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Nutrient digestibility and blood profile of broiler chickens fed fermented sweet orange peel-based diets

ESTHER TAIWO¹, OLUWABIYI OLUREMI², KENAN ORAYAGA³

¹*Swedish University of Agricultural Sciences, Dept. of Animal Breeding and Genetics, Germany*

²*The National University of Lesotho, Roma, Lesotho, Dept. of Animal Science, Lesotho*

³*Federal University of Agriculture, Dept. of Animal Nutrition, Nigeria*

Abstract

The research aimed to determine the nutrient digestibility and blood profile of broiler chickens fed biodegraded sweet orange peel-based diets in Nigeria. The sweet orange peels were obtained from retail sellers while fresh rumen content was procured from a government abattoir. Rumen content was mixed with water in the ratio of 1 kg:1 litre, and the resultant mixture was sieved to obtain rumen filtrate (RF). The rumen content was mixed with sweet orange peels at the ratio of 1 litre:2.5 kg respectively. The mixture was then fermented for 48 hours, sun-dried, milled, and incorporated into the broiler diets at starter and finisher phases as a replacement for maize at levels of 0% (T1), 5% (T2), 10% (T3), 15% (T4) and 20% (T5). The experiment involved a fifty-six-day feeding trial, where a hundred and fifty-day-old chickens were randomly assigned to five dietary treatments, and each was replicated three times in a completely randomised design. The results showed that the coefficient of digestibility of dry matter, crude protein, crude fibre, ether extract and nitrogen-free-extract did not differ significantly ($p > 0.05$) among the treatment groups, while, as retention differed significantly ($p < 0.05$) across the treatment groups haematological indices; haemoglobin, red blood cell (RBC), packed cell volume, mean corpuscular volume (MCV) and mean corpuscular haemoglobin (MCH), did not differ significantly ($p > 0.05$) across the dietary groups, white blood cell (WBC) and mean corpuscular haemoglobin concentration (MCHC) varied significantly ($p < 0.05$), serum indices; total protein (TP), globulin, glucose, cholesterol, and alkaline phosphatase, were significantly affected ($p < 0.05$) by the experimental diets, while albumin, aspartate transaminase, and alanine transaminase did not differ significantly ($p < 0.05$) across the dietary groups. Sweet orange peel-based diets can replace maize up to 20% without affecting nutrient digestibility or having any deleterious effect on the blood parameters of broiler chickens.

Keywords: Blood profile, broiler chickens, fermentation, nutrient digestibility, rumen filtrate