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Intake, Apparent Digestibility, and Nitrogen Balance in Steers Fed with different Grasses Grown alone or Intercropped with *Lablab purpureus*

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Abstract

Dry matter intake (DMI) and nutrient digestibility are major limiting factors for cattle productivity and nutrient use efficiency in tropical livestock systems. There is a lack of quantitative *in vivo* information on voluntary DMI, nutrient conversion and nitrogen (N) balance in tropical cattle fed tropical forage grasses grown alone or intercropped with forage legumes. The objective of this experiment was to investigate the effects of feeding three tropical grasses grown alone or intercropped with *Lablab purpureus* on DMI, apparent total tract digestibility (ATTD) and N balance in tropical cattle. Eighteen Boran steers of 230 ± 26.9 (mean \pm standard deviation) kg of live weight (LW) were used in a randomised block design with six experimental periods of 21 days (14 days of adaptation and 7 days of total urine and feces collection). Animals were stratified by LW and randomly allocated to four treatments: *Bracharia brizantha* alone (BA); *B. brizantha* intercropped with *Lablab* (BL); *Pennisetum purpureum* alone (PA); *P. purpureum* intercropped with *Lablab* (PL); *Chloris gayana* alone (CA) and *C. gayana* intercropped with *Lablab* (CL). Data (n=36) was analysed using the mixed procedure of SAS; the statistical model included grass species and intercropping as fixed factors as well as their interaction, and animal as random factor.

Daily DMI (BA=98; BL=100; PA=96; PL=98; CA=101; CL=111 g kg⁻¹ LW 0.75) did not differ between treatments ($p > 0.05$). The ATTD of the diet consumed by the steers was similar ($p > 0.05$) for grasses fed alone or intercropped (BA=614.2; BL=609.4; PA=625.3; PL=632.2; CA=597.1; CL=609.9 g kg⁻¹). Daily N balance was positive for all animals and tended to be higher ($p = 0.07$) when the forage grasses were intercropped with *Lablab* (BA=50.11; BL=65.2; PA=54.9; PL=63.8; CA=54.5; CL=57.4% of N intake).

A positive N balance indicates that the evaluated forage grasses satisfied the protein requirement of the steers. Feeding tropical forage grasses intercropped with forage legumes is a promising strategy to improve the nitrogen balance in tropical cattle.

Keywords: Forage legume, intake, nitrogen balance, tropical cattle