



## Methane emissions from feedlot cattle fed barley or corn diets

Beauchemin KA<sup>1</sup>, McGinn SM.

<sup>1</sup>Agriculture and Agri-Food Canada, Research Centre, Lethbridge, Alberta, Canada

### Abstract

Methane emitted from the livestock sector contributes to greenhouse gas emissions worldwide. Understanding the variability in enteric methane production related to diet is essential to decreasing uncertainty in greenhouse gas emission inventories and to identifying viable greenhouse gas reduction strategies. Our study focused on measuring methane in growing beef cattle fed corn- or barley-based diets typical of those fed to cattle in North American feedlots. The experiment was designed as a randomized complete block (group) design with two treatments, barley and corn. Angus heifer calves (initial BW = 328 kg) were allocated to two groups (eight per group), with four cattle in each group fed a corn or barley diet. The experiment was conducted over a 42-d backgrounding phase, a 35-d transition phase and a 32-d finishing phase. Backgrounding diets consisted of 70% barley silage or corn silage and 30% concentrate containing steam-rolled barley or dry-rolled corn (DM basis). Finishing diets consisted of 9% barley silage and 91% concentrate containing barley or corn (DM basis). All diets contained monensin (33 mg/kg of DM). Cattle were placed into four large environmental chambers (two heifers per chamber) during each phase to measure enteric methane production for 3 d. During the backgrounding phase, DMI was greater by cattle fed corn than for those fed barley (10.2 vs. 7.6 kg/d,  $P < 0.01$ ), but during the finishing phase, DMI was similar for both diets (8.3 kg/d). The DMI was decreased to 6.3 kg/d with no effect of diet or phase while the cattle were in the chambers; thus, methane emissions (g/d) reported may underestimate those of the feedlot industry. Methane emissions per kilogram of DMI and as a percentage of GE intake were not affected by grain source during the backgrounding phase (24.6 g/kg of DMI; 7.42% of GE), but were less ( $P < 0.05$ ) for corn than for barley during the finishing phase (9.2 vs. 13.1 g/kg of DMI; 2.81 vs. 4.03% of GE). The results indicate the need to implement dietary strategies to decrease methane emissions of cattle fed high-forage backgrounding diets and barley-based finishing diets. Mitigating methane losses from cattle will have long-term environmental benefits by decreasing agriculture's contribution to greenhouse gas emissions.

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