ZOOTECNIA BRASIL
Centro de Convenções da PUC-GO | Goiânia-GO
27 a 30 de agosto de 2018

55ª REUNIÃO ANUAL DA SOCIEDADE BRASILEIRA DE ZOOTECNIA

ZOOTEC 28º CONGRESSO BRASILEIRO DE ZOOTECNIA

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

NITROGEN METABOLISM IN LACTATING COWS UNDER DIETARY CATION-ANION BALANCES ON TROPICAL PASTURE

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Food technologies discovered over time such as the manipulation of the cation-anion balance (DCAB) must be enhanced to maximize animal production by efficiently meeting the energy and protein requirements of these animals. In this regard, the nitrogen metabolism is an important tool for assessing the use of dietary additives, since the microbial protein is the main source of amino acids for ruminants. The objective of this study was to evaluate the nitrogen metabolism of lactating cows on tropical pasture under DCAB. Ten lactating ¾ Holstein × ¼ dairy Gyr cows in the middle third of lactation, at an average age of 70 ± 4.6 months and an average body weight of 400 ± 55.2 kg, were distributed into five treatments in a 5×5 Latin square design with two simultaneous squares. Treatments consisted of diets with the DCABs of +237, +258, +294, +347, or +419 mEq DM. On the 15th day of the experiment, spot urine samples were collected during spontaneous urination of the animals approximately four hours after the morning supply of the concentrate. Samples were filtered through gauze and a 10-mL aliquot was separated and diluted with 40 mL sulfuric acid (0.036 N) to quantify the urinary concentrations of urea, nitrogen, creatinine, allantoin, and uric acid. Urinary concentrations of urea, creatinine, and uric acid were estimated using commercial kits (Bioclin). The urinary contents of allantoin and uric acid were estimated by colorimetric methods, and the total nitrogen content was estimated by the Kjeldhal method. The nitrogen balance was calculated as follows: Retained N = N intake (g) – N feces (g) – N urine (g). Results were analyzed statistically by variance and regression analyses at the 0.95 probability level using the SAEG (*Sistema de Análises Estatísticas e Genéticas*) software version 9.0. No significant effects were observed on urea, nitrogen, or nitrogen balance in cows receiving diets with different cation-anion balances on tropical pasture ($p > 0.05$). Daily excretion of purine derivatives did not show significant differences ($p > 0.05$) as a function of the DCAB to which the lactating cows were subjected, as was also observed for the urinary and milk excretions. The adopted diets and management strategies led to high concentrations of excreted and retained nitrogen, suggesting a decrease in nitrogen content in the diet formulation without negatively affecting performance, which may result in lower costs and prevent environmental problems.

Keywords: Electrolytic balance, Dairy cattle, Protein, Urea