


Somrapee Phumiphakdeephan 2008: Effect of Sodium Gluconate Supplementation as Prebiotic on Growth Performance, Digestive Physiology and Immunity in Broilers. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Chaiyapoom Bunchasak, Ph.D. 91 pages.

This study was conducted to determine the effect of sodium gluconate (SG) supplementation as prebiotic on growth performance, digestive physiology and immunity in broilers. The study was divided into two trials using a completely randomized design. First experiment was carried out to investigate the effects of SG on growth performance and physiological function of digestive system during starter period. Eight hundred and thirty two chicks were separated into 2 groups (raised in floor pens) consisted with 26 replications (16 chicks per replicate) and experimental diets were given as following; 1. diet without SG supplementation (control group) and 2. diet supplemented with 0.2% SG. There were not effects of adding SG on growth performance. Ileum, spleen and bursa gland weight were significantly increased by SG supplementation, while abdominal fat was decreased ($P<0.05$). In addition, the ratio of villi/crypt of liberkühn length of duodenum ($P<0.01$) and jejunum ($P<0.05$) parts were significantly increased by SG supplementation.

In the second experiment, the effects of SG supplementation as prebiotic on growth performance, carcass, digestive physiology and immunity in broiler during grower period. Chicks were separated into 4 groups consisted with 16 replications and experimental diets were given as follow; 1. diet without SG supplementation (control group) 2. diet supplemented with SG in starter (0.2%) and grower periods (0.1%) 3. diet supplemented with SG (0.2%) in starter periods and 4. diet supplemented with SG (0.1%) in grower period. The results indicated that supplemented SG in both starter and grower period decreased feed consumption ($P<0.01$), but did not effect to growth performance. The percentage of carcass, outer and inner breast meat, and eatable meat were significantly increased, while abdominal fat weight was decreased when supplemented SG to diet in both starter and grower period ($P<0.01$). In this group, furthermore the length of duodenum and colon, the ratio of villi/crypt of liberkühn length of duodenum ($P<0.05$) and jejunum ($P<0.01$) parts were significantly increased ($P<0.01$) and the villi wide of duodenum and jejunum parts were also improved. Ceaca short chain fatty acid (acetic acid, butyric acid and total acids) were elevated when the chickens received SG supplementing diet in both of starter and grower periods ($P < 0.01$). Spleen weight, ND-Titer and gamma globulin were ameliorated, while H:L and beta globulin was declined ($P<0.01$).

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