

Pichaya Sae-ung 2010: Effects of Adding Formic Acid in Drinking Water on Performance, Immunity, Microbial Ecology in Digestive Tract and Minerals Retention of Broiler. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Chaiyapoom Bunchasak, Ph.D. 125 pages.

Two experiments were designed to study effects of adding formic acid in drinking water on performance, immunity, microbial ecology in digestive tract and minerals retention of broilers. First experiment was conducted to determine the minimum inhibitory concentration (MIC) and minimum bacteriocidal concentration (MBC) of formic acid to against *Escherichia coli*, *Salmonella typhimurium*, *Salmonella enteritis* and *Staphylococcus aureus*. The result showed that MIC and MBC of formic acid against to *Escherichia coli* and *Salmonella typhimurium* were 0.10 and 0.15%, respectively. While MIC and MBC of formic acid against to *Salmonella enteritis* and *Staphylococcus aureus* were 0.15 and 0.20%, respectively. Second one was investigated the effects of adding formic acid in drinking water on performance, immunity, intestinal ecology and minerals retention of broiler. Six hundreds of day old male ROSS 308 chicks were divided into 4 groups of 6 replications with 25 chickens/each. Total of 4 treatment groups of drinking water were performed; 1) control (without formic acid supplementation), 2) formic acid 0.01%, 3) formic acid 0.05% and 4) formic acid 0.10%. The result indicated the adding formic acid into drinking water decreased pH of the drinking water. Adding formic acid 0.01 and 0.05% did not effect to production performance when compared to control group ($P>0.05$). Conversely, adding formic acid 0.10% in drinking water significantly depressed production performance ($P<0.01$). Moreover, breast (g) was significantly decreased by adding 0.10 % formic acid ($P=0.04$). *E. coli* counts in the drinking water significantly decreased by increasing formic acid ($P<0.01$). In the present study, adding formic acid to drinking water at 0.10% significantly reduced the pH in crop ($P=0.02$). Although, adding formic acid in drinking water did not affect short chain fatty acids concentration in the caecum, but villous height in the jejunum was significantly increased when added 0.01% formic acid ($P=0.03$). Conversely, adding formic acid at 0.10% significantly decreased villous height in duodenum ($P<0.01$) and increased heterophil/lymphocyte ratio ($P<0.05$). Moreover, IgG concentration, mineral retention in bone and walking ability were slightly decreased. This study indicate that adding formic acid in drinking water at 0.01 and 0.05% had no effect on production performance. Conversely, adding formic acid at 0.10% depressed production performance.

Student's signature

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