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“Development on the margin”

In vitro Gas Production of some Tropical Grasses Using Inocula from Cattle, Sheep and Goats

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Abstract

This study was conducted to assess the nutritional value of *Panicum maximum*, *Andropogon gayanus* and *Brachiaria decumbens* as feed ingredients in the diet of cattle, sheep and goats. Although, feed tables are available on chemical composition and utilisation of forages by ruminants, their potentials as feed resources should be continually assessed with a view to ascertain ways of improving their use in livestock feeding systems. Chemical composition of the three grasses was determined. *In vitro* gas production was measured at 3,6,9,12,15,18,21,24,27,30,33,36,39,42,45, and 48 hours of incubation using inocula from cattle, sheep and goat. *In vitro* Organic Matter Digestibility (IVOMD), Metabolisable Energy (ME) and Short Chain Fatty Acid (SCFA) values were estimated.

Effect of interactions between ruminant species and grass species was analyzed. Results showed that proximate and fibre contents of *Andropogon* and *Brachiaria* were similar ($p > 0.05$) except their lignin contents. *Panicum* contained highest value of all the chemical components. Protein content of the three grasses ranged from 6.29 to 8.11 %, Ether extract was between 1.55 to 1.94 %. NDF values ranged from 58.08 to 61.09 %. Lignin content was between 8.97 to 9.86 %. Gas production by ruminants; a reflection of rate and extent of digestion, showed that cattle consistently produced highest ($p < 0.05$) volume of gas when fed different forages while gas production from *Panicum* was highest ($p < 0.05$) when consumed by different ruminant species. Significant differences occur in effect of interaction between forage and ruminant species. Cattle fed *Panicum* produced the highest volume of gas through out the incubation periods. The IVOMD of various grass species ranged from 32.29 to 35.79 % while that of animal species ranged from 32.90 to 33.89 %. ME values depend on forages, irrespective of animal species. SCFA of forages ranged from 0.23 to 0.29 $\mu\text{mol/g}$ while cattle fed *Panicum* had highest ($p < 0.05$) value (0.31 $\mu\text{mol/g}$). The study showed that the *Panicum*, *Brachiaria* and *Andropogon* species have potentials as a fibre source but would require supplementation with higher nitrogen feeds sources to meet the requirements for cattle, sheep and goats.

Keywords: Forage, *in vitro* gas production, ruminant