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Benefits of *Leucaena diversifolia* in grazing steers diet: Performance, methane and fatty acids

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Abstract

Leucaena diversifolia (Ld) is a legume species that has received little attention in terms of its nutritive value, methane (CH₄) emissions, and impact on meat quality. To address this gap, a study was conducted to compare the performance, CH₄ emissions, and fatty acid content of steers grazing on a monoculture of tropical grass *Urochloa* hybrid cv. Cayman versus a combination of Cayman and Ld. Over a period of 15 months, 14 Angus crossbred steers weighing an average of 374±7.5 kg were used in the study, with half of them grazing only Cayman grass and the other half grazing on a combination of Cayman and Ld at a ratio of 74:26. Live weight gain was recorded and CH₄ emissions were measured after the animal productivity test. Meat quality and fatty acid profiles were measured after the steers were slaughtered.

The results showed that steers grazing on a combination of Cayman and Ld consumed more dry matter, crude protein, and energy per day than those grazing on grass alone, and this difference was still evident when digestibility was considered ($P \leq 0.05$). Moreover, animals grazing on a combination of Cayman and Ld weighed an average of 63 kg more at the end of the experiment compared to those grazing only Cayman (466 vs. 403 kg; $P \leq 0.05$). Interestingly, animals that consumed only Cayman grass emitted more CH₄ than those that included Ld in their diet (168 vs. 144 g d⁻¹; $P \geq 0.05$). The total polyunsaturated, monounsaturated, and saturated fatty acid concentrations in the meat did not differ between the two groups ($P \geq 0.05$).

In conclusion, incorporating Ld in the diet of grazing steers can increase nutrient intake (protein and energy) and animal productivity without affecting daily net CH₄ emissions or fatty acid concentrations in the meat. This study sheds light on the potential benefits of legume inclusion in animal diets and highlights the need for further research in this area.

Keywords: Animal productivity, grasses, silvopastoral systems, unsaturated fatty acids