

Methane and Short-Chain Fatty Acid Production from Nellore Steers in Pasture Intercropped with *Cajanus cajan*

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The study evaluated the enteric methane (CH₄) emission and short-chain fatty acid (SCFA) production of *Nellore* steers in three grazing systems under continuous stocking. The experiment was conducted at Embrapa Pecuária Sudeste, in Sao Carlos, SP, Brazil. Nine rumen-cannulated animals (15-16 months), weighing 280 kg, were evaluated in two seasons: rainy (January) and dry (July) seasons of 2021. The emission of CH₄ and production of SCFA were assessed by the Ex-situ ruminal fermentation technique at 0, 4, 8, and 12 hours after the onset of the evaluation and quantified by gas chromatography. The treatments were: 1) pasture with mixture of *Urochloa decumbens* cv. Basilisk and *Urochloa brizantha* cv. Marandu recovered with 200 kg N-urea/ha per year in the rainy season (REC); 2) degraded pasture of *U. decumbens* cv. Basilisk (DEG) and 3) pasture with a mixture of *U. decumbens* cv. Basilisk, *U. brizantha* Stapf cv. Marandu intercropped with *Cajanus cajan* cv. BRS Mandarin (CON). Each treatment was allocated in three replicated areas with 1.5 ha. The means were subjected to analysis of variance and compared by the Fisher test ($p < 0.05$), using the PROC MIXED of SAS. The CH₄ production differed between seasons: 23.1 and 13.2 g CH₄/kg DM per day during the rainy and dry seasons, respectively. The CH₄ emission in the DEG was greater than the other treatments with 19.7 g CH₄/kg DM per day, compared to 17.7 and 17.2 g CH₄/kg DM per day of the CON and REC, respectively. The total production of SCFA did not differ among the treatments but was different between the seasons with averages of 191 and 130 g CH₄/kg DM per day in the rainy and dry seasons, respectively. Cattle grazing degraded pasture emit more CH₄ than fertilized pasture or grass-legume consortium.

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