

**THEME 5 | GRASSLANDS AND FORAGES**

**Effect of grazing frequency on enteric methane emissions, output of milk constituents and milk yield**

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Grazing management changes sward structure, affecting forage morphological characteristics and nutritive value, and ultimately animal performance and enteric methane (CH<sub>4</sub>) emissions. The objective of this study was to evaluate enteric methane emissions and animal performance of lactating dairy cows grazing elephant grass (*Pennisetum purpureum* Schum. cv. Cameroon). Treatments corresponded to strategies of rotational grazing characterized by two pre-grazing targets; 95% and maximum canopy light interception (LI<sub>95%</sub> and LI<sub>Max</sub>, respectively). Post-grazing target corresponded to 50% of the pre-grazing targets. Twenty-two mid-lactation Holstein × Jersey cows (488 ± 60 kg) were stratified by body weight, days in milk (126 ± 90 days), lactation number (2.3 ± 1.2), and daily milk yield (20.3 ± 2.6 kg d<sup>-1</sup>) in a completely randomized design (n = 11). The 2.5 ha experimental area was divided into two sets of 18 paddocks (700 m<sup>2</sup>). Concentrate was offered twice daily before milking based on the average milk production of each group (1 kg of concentrate:3 kg of milk). Enteric CH<sub>4</sub> emissions were collected using the sulfur hexafluoride (SF<sub>6</sub>) tracer gas method. Dry matter intake (DMI) was determined using titanium dioxide as a marker. Sampling occurred during the grazing season from December 2015 to April 2016. Results were analyzed using the PROC MIXED of SAS (α = 0.05). There were no treatment effects on DMI (18.4 kg d<sup>-1</sup>, on average; P = 0.090) nor on daily CH<sub>4</sub> emissions (304.9 g d<sup>-1</sup> on average; P = 0.136). Therefore, there were no treatment effects on enteric CH<sub>4</sub> emissions per unit of feed consumed (17.3 g CH<sub>4</sub> kg DMI<sup>-1</sup>). However, cows grazing LI<sub>95%</sub> swards had greater milk (17.5 vs 14.6 kg d<sup>-1</sup>; P = 0.043), protein (0.55 vs 0.47 kg d<sup>-1</sup>; P = 0.029), fat (0.66 vs 0.55 kg d<sup>-1</sup>; P = 0.027), and milk solids yield (2.15 vs 1.79 kg d<sup>-1</sup>; P = 0.019). Consequently, the LI<sub>95%</sub> target resulted in lower enteric CH<sub>4</sub> emissions per unit of milk produced (16.7 vs 23.4 g CH<sub>4</sub> L<sup>-1</sup>, P = 0.002), per unit of milk protein (528.1 vs 703.5 g CH<sub>4</sub> kg<sup>-1</sup>; P = 0.003), per unit of milk fat (437.9 vs 606.5 g CH<sub>4</sub> kg<sup>-1</sup>; P = 0.001), and per unit of milk solids yield (135.2 vs 186.1 g CH<sub>4</sub> kg<sup>-1</sup>; P = 0.001). Grazing management based on the LI<sub>95%</sub> pre-grazing target resulted in increased output of milk constituents and milk yield, whilst reducing CH<sub>4</sub> emissions per unit of final product. These results are likely associated with increased forage nutritive value in LI<sub>95%</sub> swards, since no effects of pre-grazing targets were observed on DMI.

**Keywords:** light interception, *Pennisetum purpureum*, dairy cows

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