GROSS ENERGY CONTENT IN INTENSIVELY MANAGED PASTURES ANDSILVOPASTORAL SYSTEMS IN SOUTHEAST BRAZIL DETERMINED BY SIMULATED FORAGE

CONTEÚDO DE ENERGIA BRUTA EM PASTAGENS DE SISTEMAS INTENSIVOS E SILVIPASTORIL NO SUDESTE DO BRASIL COLETADAS POR SIMULAÇÃO DE PASTEJO

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Abstract

Due to seasonality, the main factor responsible for low productivity of livestock is the lack of forage nutritional quality in some months of the year. This study evaluated the effects of intensification and integration in animal production systems on the gross energy (GE) content of simulated forage from September 2019 to September 2020 at Embrapa Southeast Livestock, São Carlos, SP, Brazil. Treatments, with two replicates, were: 1) intensively managed and irrigated *Megathyrsus maximus* cv. Tanzânia pasture with a high stocking rate, overseeded in the dry season with oats (*Avena byzantina*) and annual ryegrass (*Lolium multiflorum*) (IHS); 2) intensively managed rainfed *M. maximus* cv. Tanzânia pasture with a high stocking rate (RHS); 3) intensively managed rainfed pasture with a mix of *Urochloa decumbens* cv. Basilisk and *Urochloa brizantha* cv. Marandu pasture with a moderate stocking rate (RMS); 4) intensively managed silvopastoral system with *U. decumbens* cv. Basilisk pasture and Brazilian native trees (345 trees ha^{-1}), with a moderate stocking rate (LFS); and 5) extensively managed degraded pasture with a mix of *U. brizantha* cv. Marandu and *U. decumbens* cv. Basilisk with a low stocking rate (DP). All pastures were grazed by Nellore steers and submitted to stocking rate adjustments using the "put and take" technique. Stocking was continuous in DP and rotational in IHS, RHS, RMS, and LFS, with stocking cycles of 36 days. All pastures except DP were corrected with P, K, S and micronutrients. Pastures in the IHS and RHS systems were fertilized with 400 kg N ha^{-1} $year^{-1}$, and RMS and LFS with 200 kg ha^{-1} $year^{-1}$, applied during the rainy season. The IHS system was fertilized with 200 kg ha^{-1} $year^{-1}$ during the dry season. Two forage subsamples of all treatments were hand plucked for three consecutive days in each middle season of the year, collected considering the grazing behavior of the animals. Samples were dried in an oven (65 °C - 72 h), ground to 1 mm in a Wiley mill and subsequently analyzed for GE in a calorimeter. The statistical model considered treatments, seasons and the treatment*season interaction as fixed effects (n = 40) and means were submitted to analysis of variance and comparison by the Fisher test at 5%, using the PROC MIXED procedure of SAS. Significant treatment*season interaction was observed (P=0.0044). In the spring, summer and autumn seasons, higher GE values were found in the treatments with *Urochloa* spp (LFS, RMS and DP) when compared with those with *M. maximus* cv. Tanzânia (RHS and IHS) (P<0.05): LFS (4.44 mcal kg^{-1}), RMS (4.34 mcal kg^{-1}) and DP (4.33 mcal kg^{-1}), followed by RHS (4.06 mcal kg^{-1}) and IHS (4.02 mcal kg^{-1}) in spring; RMS and LFS (with 4.27 mcal kg^{-1} each) and DP (4.23 mcal kg^{-1}), followed by IHS (3.96 mcal kg^{-1}) and RHS (3.93 mcal kg^{-1}) in summer; LFS (4.16 mcal kg^{-1}), RMS (4.15 mcal kg^{-1}) and DP (4.09 mcal kg^{-1}), followed by IHS (3.90 mcal kg^{-1}) and RHS (3.86 mcal kg^{-1}) in autumn. During the winter, in comparison with the RHS system (3.73 mcal kg^{-1}), higher GE values were found in treatments with *Urochloa spp.* pastures (LFS 4.15 mcal kg^{-1}; RMS 4.13 mcal kg^{-1}; and DP 4.07 mcal kg^{-1}), and in the IHS treatment (4.12 mcal kg^{-1}), possibly due to the overseeding with cool-season forages. These results indicate that treatments with *Urochloa* spp. were able to maintain high values of GE during all seasons, except for IHS in the winter, while treatments with *M. maximus* cv. Tanzânia presented lower GE values, regardless of the intensification managements. The lignification process, the reduction in the proportion of leaves and the selective behavior of the animals may have affected the GE content during the seasons, and the overseeding with cool-season forages in the IHS treatment contributed to obtain higher GE values.

Keywords

Grazing systems, Gross energy, intensification, sustainability.