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"Solidarity in a competing world — fair use of resources"

Sustainable Beef Production with Forage Associations in the American Tropics

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Abstract

Grass-legume forage associations are an alternative to address seasonality in feed supply in livestock systems, as they provide benefits in the production of biomass as well as in terms of diet quality and productivity. At the same time, they contribute to achieving sustainability of livestock production in the American tropics and thus play an important role in addressing national sustainability plans and strategies such as the Colombian Strategic Plan for Livestock Production (PEGA 2019) aiming at a reduction of the total area under pasture.

Under a completely randomised block design, three treatments with three repetitions were sown and evaluated for daily animal live weight gains in 2015: 1) the grass *Brachiaria brizantha* cv. Toledo as monoculture, 2) *Brachiaria brizantha* cv. Toledo associated with the legume *Canavalia brasiliensis*, and 3) *Brachiaria brizantha* cv. Toledo associated with *Canavalia brasiliensis* and *Leucaena diversifolia*. This resulted in a trial with a total of 9 experimental plots on 3.0 hectares. Once established, rotational grazing started with 15 commercial animals (male Zebu, 5 per treatment, initial live weight of 200 kg) and data was obtained for measuring daily live weight gains in relation to each treatment.

Results demonstrate that the animals with highest individual weight gains were the ones grazing *Brachiaria brizantha* cv. Toledo associated with the legume *Canavalia brasiliensis*, showing daily gains of 380 g, 125 g more than those grazing *Brachiaria brizantha* cv. Toledo only. With regard to overall productivity of each treatment, animals grazing grass-legume associations (treatment 2 and 3) showed higher per area live weight gains (554 and 526 $kg\,y^{-1}$) than those grazing *Brachiaria brizantha* cv. Toledo only (371 $kg\,y^{-1}$). The higher per area productivity of grass-legume associations is related to both forage quantity and quality. The results show that associations could be a valuable option for livestock producers in the tropics, for achieving higher productivity levels but also for sustainable intensification of livestock production systems and thus can contribute to compliance with national sustainability plans and strategies.

Keywords: Forage associations, live weight gain, sustainable intensification, tropical beef production, tropical forages

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