Cecal enzyme activity in gilts following experimentally induced *Fusarium* mycotoxicosis

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Abstract

The objective of the presented study was to examine the influence of *Fusarium* mycotoxins (zearalenone – ZEN and deoxynivalenol – DON), administered separately and in combination, on the activity of cecal enzymes (β-glucosidase and β-glucuronidase) in gilts which were fed fodder contaminated with these mycotoxins. The activity of β-glucosidase and β-glucuronidase varied in the range of 0.170-1.236 μmol · h⁻¹ · mg⁻¹ and 8.701-96.704 μmol · h⁻¹ · mg⁻¹, respectively. In the first two weeks, the toxins had no significant effect on the activity of β-glucosidase and β-glucuronidase in the ascending and descending colon. After week 3 and later on, ZEN and DON administered as a mixture led to the highest increase in the activity of both enzymes. Administered separately, DON affected the activity of enzymes more than ZEN. From the third week of the experiment, an increase in the activity of CW β-glucosidase and β-glucuronidase was observed.

Key words: zearalenone, deoxynivalenol, gilts, β-glucosidase, β-glucuronidase

Introduction

Mycotoxins are toxic products generated by naturally occurring metabolic processes in fungi, which fungi can contaminate various feed components, such as maize, wheat, barley, millet, peanuts, peas, and oily feedstuffs (Antonissen et al. 2014). No geographic region is free from the occurrence of mycotoxins. According to Lawlor and Lynch (2005), 25% of global crops are contaminated with mycotoxins. Out of the 7049 maize, soybean meal, wheat, and finished feed samples analyzed in the years 2009-2011 for the presence of aflatoxin, zearalenone, deoxynivalenol, fumonisins, and ochratoxins in the Americas, Europe, and Asia, 81% were positive for at least one mycotoxin; aflatoxins were present in 33%, deoxynivalenol in 59%, and fumonisins in 64% (Rodrigues and Naehrer 2012). A report by the Food and Agriculture Organization of the United Nations (FAO 2004) on mycotoxin regulations around the world revealed that at least 77 countries have now specific rules concerning acceptable concentrations of mycotoxins in foods and feeds. Regardless of the geographical area (temperate, subtropical, or tropical zone), a filamentous fungus infection of grain is likely if humidity is high at the time of harvest.

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