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“Filling gaps and removing traps
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Methane Emissions of Zebu Steers Fed Tropical Forages of Contrasting Nutritional Value

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Abstract

Methane emissions from livestock contribute significantly to climate change and diet plays a fundamental role in the emissions generated. Research in animal nutrition should aim at identifying ways to increase production efficiency with the least possible environmental impact and manipulation of diet quality becomes one of the most viable options to both mitigate emissions and increase animal productivity. In this study, methane emissions of diets based on tropical forages differing in nutritional value and level of voluntary intake was evaluated. Methane emissions were measured in four animals per evaluated diet using the polytunnel technique. Forage voluntary intake was calculated as the difference of forage offered and rejected by each animal. Treatments evaluated corresponded to five different diets: T1: low quality *Brachiaria* hybrid cv. Cayman; T2: high quality *Brachiaria* hybrid cv. Cayman; T3: *Brachiaria* hybrid cv. Cayman + *Leucaena leucocephala*; T4: *Brachiaria* hybrid cv. Cayman + *Leucaena diversifolia*; T5: *Dichantium aristatum* hay. There was a tendency for the different evaluated parameters to improve when *Leucaena* was included. Treatments with *Leucaena* had higher protein, digestibility and dry matter (DM) intake (T3 and T4). The digestibility in the treatments varies in a range between 47.9% (T1) and 61.8% (T5), being the treatments with the lowest values. Methane emission per kg of dry matter intake was lowest in diets of better nutritional value (T3=27.5 g, T4=19.8 g) in contrast with treatments T1 (60.34) and T5 (35.9) with lower nutritional content. Diets with greater DM intake had the highest methane emissions (g day⁻¹). However, when emissions are expressed per kg of DM intake and/or digested, this relationship changes and it is the treatments with higher DM intake that have lower emissions per kg DM consumed and/or digested. The results of this study show that methane emissions decrease significantly when the nutritional value of the diet increases. Likewise, DM intake increases and therefore higher production parameters are also potentially attained.

Keywords: Dry matter intake, enteric methane emissions, polytunnel technique