

Influence of dietary fumonisin B1 on nutrient utilization by growing pigs

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Chronic ingestion of dietary FB1 of >5.0mg kg⁻¹ generally reduced nutrient utilization in growing Large White pigs

Abstract

Twenty-four male Large White weanling pigs of 8-9 weeks of age averaging 6.94 ± 0.26 kg were used to evaluate the effect of dietary fumonisin B1 (FB1) on nutrient digestibility by growing pigs. The animals were randomly assigned in a Completely Randomized Design to 4 diets containing 0.2, 5.0, 10.0 and 15.0mg FB1/kg constituting the control, diets 1, 2 and 3 respectively, in a 6-month feeding trial. The feeding trial was divided into 3 physiological phases [weanling (starter), peri-pubertal (grower) and pubertal (finisher)]. The proximate chemical compositions of the experimental diets as well as the faecal samples collected from animals in each treatment during the last seven days of each physiological phase were determined using standard methods to calculate the apparent digestibility of dry matter (DM), organic matter (OM), crude protein (CP), ether extract (EE), crude fibre (CF), ash and nitrogen-free extract (NFE).

There was a significant influence of the dietary FB1 levels on the apparent digestibility of the ether extract (EE) during the weanling phase. Animals on the control diet had significantly ($P < 0.05$) higher apparent digestibility of EE than those on diets 1, 2 and 3 containing higher levels of dietary FB1. The digestibility of the EE and crude protein (CP) were significantly ($P < 0.05$) lower with increased dietary FB1 during the peri-pubertal phase. However, the apparent digestibility values observed during the pubertal phase for animals on the control diet were generally (except for ash) higher than those on diets 1, 2 and 3 for each parameter. The significantly ($P < 0.05$) lower values of 55.70, 57.71 and 51.27% for the apparent NFE digestibility of the animals on diets 1, 2 and 3 were only about 83.36, 86.37 and 76.73% of those on the control diet respectively.

The significantly lower nutrient digestibility by animals on diets 1, 2 and 3 suggest adverse effect of FB1 on intestinal function in nutrient digestibility and absorption of the nutrients in animals. The study revealed that chronic ingestion of dietary FB1 of >5.0mg kg⁻¹ generally reduced nutrient utilization in growing Large White pigs.

Key words:

Dietary fumonisin B1, nutrient digestibility, pigs

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