Methane emission of young bulls grazing Marandu palisadegrass in different levels of pasture intensification

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We hypothesized that the improvement of grazing management by pasture fertilization will reduce enteric methane emission, contributing to its mitigation in Brazilian production systems. The experimental area consisted of 24 ha of Marandu palisadegrass pasture (Brachiaria brizantha 'Marandu') divided into 12 paddocks of approximately 2 ha each. The treatments consisted of three levels of intensification: zero (0N, no fertilization), moderate (75 kg N/ha/year; 75N) and high (150 kg N/ha/year; 150N), in a completely randomized design with four replicates (paddocks). The stocking rate over the experimental period was 1.7 (0N), 3.0 (75N) and 3.7 (150N) animal unit (animal unit = 450 kg)/ha. The source of N fertilizer was ammonium nitrate. Pasture were managed under continuous stocking to maintain grazing height fixed at 25 cm during the growing season, using the put-and-take methodology. Forty-eight tester and 31 put-and- take animals (initial body weight, BW of 295±16 kg) were used during rainy season that lasted from Nov 2018 until May 2019. The enteric methane emission was measured in 24 animals (8 per treatment) using the sulfur hexafluoride tracer-gas technique, in March 2019. The average daily gain (ADG) increased linearly ($P < 0.0001$) from 0.73 (0N) to 1.00 (150N) kg/d with increasing level of intensification. However, methane production did not differ among treatments ($P > 0.13$) and was in average 167.5 g CH_4/d or 212.6 g CH_4/kg ADG. Results indicate no effect of intensification achieved through N fertilization on individual enteric methane emission. São Paulo Research Foundation (FAPESP) (grant ≠ 2017/18750-7; 2018/26492-0).

Keywords: ammonium nitrate, continuous stocking, nitrogen, pasture, sulfur hexafluoride

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