



Methane emission from Nellore cattle on intensified and integrated grazing systems in the seasons during two years consecutively

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Intensification and integration of grazing systems result in better animal performance and bring beneficial effects to the environment through the reduction of enteric methane emissions as well as improves growth and muscle development. This study allows pointing out which, among the most productive systems available (treatments), has/have the greatest potential to mitigate enteric methane production in two all seasons by years. The experiment was conducted at Embrapa Southeast Livestock, in Sao Carlos, SP, Brazil, for a total period of two consecutive years. A total of 40 steers (20 per year) Nellore (*Bos taurus indicus*), male, uncastrated, of approximately 280 kg live weight, and 15 to 16 months old, are being used as experimental animals, which were monitored for enteric methane production using the SF₆ technique. Grazing systems evaluated included: degraded pasture - I and J, dryland pasture with moderate stocking rate (*Urochloa decumbens*) - G and H, dryland pasture with high stocking rate (*Megathyrsus maximus*) - E and F, livestock-forest system with moderate stocking rate (*Urochloa decumbens* and wooded with native forest species) - K and L, irrigated pasture with high stocking rate (*Megathyrsus maximus*) - C and D. Using the Statistical Analysis System program (SAS 9.3 Inst. Inc., Cary, NC) the data were analyzed by PROC MIXED. In all tests performed, a 5% significance level was considered and means were compared using the LSD-Fisher. There were differences between the all treatments in all seasons ($P < 0.05$). A difference also appeared in the spring and summer seasons ($P < 0.05$), means methane emission was higher in the more intensified systems and lower in the integrated system (C and D - 104.3^a kg. year⁻¹; E and F - 97.01^{ba} kg. year⁻¹) with E and F equaling G and H - 91.3^{bc} kg. year⁻¹ these equaling I and J - 81.9^c kg. year⁻¹; K and L - 83.8^c kg. year⁻¹. Regarding the year, in spring and summer the animals emitted more methane ($P < 0.05$), with no difference in fall and winter ($P > 0.05$). Thus, there was no interaction between treatments and years ($P > 0.05$). So, we must conclude that depending on the intensification of the system, medium to high stocking rate, the animals arranged in them emit more methane compared to the integrated system and those of lower stocking rate such as G, H.

Keywords: Grazing, integrated, intensified, methane, Nellore, tropical seasons.

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