Effect of solid state fermentation on nutrient content and ileal amino acids digestibility of palm kernel cake in broiler chickens

ABSTRACT

Digestibility trial was conducted to determine the apparent ileal digestibility (AID) of crude protein (CP) andamino acids (AA) in untreated palm kernel cake (PKC) and fermented palm kernel cake (FPKC) on finisher broiler. Paenibacillus polymyxa ATCC 842 and P. curdlanolyticus DSMZ 10248 were used to produce FPKCa and FPKCb, respectively through solid state fermentation (SSF). Broiler male chickens were fed with diets containing 15%PKC from day one until 41 days of age. Birds (36) were selected with uniform body weight, and randomly distributed into 3 groups with 6 replicates in each treatment and 2 birds per replicate. The chickens were deprived from food overnight with free access to drinking water. The birds were fed PKC, FPKCa and FPKCb with indigestible marker. All the chickens were allowed free access to the test ingredients and drinking water for 4 days. The birds were slaughtered; ileal digesta were individually collected, pooled within each replicate in plastic cups; and immediately kept at –20°C for chemical analysis. The findings showed that the process of SSF by cellulolytic bacteria increased the levels of CP from 16.43% in the PKC to 16.68% and 16.80% in FPKCb and FPKCa, respectively. The AID of CP was increased in FPKC compared to the PKC. Additionally, there was an increase in the digestibilities of AA in FPKC compared to untreated PKC. The process of SSF decreased the fibres in FPKC, and there was improvement in the nutrient value of FPKC by cellulolytic bacterial cultures in terms of nutrient content and digestibility.

Keyword: Amino acids; Broiler; Cellulolytic bacteria; Digestibility; Fermented palm kernel cake