

Effect of xylanase and cellulase supplementation on growth performance, volatile fatty acids and caecal bacteria of broiler chickens fed with palm kernel meal-based diet

ABSTRACT

In this study, the effect of xylanase and cellulase supplementation in palm kernel meal (PKM) based diet on growth performance, volatile fatty acids (VFAs) and the caecal bacterial populations of broiler chickens were investigated. Seventy five day old male Cobb broiler chicks were randomly allocated to three dietary treatment groups receiving T1 (20% PKM-based diet without enzyme), T2 (20% PKM-based diet with xylanase) and T3 (20% PKM-based diet with cellulase). Each enzyme was supplemented at an amount of 200U/kg of feed. Weekly body weight gain and feed intake were recorded. All chickens were slaughtered on day 35 and the caecum content was aseptically collected for VFAs quantification and bacterial enumeration. Supplementation of xylanase and cellulase in PKM diets had different effect on the growth performance, the number of caecal bacterial population and VFAs produced. A significant reduction in the cumulative feed intake of birds fed cellulase-supplemented PKM compared to xylanase-supplemented and unsupplemented PKM diet was observed. However, the final body weights gain and cumulative feed conversion ratio (FCR) were not significantly different between the treatment groups. Determination of VFAs production of the caecal contents demonstrated a significant difference in the production of iso-butyric and n-valeric acid among treatment groups. The number of total viable bacteria, lactic acid bacteria (LAB) and coliform in caecal samples were also enumerated. Significant difference was observed in the number of caecal bacteria population between the treatment groups. The effect of xylanase and cellulase on weight gain of broiler chickens was strongly related to the feed intake rather than due to the decrease in the number of pathogenic bacteria in the caeca. Xylanase supplementation was beneficial in enhancing cumulative feed intake, weight gain and FCR of the broiler chickens, but did not entirely reduce the number of pathogenic caecal bacteria. However, cellulase supplementation reduced all parameters observed for growth performance and the number of caecal bacteria.

Keyword: Xylanase; Cellulase; Palm kernel meal; Bacteria; Broiler