ABSTRACT

An *In vitro* Ruminal Nutritional Evaluation of Leaves from *Gliricidia Sepium*, *Leucaena Leucocephala* and *Trichanthera Gigantea* Forage Tree Species

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There is a paucity of information as it relates to the use of tree foliages to supplement poor quality grass in the diet of sheep and goats in Trinidad and Tobago. This study investigated the potential nutritive value of *Gliricidia sepium, Leucaena leucocephala* and *Trichanthera gigantea* in order to enable their use as supplements in grass-based diets in Trinidad and Tobago. The effect of three cutting intervals (6-, 8-, 12-week) on the biomass yield, chemical composition and *in vitro* ruminal organic matter digestibility (IVOMD) of tree species, *G. sepium, L. leucocephala* and *T. gigantea* was determined. Cutting intervals did not influence IVOMD, however, biomass yield increased with increasing cutting intervals. An *in vitro* tannin bioassay where tree leaves were incubated with and without polyethylene glycol (PEG), a tannin binding agent, was used to investigate the nutritional effects of tannins. A dose-response experiment demonstrated that 200 mg/g PEG DM of sample was sufficient to neutralize tannin effect in all tree species.

Crude protein (CP) and dry matter (DM) disappearance of leaves from *G. sepium, L. leucocephala* and *T. gigantea* were determined using the *in vitro* ruminal degradability technique. *In vitro* ruminal protein degradability was more pronounced in the leaves of *G. sepium* and *L. leucocephala* hence, indicating their ability to supply a readily available source of nitrogen (N) to microbes. In contrast, *T. gigantea* foliages contain higher concentrations of rumen undegradable protein suggesting that they can be used as a source of by-pass protein. The effect of incremental levels of *G. sepium, L. leucocephala* and *T. gigantea* leaves on *in vitro* ruminal fermentation parameters of tanner grass (*Brachiaria arrecta*) was investigated utilizing the Reading Pressure Technique. Gas production rate constant for the insoluble fraction increased by 100 % as the leaves of all species were included at 15 %.

It is concluded that tree foliages of the tree species (*G. sepium, L. leucocephala T. gigantea*) can be used to supplement grass-basal diets in Trinidad and Tobago.

Keywords: Chemical composition; *in vitro* ruminal degradability; tannins; Polyethylene glycol; forages; cutting intervals