activity of glutathione-S-transferase (GST) in one-week old male broiler chicken during a 72 h period after exposition. A total of 165 male chickens were assigned to one of the three dietary treatments (control, T-2 toxin and DON) in 2 replicates. The diets experimentally contaminated with 5.77 mg of T-2 toxin and 4.86 mg of DON/kg of feed. Liver samples were taken after 0, 2, 4, 8, 12, 16, 20, 24, 36, 48, 60 and 72 hours after toxin exposition of 5 randomly chosen chicken in each group. RNA was purified from DNA contamination, reverse transcribed, and were measured by quantitative real-time PCR with SYBRGreen technology. Compared with controls GST gene expression, which is associated with the antioxidant protection against reactive oxygen species to prevent lipid peroxidation, was down-regulated in birds as effect of T-2 toxin or DON contaminated feed intake in several times during the trial. T-2 toxin and DON exposure also resulted in varied enzyme activity related to altered gene expression of GST. In addition marked daily fluctuation of the gene expression was observed in the control but not in the mycotoxin treated groups. The significant up-regulation was measured during the morning period. This daily fluctuation may be related to the regular feed intake, which usually happens in the early morning period, thus the necessary nutrients would be absorbed and utilized for the protein synthesis during the translation in the forthcoming period. This study demonstrate that T-2 toxin and DON exposure at the concentrations were used resulted the down-regulation of GST gene expression and in physiological responses associated with altered gene expression in the enzyme activity of GST in chicken livers as a short-term effect. It is also important to note the daily fluctuation as physiological changes in the animals during the day in association with other physiological functions. This study was supported by the János Bolyai Research Scholarship (BO/261/13) of the Hungarian Academy of Sciences and by the OTKA (PD-104823).