

## Rumen Metabolites and Microbial Load in Fattening Yankasa Rams Fed Urea and Lime Treated Groundnut (*Arachis Hypogaea*) Shell in a Complete Diet

**Authors :** Bello Muhammad Dogon Kade

**Abstract :** The study was conducted to determine the effect of a treated groundnut (*Arachis hypogaea*) shell in a complete diet on blood metabolites and microbial load in fattening Yankasa rams. The study was conducted at the Teaching and Research Farm (Small Ruminants Unit of Animal Science Department, Faculty of Agriculture, Ahmadu Bello University, Zaria. Each kilogram of groundnut shell was treated with 5% urea and 5% lime for treatments 2 (UTGNS) and 3 (LTGNS), respectively. For treatment 4 (ULTGNS), 1 kg of groundnut shell was treated with 2.5% urea and 2.5% lime, but the shell in treatment 1 was not treated (UNTGNS). Sixteen Yankasa rams were used and randomly assigned to the four treatment diets with four animals per treatment in a completely randomized design (CRD). The diet was formulated to have 14% crude protein (CP) content. Rumen fluid was collected from each ram at the end of the experiment at 0 and 4 hours post-feeding. The samples were then put in a 30 ml bottle and acidified with 5 drops of concentrated sulphuric (0.1N H<sub>2</sub>SO<sub>4</sub>) acid to trap ammonia. The results of the blood metabolites showed that the mean values of NH<sub>3</sub>-N differed significantly (P<0.05) among the treatment groups, with rams in the ULTGNS diet having the highest significant value (31.96 mg/L). TVFs were significantly (P<0.05) higher in rams fed UNTGNS diet and higher in total nitrogen; the effect of sampling periods revealed that NH<sub>3</sub>N, TVFs and TP were significantly (P<0.05) higher in rumen fluid collected 4hrs post feeding among the rams across the treatment groups, but rumen fluid pH was significantly (p<0.05) higher in 0-hour post-feeding in all the rams in the treatment diets. In the treatment and sampling period's interaction effects, animals on the ULTGNS diet had the highest mean values of NH<sub>3</sub>N in both 0 and 4 hours post-feeding and were significantly (P<0.5) higher compared to rams on the other treatment diets. Rams on the UTGNS diet had the highest bacteria load of 4.96X10<sup>5</sup>/ml, which was significantly (P<0.05) higher than a microbial load of animals fed UNTGNS, LTGNS and ULTGNS diets. However, protozoa counts were significantly (P<0.05) higher in rams fed the UTGNS diet than those followed by the ULTGNS diet. The results showed that there was no significant difference (P>0.05) in the bacteria count of the animals at both 0 and 4 hours post-feeding. But rumen fungi and protozoa load at 0 hours were significantly (P<0.05) higher than at 4 hours post-feeding. The use of untreated ground groundnut shells in the diet of fattening Yankasa ram is therefore recommended.

**Keywords :** blood metabolites, microbial load, volatile fatty acid, ammonia, total protein

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