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The effect of ribwort plantain (*Plantago lanceolata*) on enteric methane emission of dairy cattle during grazing

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Herb-rich grasslands are of increasing interest due to potential properties of reducing enteric methane (CH_4) emission and increasing biodiversity. The objective of this study was to compare enteric CH_4 emission of cows grazing on perennial ryegrass (*Lolium perenne*, LP) pastures with and without ribwort plantain (*Plantago lanceolata*, PL). Thirty-two dairy cows were blocked and assigned to one of the treatments: LP and LP with PL (LP-PL) in Duplo on adjacent pastures which received the same grassland management. Cows were continuously grazing for four weeks per period; two weeks of adaptation and two weeks of measurement period. The trial was repeated three times in 2022: May-Jun (period 1), Jul-Aug (period 2) and Sept-Oct (period 3). Enteric CH_4 emission was measured using GreenFeed systems (C-lock Inc.). Fresh grass intake was estimated using the net energy requirement (VEM) calculations. A restricted maximum likelihood (REML) analysis was done with pasture (1 / 2) and botanical composition (LP / LP-PL) as fixed effects and block as random effect. The CH_4 production and yield was significantly higher for LP-PL compared to LP ($P < 0.001$ and $P = 0.046$, respectively, Figure 1). This study did not show a CH_4 reduction potential of PL, but that may be due to the low proportion of PL in the pasture and the possibility for cows to select while grazing.

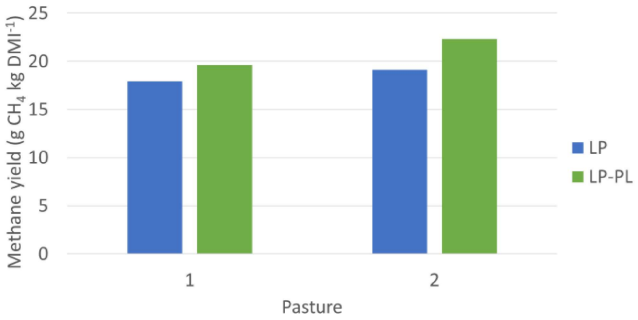

Figure 1. Methane yield (g CH_4 kg DMI^{-1}) per treatment group; Pasture 1 or 2 and with PL (LP-PL, in green) or without PL (LP, in blue).