Theerawit Poeikhampha 2011: Effects of Sodium Gluconate on Production Performances, Intestinal Tract, Intestinal Microorganism and Immunity of Nursery Pigs. Doctor of Philosophy (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Chaiyapoom Bunchasak, Ph.D. 86 pages.

The study was divided into 3 experiments. Experiment 1, study effects of sodium gluconate in batch culture of nursery pig caecal digesta. The treatments were 0 (control group), 1,250, 2,500, 5,000 and 7,500 ppm of sodium gluconate supplementations (*in vitro*). Fermentation of sodium gluconate at 24 h decreased pH ($P<0.01$) and ammonia ($P<0.05$), while increased concentration of acetic acid, propionic acid and total short chain fatty acids in batch culture of pig caecal digesta ($P<0.01$). Experiment 2, study effects of supplementing sodium gluconate in diet of nursery pig. Pigs received diet supplemented sodium gluconate at 1,000, 2,500, 5,000 ppm and without sodium gluconate (control group). The results indicated that sodium gluconate significantly improved body weight and feed to gain ratio ($P<0.05$), increased propionic acid and total short chain fatty acids ($P<0.01$), while tended to decrease *Escherichia coli* in the caecum of pigs ($P=0.09$). Additionally, supplementation of sodium gluconate at 2,500 or 5,000 ppm increased villi height in duodenum ($P<0.01$). Feed intake and immunity of pigs were not significantly influenced by sodium gluconate supplementation. Finally, experiment 3 was conducted to compare the effects of supplementing sodium gluconate (5,000 ppm), mannan oligosaccharide (3,000 ppm) and potassium diformate (8,000 ppm) in diet of nursery pig. Supplementing these feed additives increased body weight ($P<0.05$), propionic acid and total short chain fatty acids ($P<0.01$) in the caecum of pigs, while there was no significant effect on feed intake and feed conversion ratio. In conclusion, sodium gluconate clearly improved growth performance, increased intestinal short chain fatty acids, and efficiency of supplementing sodium gluconate at 5,000 ppm on growth performance similar to those of supplementing mannan oligosaccharide and potassium diformate.

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