The effects of dietary deoxynivalenol (DON) on selected blood biochemical and hematological parameters in pre-pubertal gilts

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Abstract

The aim of this study was to determine whether exposure to low doses of DON leads to changes in serum hematological and biochemical profiles. In the experiment, pre-pubertal gilts (with body weight of up to 25 kg) were administered DON per os at a daily dose of 12 μg/kg BW (group E, n=18) or a placebo (group C, n=21) over a period of 42 days. Blood for analysis was sampled seven times at weekly intervals. Minor, but statistically significant changes were observed in selected indicators, particularly in weeks 2 and 3 in values of biochemical parameters such as ALT, AST, P₅₀, and Fe, and in values of hematological parameters such as RBC, MCV, MCHC, PLT, MPV, WBC, neutrophil, eosinophil, lymphocyte, and monocyte counts. In group E, a decreasing trend of the values was observed in most cases, except for RBC, PLT, eosinophil, lymphocyte, and monocyte counts. Similar results were obtained in the last two weeks of the experiment. Initially, exposure to DON has a stimulating effect, which is eliminated when adaptive mechanisms are triggered. The results of the study indicate that the intensity of biotransformation processes varies subjected to the body’s energy resources.

Key words: deoxynivalenol, low doses, blood biochemistry, hematology, pre-pubertal gilts

Introduction

The results of hematology and blood biochemistry tests in veterinary laboratories contribute to the effectiveness of medical treatment (Panteghini and Forest 2005). Preventive and clinical measures cannot be initiated when the required medical data are absent or insufficient. The above also applies to diagnoses of pathological conditions caused by exposure to mycotoxins, including deoxynivalenol (DON).

DON is one of the most extensively researched Fusarium mycotoxins that is commonly found in plant material. DON is also widely investigated because it poses a significant health risk for humans and animals (De Angelis et al. 2014). To counteract that risk, maximum levels for DON have been established in...