

Evaluating the Effects of Fibrolytic Enzymes on Rumen Fermentation, Omasal Nutrient Flow and Production Performance in Dairy Cows during Early Lactation

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The current study was performed to evaluate the effects of pre-treating barley silage based-diet with exogenous fibrolytic enzymes resulting from *Trichoderma reesei*-derived fungal extract (FETR) on lactational performance, duodenal nutrient flow and digestibility, rumen fermentation characteristics, and rumen pH profile in Holstein dairy cows during early lactation. The dairy trial conducted using nine Holstein dairy cows (averaging 46 ± 24 days in milk and 697 ± 69 kg, 6 cows were fitted with a rumen cannula and three non-cannulated). Two groups of cows were randomly assigned to each of the dietary treatments in a crossover design: control (without supplementation) and supplemented (with 0.75 mL of FETR/ kg DM of diet). The experiment consisted of two consecutive experimental periods of 27 days each. Within each period, the first 18 days were used for adaptation to the treatments, followed by 3 d of milk sampling, and 3 days for the collection of the ruminal, omasal and fecal samples, and the last 3 days for measuring the pH profile using indwelling pH probes. The application of FETR tended to decrease the DM and OM intakes. There was numerical improving (about 15 percent increase) in OM and NDF digestion in the rumen. The milk yield was not affected by FETR supplementation, however there was numerical improvement in the feed efficiency because of pre-treating the barley silage-based diet with FETR compared to control. There was significant decrease in milk urea nitrogen and numerical decrease in ruminal ammonia concentration as consequence of adding FETR to the diet.

Implications: Dairy cows fed pre-treated barley silage-based diet with FETR extracted from *Trichoderma reesei*-derived fungal extract could decrease the feed intake with maintaining the milk yield. This positive effect of adding FETR could benefit the dairy industry in Western Canada where barley silage-based diets are common.