

Interaction between Concentrate Type and Pasture Mass on Methane Emission of Grazing Dairy Cows

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ABSTRACT: (may not exceed 300 words)

Supplementation with wheat-based concentrates and grazing a pasture mass of ~2200 kg dry matter/ha are feeding strategies that can decrease enteric methane emissions of dairy cows. The objective of this study was to evaluate the effects of combining these methane mitigation strategies to enhance their mitigation potential. We randomly assigned 48 Holstein Friesian grazing dairy cows to one of four treatments arranged in a 2 × 2 factorial design: low (2000 kg DM/ha) or high (3500 kg DM/ha) pregrazing herbage mass, crossed with supplementation with 6 kg/d of a wheat- or corn-based concentrate (composing 61% of concentrate DM) i.e. high herbage mass and corn (HPC), high herbage mass and wheat (HPW), low herbage mass and corn (LPC), and low herbage mass and wheat (LPW). The low herbage mass pasture treatments had higher crude protein ($P < 0.01$) and a tendency to lower ADF contents ($P = 0.06$). Milk production was higher ($P < 0.05$, +2.9 kg/d) with the LPW than with the HPW treatments, but did not differ from the LPC or HPC treatments. Total methane emissions were 9.7% lower for the low herbage mass than for the high herbage mass pasture treatments ($P < 0.01$). Methane emissions intensity was lower ($P < 0.05$, 26.0%) with the LPW than with the HPW treatments, differences that were not observed between the corn treatments. In conclusion, a lower herbage mass decreased methane production and intensity compared to a higher herbage mass, but supplying wheat-based concentrates did not decrease methane compared to corn-based concentrates, although methane intensity levels with wheat were affected by pasture mass. At the levels applied in this study, the combination of lower pasture mass pregrazing and wheat supplementation applied together to decrease methane emissions does not offer additional benefits than their separate effects.