

# The Effect of Inoculated Corn Silage Diet on Rumen Fermentation and Lipid Metabolism in an Artificial Rumen

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Two experiments in artificial rumen (RUSITEC) within 30 days were performed; the effects of diets containing corn silage (12 g of DM/day) and lucerne hay (3 g DM/day) in which the corn was not inoculated (CS, control), inoculated with *Lactobacillus plantarum* CCM 4000 (CS+LP), *Lactobacillus fermentum* LF2 (CS+LF) and *Enterococcus faecium* CCM 4231 (CS+EF) without (experiment 1), and with sunflower oil (SO) supplementation (experiment 2) on rumen metabolism were examined. The diets were fermented in four fermentation vessels for 12 days. The counts of inoculants decreased during ensiling of corn, and at the end of ensiling (105 days), the counts of inoculants were less than 1.0 log<sub>10</sub> cfu/g in corn silages probably for lower pH (3.44-3.54). Dry matter and detergent fibre degradabilities, as well as methane, ammonia and VFA production were similar in all fermented diets, in both experiments, in RUSITEC. On the other hand, the inoculated CS diets significantly increased the production of acetate, n-butyrate, but not propionate. In the other experiment, the supplementation of SO significantly decreased the production of acetate, propionate and n-butyrate. The efficiency of microbial protein synthesis (EMS) was similar in inoculated CS diets, but, EMS values were lower in the diets supplemented with SO about 7.4 (CS), 3.9 (CS+LP), 1.3 (CS+LF) and 7.6 (CS+EF) units compared to un-supplemented diets. The biohydrogenation (BH) of C<sub>18:1</sub>, C<sub>18:2</sub>, total C<sub>18</sub> FA, but not C<sub>18:3</sub> significantly increased in inoculated CS diets. The supplementation of SO significantly decreased BH of C<sub>18:1</sub>, C<sub>18:2</sub> and total C<sub>18</sub> FA in CS diets, except CS+LF diet. The concentrations of *trans* 11 C<sub>18:1</sub> (TVA) and *cis* 9, *trans* 11 C<sub>18:2</sub> (CLA) decreased with the fermentation of inoculated CS diets in experiment 1. On the other hand, the supplementation of SO significantly increased the concentration of TVA and CLA in CS diets, mainly CS+LF, CS+EF (TVA) and CS (CLA). It can be concluded, that all three inoculants in corn silages were not effective for increase CLA and TVA concentration in fermentation fluid and for decrease of rumen BH of C<sub>18</sub> fatty acids in RUSITEC. However, addition of sunflower oil positively enhanced the production of rumen intermediates (TVA, CLA).

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