

Chanwit Kaewtapee 2008: Effects of Liquid DL-Methionine Hydroxy Analog Free Acid on Production Performance, Intestinal Ecology and Intestinal Morphology of Nursery Pigs. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Chaiyapoom Bunchasak, Ph.D. 114 pages.

Two experiments were designed to study effects of liquid DL-methionine hydroxy analog free acid (LMA) on production performance, intestinal ecology and intestinal morphology of nursery pigs. A completely randomized design was used. The first experiment was conducted to evaluate effect of LMA in diets on production performance, microbial in gastrointestinal tract, concentration of short chain fatty acids (SCFAs) in caecum and small intestinal morphology. One hundred and eighty crossbred (Large White x Landrace, BW ~ 12.48 kg) barrow were divided into three groups with ten replications of six piglets each for 6 weeks. Piglets received LMA in diet at 0.00 (control), 0.15 or 0.24%. The results indicated that supplementation of LMA was not affected of average daily feed intake (ADFI; P=0.56), average daily gain (ADG; P=0.22) and feed conversion ratio (FCR; P=0.22). Nevertheless, adding 0.15% LMA significantly improved weight gain (P=0.03). Supplementation of LMA significantly increased average LMA and methionine daily intake (P<0.01), and significantly reduced pH of diet (P<0.01) and *E. coli* in diet (P=0.02) and pH of caecum and colon (P<0.01). Consequently, acetic acid was significantly increased when LMA was added (P=0.04) and adding 0.15% LMA significantly increased valeric acid (P=0.02) and increased villous height of jejunum (P<0.01). Adding 0.24% LMA decreased crypt depth of ileum (P<0.01) resulting increased villous height to crypt depth ratio of ileum (P<0.01). Second experiment was investigated to evaluate the effect of LMA in drinking water on production performance, microbial in drinking water and gastrointestinal tract, concentration of SCFAs in caecum and small intestinal morphology. Twenty-four crossbred pigs (Large White x Landrace, BW ~ 18.92 kg) were divided into three groups with four replications of two piglets each for 6 weeks. The piglets received drinking water of 0.00 (control), with 0.05 or 0.10% LMA. The results indicated that adding LMA at 0.10% to drinking water significantly increased ADFI (P<0.01) and ADG (P=0.02), although FCR was not significantly affected (P=0.20). Adding LMA to drinking water significantly increased their water intake and significantly reduced the pH of drinking water (P<0.01), consequently total plate count (P=0.04) and *E. coli* in drinking water was reduced (P<0.01). Furthermore, adding LMA at 0.10% significantly increased villous height in the duodenum (P=0.02), jejunum (P=0.04) and ileum (P=0.01), and the villous height to crypt depth ratio in the jejunum (P=0.04), whereas acetic acid concentration in the caecum was significantly lower than in the control group (P<0.01). It could be concluded that supplementation of LMA increased production performance of nursery pigs due to increment of source of methionine and water quality along with high nutrient utilization caused by an improvement of small intestinal morphology.

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Thesis Advisor's signature