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IMPACT OF FUMONISINS AND A FUMONISIN-DEGRADING FEED ADDITIVE (FUMZYME®) ON PERFORMANCE AND BIOMARKERS OF EFFECT AND EXPOSURE IN SWINE

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Introduction

Fumonisin (FUM) are a group of mycotoxins often found in *Fusarium* contaminated maize. As swine is the species most sensitive to FUM, these mycotoxins represent a serious threat to swine production. FUM can cause immune-modulation and organ specific alterations depending on dose and duration of exposure. FUM disrupt the sphingolipid metabolism by blocking ceramide synthase leading to accumulation of free sphinganine (Sa). Consequently, the production of complex sphingolipids, necessary components of nerves, muscles and membranes, is interrupted. In the present study, the efficacy of a feed additive containing a fumonisin esterase (FumD; commercial name FUMzyme®) for detoxification of FUM was investigated, using the sphinganine to sphingosine ratio (Sa/So) in serum as biomarker of effect.

Material & Methods

We performed two trials with identical setup. For each trial, pigs (n=32) were allocated to 8 experimental groups and individually penned during the whole trial period of 42 days. Groups of pigs (n=4) received feed naturally contaminated with fumonisin B1 (FB1) at different concentrations (0.5 - 31 mg/kg) either with or without FumD (10 U/kg). Feces samples were taken at day 14, 28 and 42 to evaluate the enzymatic degradation of FB1 to hydrolyzed FB1 (HFB1). HFB1 shows a reduced toxicity compared to FB1.

Results

In the course of the study a negative impact of FB1 on weight, weight gain and FCR of the animals was observed. For all dietary FB1 concentrations tested, the Sa/So ratio in serum was significantly lower in the groups fed FumD-containing diets. It was almost reduced to control level. Furthermore, for most tested dietary FB1 concentrations, the enzyme caused a significant decrease of the fecal FB1 concentration and a concomitant significant increase of the fecal HFB1 concentration.

Conclusion

We conclude that FUMzyme® is effective in preventing a toxic effect of fumonisins in pigs.

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