

# **Impact of diets containing graded level of malted sorghum sprout mixed with pineapple waste on rumen fermentation profile of West African dwarf goats using In Vitro gas production technique**

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## **Abstract**

An experiment was conducted to determine the impact of diets containing graded levels of malted sorghum sprout mixed with pineapple waste (MSPW) on rumen fermentation profile of West African dwarf goats using in vitro gas production techniques. The malted sorghum sprout and pineapple waste mixture were obtained at ratio 1:2 (weight/weight) respectively and incorporated in graded levels to produce four treatment diets; T1 (0% MSPW), T2 (20% MSPW), T3 (40% MSPW) and T4 (60% MSPW). Each diet sample (200mg) was incubated in buffered rumen liquor for 48 h and in vitro gas parameters were determined using in vitro gas production technique. Gas production was measured at 3, 6, 9, 12, 15, 18, 21 and 24 h post incubation to estimate total gas volume, methane (CH<sub>4</sub>), metabolisable energy (ME; MJ/Kg DM), organic matter digestibility (OMD; %) and short chain fatty acids (SCFA;  $\mu\text{mol}/200 \text{ mg DM}$ ) were estimated using 4mL of 10M NaOH. Results showed range of values for the compounded feed in which dry matter (87.27–92.00 %), crude protein (2.59-7.47 %), ether extract (13.20-18.44 %), ash (10.07-10.68 %), nitrogen free extract (36.42-44.14 %), neutral detergent fibre (46.75-71.85 %), acid detergent fibre (24.25-45.50 %) and acid detergent lignin (9.20-12.25 %). There was significant ( $P<0.05$ ) difference in all the parameters observed across the dietary treatments. Gas volume varied significantly ( $P<0.05$ ) from 38.00 to 54.00 ml/200mg DM. Diet containing 20% MSPW produced highest ( $P<0.05$ ) volume of gas at 24, 42, and 48 hrs. Volume of gas produced in time (b) recorded highest value (15.552) in 60% MSPW. Fractional rate (c) of gas production (0.810-1.118 ml/hr) and lag time (0.952-1.098 hr) varied significantly ( $P<0.05$ ) across the dietary treatment. The pH (5.07), temperature (26.600C), ammonium nitrogen (15.60mg), metabolizable energy (9.54 MJ/KgDM), organic matter digestibility (62.89%), short chain fatty acids (1.23  $\mu\text{mol}$ ), gas volume h (54.00) and methane (7.50 ml) were significantly ( $P<0.05$ ) higher with inclusion level of 20% MSPW. It was therefore concluded that efficient gas production was attained in diet containing 20% MSPW which could serve as a valuable alternative animal feed source in ruminant production.

**Keywords:** Malted Sorghum Sprout, Pineapple Waste, In Vitro Gas Production

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**Target audience:** Ruminant Nutritionist, farmers and Researchers

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