

## Effect of Ginger Diets on in vitro Fermentation Characteristics, Enteric Methane Production and Performance of West African Dwarf Sheep

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**Abstract :** Efforts have been made to reduce ruminants' methane emissions while improving animal productivity. Hence, an experiment was conducted to investigate the in vitro fermentation pattern, methane production, and performance of West African dwarf (WAD) rams-fed diets at graded levels of ginger. Sixteen (16) rams were randomly allocated into four dietary treatments with four animals per treatment in a completely randomized design for 84 days. Ginger powder was added at 0.00%, 0.25%, 0.50% and 0.75% as T1, T2, T3 and T4 respectively. The results indicated that at the 24-hour diet incubation, gas production, methane, metabolizable energy (ME), organic matter digestibility (OMD), and short-chain fatty acids (SCFA) concentrations decreased with the increasing level of ginger. Conversely, the sheep-fed T4 recorded the highest daily weight gain (47.61g/day), while the least daily weight gain (17.86g/day) was recorded in ram-fed T1. The daily weight gain of the rams fed T3 and T4 was similar but significantly different from the daily weight gain in T1 (17.86g/day) and T2 (29.76g/day). Daily feed intake was not significantly different across the treatments. T4 recorded the best response regarding feed conversion ratio (18.59) compared with other treatments. Based on the results obtained, rams fed T4 perform best in terms of growth and methane production. It is therefore concluded that the addition of ginger powder into the diet of sheep up to 0.75% enhances the growth rate of WAD sheep and reduces enteric methane production to create a smart nutrition system in ruminant animal production.

**Keywords :** enteric methane, growth, in vitro, sheep, nutrition system

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