

Protein-energy supplementation of Nellore heifers grazing Marandu pastures during the rainy season in Central Brazil

Rodrigo C. Gomes ^{*1}, Sérgio R. Medeiros¹, Roberto G. Almeida¹, Carolina T. Marino¹, Thaisa C. A. Cruz², Lidiane Pescke², Caroline V. Andrade³

¹Scientific Researcher, Embrapa Beef Cattle; 830 Av. Radio Maia, Campo Grande, MS, 79106-550; ²State University of Ponta Grossa, Ponta Grossa, PR; Catholic University Dom Bosco, Campo Grande, MS.

*Corresponding author: rodrigo.gomes@embrapa.br

Enhanced growth of beef heifers during the rainy season may be especially desirable when the aim is to harvest them at the season end or to breed them in the autumn breeding season of Central Brazil. Therefore, the objective of this study was to evaluate the effects of protein-energy supplementation on supplement intake and performance of grazing heifers. The study was carried out at the National Center of Beef Cattle Research, Embrapa Beef Cattle, in Campo Grande, MS. Seventy-nine Nellore heifers, with 278.0 ± 3.5 kg of initial body weight (BW) and 24 mo of age were allotted to one of eight groups which were kept in eight 4-ha paddocks with Marandu grass (*Brachiaria brizantha* cv. Marandu) and alternate to other 4-ha paddock every weighing that was carried out each 28 days. From November 14th 2012 to January 24th 2013, four of the eight groups received a protein-energy supplement (PES, Fosbovi PE 45 Águas, Tortuga Companhia Zootécnica Agrária), whereas the other four groups received a free-choice mineral mixture (Control, Foschromo, Tortuga Companhia Zootécnica). On January 25th 2013, the treatments were switched and thereafter the groups that received the mineral mixture had access to the protein-energy supplement and vice versa. The end of the experimental period was in April 4th 2013 and the duration of the first and the second periods were 71 and 75d, respectively. The delivery rate of PES was determined to be 1.7 g kg^{-1} BW per day; however, the amount respective to a whole week recommendation was split into three parts and provided on Mondays, Wednesdays and Fridays. The warranted chemical composition per kg^{-1} of PES was: 600 g TDN; 450 g CP; 306 g NPN Equi. Prot.; 25 g Ca; 18 g P; 10 g S; 15.6 g Na; 3 mg Co; 250 mg Cu; 5.7 g Cr; 10 mg I; 400 mg Mn; 3 mg Se; 700 mg Zn. The warranted chemical composition per kg^{-1} of mineral mixture was: 107 g Ca; 88 g P; 12 g S; 126 g Na; 60 mg Co; 1,530 mg Cu; 30 g Cr; 1,800 mg Fe; 75 mg I; 1,300 mg Mn; 15 mg Se; 3,630 mg Zn). The average (\pm standard deviation, SD) forage availability at the end of the second period was $3508 \pm 506 \text{ kg ha}^{-1}$ and the percentage (\pm SD) of leaves and stems were $28 \pm 6\%$ and $33 \pm 4\%$, respectively (dry basis). The average daily gain (ADG) was calculated as the slope of the linear regression of BW on weighing dates. The experimental design was a cross over design with four replicates (paddocks) per treatment. Data were submitted to analysis of variance with a significance level of 5%. The average supplement intake was 582 g/d for PES and 123 g/d for the mineral mixture ($P < 0.0001$). The average stocking rate was 1.77 animal units ha^{-1} and did not differ across treatments ($P > 0.05$). Least square means for PES heifers showed greater final BW (353 vs. 346 kg, $P < 0.01$), total BW gain (58.8 vs. 44.8 kg; $P < 0.01$) and ADG (0.803 vs. 0.610 kg/d; $P < 0.01$) than control. Considering a 55% dressing rate for the total BW gained, the PES was capable to provide an additional 0.5 @ of carcass per heifer in a 73d period, when compared to control. The use of protein-energy supplements throughout the rainy season of Central Brazil may be helpful to increase the body weight of grazing heifers at the end of the season either for slaughter or reproduction purposes.

Keywords: beef cattle, *Bos indicus*, Cerrado, tropical grass