

Determining the optimal dosage of an innovative fibrolytic enzyme on NDF and DM degradability and kinetics of whole crop faba bean silage in western Canada

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The main objective of this study was to determine the optimal dosage level of fibrolytic enzyme solution (derived from *Trichoderma reesei*; a mixture of xylanase and cellulase; AB Vista, Marlborough, UK) when applied to faba bean silage (*Vicia faba* L.). The faba bean silage was dried at 55°C for 48 hours and ground through a 1-mm screens using a Wiley mill. Seven doses of the enzyme: 0, 0.25, 0.50, 0.75, 1.00, 1.25 and 1.50 mL of enzyme/ kg DM of silage were applied directly onto the substrate for both *in situ* and *in vitro* analysis for 0, 6, 24, and 48 hours of incubation time. Four cannulated lactating dairy cows at Rayner Dairy Research and Teaching Facility (RDRTF, University of Saskatchewan) were used for the *in situ* study. Two ANKOM Daisy¹¹ incubators (ANKOM Technology, Macedon, New York, USA) were used for the *in vitro* study. The *in situ* results showed that there was a cubic ($P<0.05$) effect of enzyme dose levels on DM degradability (DMD) and a quadratic ($P<0.01$) effect on the neutral detergent fiber degradability (NDFD) of faba bean silage. There was no effect of the enzyme dosage level ($P>0.05$) on DM degradation rate (Kd), however there was a significant linear effect on Kd of NDFD. Similar results were observed in the *in vitro* study, with a quadratic ($P<0.01$) effect on *in vitro* DMD and a cubic ($P<0.01$) effect on *in vitro* NDFD of the faba bean silage. **Implications:** This study demonstrated that the new generation of fibrolytic enzyme solution has a potentially positive effect on DMD, NDFD and kinetics of faba bean silage. Further study is required to examine the effect of the fibrolytic enzyme on the lactational performance, and nutrient digestibility in high producing dairy cows fed with a faba bean silage based diet.