

Feed intake, apparent total tract digestibility, and nitrogen balance in Boran steers fed with three grasses grown alone or intercropped with *Lablab purpureus*.

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Introduction

There is a lack of quantitative *in vivo* information on voluntary dry matter intake (DMI), nutrient conversion and nitrogen (N) balance in tropical cattle fed tropical forage grasses grown alone or intercropped with forage legumes.

Objective

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.

Materials and Methods

- Eighteen Boran steers of 230±26.9 (mean±standard deviation) kg of live weight.
- Experimental design: randomized block design with six experimental periods of 21 days (14 days of adaptation and 7 days of total urine and feces collection).
- Total urine and fecal excretion was measured and feed samples were collected for analyses of nutrients composition.



Figure 1. Boran steer during adaptation period (left), Boran steer fitted with a urine collection device (right).

Experimental treatments:

- Brachiaria brizantha* alone
- B. brizantha* intercropped with *Lablab purpureus*
- Pennisetum purpureum* alone
- P. purpureum* intercropped with *L. purpureus*
- Chloris gayana* alone
- C. gayana* intercropped with *L. purpureus*.

Results

Table 1. Chemical composition (g/kg DM) of the three tropical grasses grown alone or intercropped with *Lablab purpureus* fed to Boran steers.

Variable (unit)	<i>B. brizantha</i>		<i>P. purpureum</i>		<i>C. gayana</i>	
	Alone	<i>Lablab</i>	Alone	<i>Lablab</i>	Alone	<i>Lablab</i>
Dry matter (g/kg FM)	267	267	169	172	298	283
Organic matter	890	892	869	879	889	896
Crude protein	80	77	83	77	68	68
Neutral detergent fibre	653	650	638	639	688	663
Acid detergent fibre	370	377	392	390	423	378

FM, fresh matter.

Table 2. Feed intake, apparent total tract digestibility and N balance of Boran steers fed three different tropical grasses grown alone or intercropped with *Lablab purpureus*.

Variable (unit)	<i>B. brizantha</i>		<i>P. purpureum</i>		<i>C. gayana</i>		SEM	P value
	Alone	<i>Lablab</i>	Alone	<i>Lablab</i>	Alone	<i>Lablab</i>		
DMI (kg DM/day)	6.7	6.3	5.8	6.7	6.1	6.1	0.08	0.54
ATTD (g /kg DM)	614	609	625	632	597	610	25.92	0.61
N intake (g N/day)	86 ^a	77 ^a	78 ^a	80 ^a	65 ^b	66 ^b	6.40	0.03
TNE (g N/day)	66	60	54	61	58	57	3.87	0.84
Fecal N excretion	42	35	26	31	35	35	0.96	0.76
Urine N excretion	24	25	27	29	23	22	4.16	0.77
N balance (g N/day)	20 ^a	16 ^a	24 ^a	20 ^a	6 ^b	9 ^b	6.74	0.05

N, nitrogen; DMI, dry matter intake; ATTD, apparent total tract digestibility; TNE, total nitrogen excretion; SEM, standard error of the mean.

^{a,b}Means within the same row without a common superscript differ ($P \leq 0.05$).

Conclusions

- Despite the differences in nutritional quality, the DMI and ATTD was similar for the three evaluated grasses.
- A positive N balance indicates that the evaluated forage grasses satisfied the nutrient requirements of the Boran steers.
- Intercropping did not improve the nutritional composition of the fodder, however this was likely due to the lower establishment and competition of *L. purpureus* with the grasses.