**Hydrogen peroxide in drinking water improves growth performance and amino acid digestibility in broiler chickens during early grow-out period.**


## Abstract

The effects of hydrogen peroxide ($H_2O_2$) on broiler performance at varying water concentrations have not been thoroughly studied. This study was conducted to investigate the effects of various concentrations of a peroxide-based product (3% hydrogen peroxide) in drinking water on early broiler growth performance and amino acid (AA) digestibility. In brief, a total of 100 Cobb-500 male birds were reared on a standard experimental diet from day(d) (0-13). The birds were divided into five treatment groups with 5 replications (4 birds/replication). Four stock solutions were created at ratios of $H_2O_2$ to water for T1 (2:32), T2 (4:32), T3 (8:32), and T4 (16:32); and 1 mL of each stock solution was mixed with 100 mL of drinking water, while the control group was supplied with normal tap water. Birds were weighed on d 0, d 7, and d 13, and their water intake was recorded. Data were analyzed using one-way ANOVA with Tukey multiple range test for group differences ($P \leq 0.05$). $H_2O_2$ supplementation in T2 and T4 groups showed higher body weight (BW) at d 6 and d 13 compared to the CON group. Hydrogen peroxide supplementation in T2 showed higher body weight gain (BWG) ($P<0.001$) and lower feed conversion ratio (FCR) ($P<0.001$) in phase 1 compared to the CON. In phase 2, T2 and T4 groups showed lower feed intake (FI) ($P<0.001$) and lower FCR ($P=0.002$) compared to CON group. In the overall period, T2 and T4 groups showed higher BWG ($P=0.007$), lower FI ($P<0.001$) and lower FCR ($P<0.001$) compared to the CON group. Water intake (WI) in 13 days period was higher in T1, T3 and T4 groups compared to the CON group. Apparent ileal digestibility (AID) of total amino acid (AA), isoleucine, leucine, lysine, phenylalanine, threonine, tryptophan, valine, alanine, aspartic acid, cysteine, glutamic acid, glycine, proline, and tyrosine were higher in T3 group compared to CON. The study demonstrated that tested levels of $H_2O_2$ did not harm growth performance of broilers where T2 and T4 bird groups exhibited better growth performance with highest AID of AA in T3 group.


Key words: poultry drinking water sanitizer, hydrogen peroxide ($H_2O_2$), growth performance, amino acid digestibility, apparent ileal digestibility