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Enteric methane production in calves depends primarily on the farming system, not on breed

Background

Grass-based veal production could be a low-input solution

The impact of grazing on enteric methane emissions of young animals is not well assessed, yet

Methods

48 dairy male calves (Fig. 1)

- Dairy (Brown Swiss)
- Cross-breed (Limousin x Brown Swiss)
- Dual purpose / Dairy (Swiss Fleckvieh)

4 grass-based systems

- Indoor (FiBL)
- Intensive pastures (Wülflingen)
- Permanent pastures (Früebüel)
- Alpine pastures (Alp Weissenstein)

Oesophageal tubing
In vitro Hohenheim Gas Test

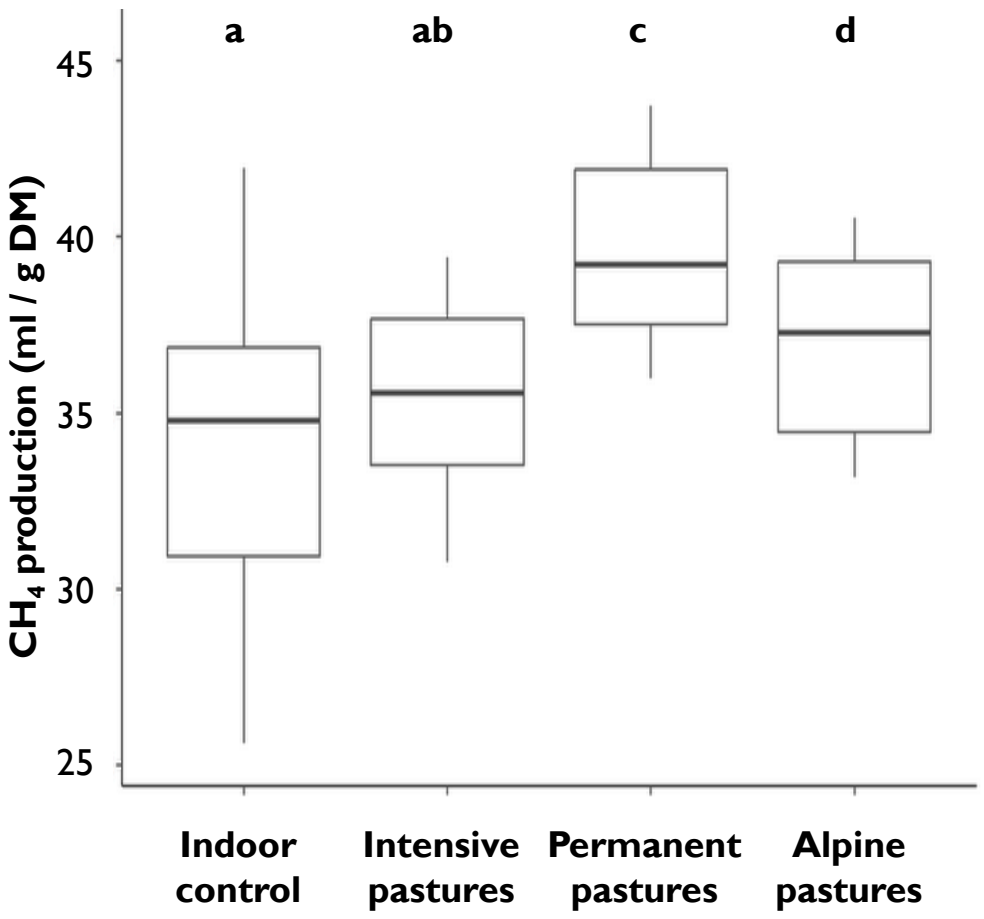
Model selection:
gas production ~ Breed * System + Time

Fig. 1: Grazing calves. From left to right: Limousin x Brown Swiss, Brown Swiss and Swiss Fleckvieh

Results and discussion

- Strong effect of farming system, minor effect of breed
- Highest total gas production in intensive systems, but…
- higher potential CH_4 production in extensive systems
- Unexpected results: multispecies pastures decrease CH_4 production in the literature
  (e.g. Hassan et al., 2025)
- In vitro and CH_4 emissions from calves are similar to adult cattle
  (e.g. Khiaosa-ard et al., 2012; Massaro et al., 2025; Wang et al., 2018)

In vitro methane production per system



References
Hassan et al. (2025) Animal, 19 (1), 101386
Khiaosa-ard et al. (2012) Animal, 6 (11), 1764-1773
Massaro et al. (2025) Ital. J. Anim. Sci., 24 (1) 711-727
Wang et al. (2018) Can. J. Anim. Sci., 98 (1), 61-72

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