

Performance of young Nelore bulls grazing marandu grass pasture at different heights

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Introduction

Brazil is one of the largest beef cattle producers in the world with approximately 200 M head. The Industry relies predominantly on warm-season grass pastures, with approximately 90% of animals finished on pastures.

One of the main factors for the intensification of animal production systems based on pasture is appropriate management. Adjustment of stocking rate to maintain optimum forage allowance is essential. Studies on forage allowance have resulted in a better understanding of the response of forage crops and animals to changes in grazing intensity.

The purpose of this study was to evaluate management strategies for beef cattle systems grazed at different heights (15, 25 and 35 cm) in *Brachiaria brizantha* cv. Marandu in terms of pasture production and animal performance.

Material and Methods

The experiment was conducted at Animal Science Department, São Paulo State University, Jaboticabal, SP, Brazil (21°15'22" S, 48°18'58" W; 595 m asl). The trial was set up in an area of *Brachiaria brizantha* cv. Marandu pastures established in 2001 on a red latosol.

Fertilizer was applied at the rate of 90 kg N/ha in the rainy season. According to the Köppen classification, the climate of Jaboticabal is characterized as Awa, or subtropical with dry winters and rainy summers. The

experimental period was from January to April 2012 during the rainy season. Experimental paddocks (6.0 ha) were managed under continuous stocking, with variable stocking rates to give 3 grazing heights (15, 25 and 35 cm) using young Nelore bulls.

Forage quantitative and structural components were measured monthly using samples collected from the sites at medium height and separated into leaf blades, stems and leaf sheaths, and dead matter. All forage included within the perimeter of the rising plate (0.25 m²) was collected at soil level. Individual animal performance was measured by weighing animals at the start and end of the experiment, after a 12-hour period of complete fasting.

Data were analyzed by a complete randomized design with 3 grazing heights and 2 replications (paddocks) with 6 animals per paddock, and harvest date in repeated measures over time. Data were analyzed using the GLM procedure of SAS.

Results and Discussion

Total herbage mass and leaf and stem proportions decreased, and dead material increased along the 4-month experimental period (Table 1). Herbage mass increased in response to grazing height, while structural characteristics did not respond uniformly to grazing height.

With the decline in both rainfall and temperatures in March–April in Brazil, tropical grasses begin to senesce, resulting in a higher proportion of stem and dead material, with the effect most obvious in swards managed at greater heights. In general, crude protein and digestibility values decreased, while cell wall increased over the experimental period.

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Table 1. Total herbage mass and mass of the components in *Brachiaria brizantha* cv. Marandu pastures managed at 3 forage heights under a continuous stocking system during the 4-month rainy season.

Variable	Height (cm)	27/01/2012	25/02/2012	23/03/2012	21/04/2012
Forage mass (kg/ha)	15	6542Ca ¹	4934Cb	3524Cc	2114Cd
	25	8297Ba	8646Ba	7208Bb	5770Bc
	35	13512Aa	11614Ab	10058Ac	8502Ad
Leaf mass (%)	15	38.7Ba	33.9Ab	24.9Ac	16.0Ad
	25	44.5Aa	31.1Ab	25.0Ac	18.9Ad
	35	37.4Ba	34.3Ab	26.0Ac	17.7Ad
Stem mass (%)	15	28.5Ab	31.9Aa	27.6Bb	23.2Cc
	25	28.2Ab	33.3Aa	30.6Ab	27.9Bc
	35	26.3Ab	32.3Aa	31.4Aa	30.6Aa
Dead mass (%)	15	32.7Bd	34.1Ab	47.4Bc	60.7Aa
	25	27.2Cd	35.5Ab	44.3Ac	53.0Ba
	35	36.2Ac	33.3Ad	42.4Ab	51.6Ba

¹Means followed by the same lower-case letters in rows and upper-case letters in columns for each analyzed factor are not significantly different according to Tukey's test at 10% probability.

Animal ADG increased in response to pasture height (Table 2), mainly related to higher herbage allowance in this pasture. According to Poppi and MacLennan (2007), average daily weight gain from tropical pastures during

the wet season ranges from 0.5 to 0.7 kg/d depending on herbage allowance. Our observations at the greater herbage heights conform with this suggestion.

Table 2. Initial and final weights and performance of young Nelore bulls grazing *Brachiaria brizantha* cv. Marandu pastures at 3 different heights during the rainy season.

Height (cm)	Variable			
	IW (kg)	FW (kg)	ADG (kg/d)	AG (kg/ha/d)
15	243.0a ¹	279.2c	0.3b	2.5c
25	242.6a	314.9b	0.6a	3.6 ^a
35	245.9a	330.0a	0.7a	3.2b

¹Means followed by the same lower-case letter within columns for each analyzed factor are not significantly different according to Tukey's test at 10% probability.

Conclusion

While increasing herbage grazing height increased animal weight gains, there was a plateauing effect between 25 and 35 cm. The increased grazing pressure to maintain pastures at the lower height more than compensated for the slightly higher daily gains at the higher grazing height. Grazing intensity should be manipulated to obtain a compromise between gains per individual and gains per hectare.

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