

Comparative Effects of Sodium Gluconate, Mannan Oligosaccharide and Potassium Diformate on Growth Performances and Small Intestinal Morphology of Nursery Pigs

Abstract

This study was conducted to compare the effects of dietary supplementation of Sodium Gluconate (SG), Mannan Oligosaccharide (MOS) and Potassium Diformate (PDF) on growth performance and small intestinal morphology in nursery piglets. One hundred forty four female piglets (11.69

□0.71 kg) were

treatments with six replicates of six pigs each. The pigs received a control diet or diets supplemented with SG, MOS and PDF at 2,500, 3,000 and 8,000 ppm; respectively, for 6 weeks. Supplementation of SG, MOS or PDF increased final body weight, average daily gain and tended to improve feed to gain ratio ($p = 0.02$, 0.04 and 0.16 ; respectively), other than average daily feed intake, intestinal pH and the bacterial populations were not influenced by the dietary treatments. SG significantly decreased the ammonia concentration in the caecum ($p < 0.05$) and supplementation of SG, MOS or PDF tended to increase lactic acid and total short chain fatty acid concentration in the caecum ($p = 0.08$, 0.09 ; respectively), in addition SG, MOS or PDF slightly increased butyric acid concentration in the caecum ($p = 0.14$). SG highly significant increased the villous height in jejunum ($p < 0.01$) and supplementing SG, MOS or PDF significantly increased crypt depth in jejunum ($p < 0.05$), moreover, PDF significantly increased villous height and crypt depth ratio in jejunum ($p < 0.05$) compared with control. The dietary treatments did not influence villous height and crypt depth in duodenum and villous height in jejunum ($p > 0.05$). It can be concluded that supplementing SG, MOS or PDF as a feed additive has the potential to improve the growth performance, the intestinal lactic acid bacteria population, intestinal short-chain fatty acid concentration and the intestinal morphology of pigs.

Keywords: Sodium Gluconate; Mannan Oligosaccharide; Potassium Diformate; Growth Performance; Intestinal Morphology; Pigs

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Potassium Diformate, Sodium Diacetate, Calcium Formate