

# The Effect of Fibrolytic Enzymes on Lactation Performance, Feeding Behavior, and Digestibility of High Producing Dairy Cows Fed Barley Silage Based Diet

Basim Refat<sup>1</sup>, David Christensen<sup>1</sup>, John McKinnon<sup>1</sup>, Aaron Beattie<sup>2</sup>, Wenzhu Yang<sup>3</sup>, Tim McAllister<sup>3</sup>, and Peiqiang Yu<sup>1\*</sup>

<sup>1</sup>Department of Animal and Poultry Science, College of Agricultural and Bioresources, University of Saskatchewan, 51 Campus Drive, Saskatoon, SK, S7N 5A8

<sup>2</sup>Crop Development Center, University of Saskatchewan, 51 Campus Drive, Saskatoon, SK, S7N 5A8

<sup>3</sup>Agriculture and Agri-Food Canada, 5403 - 1 Avenue South, Lethbridge, Alberta T1J 4B1

\*Corresponding author: Email: peiqiang.yu@usask.ca; Tel: 306 9664132

The objectives of this study were to evaluate the effects of pre-treating dairy cow rations with a fibrolytic enzyme derived from *Trichoderma reesei*-derived fungal extract (FETR) on lactation performance, digestibility, and feeding behavior of dairy cows fed a barley silage-based diet. Before starting the in vivo experiment, in vitro incubations were conducted to see whether or not this product would have a positive response before proceeding to animal experiments (0, 0.25, 0.5, 0.75, 1, and 1.25 ml of FETR / kg DM of silage) to be applied to a barley silage-based diet for experiments using dairy cows. The dairy trial was performed using eight Holstein dairy cows. Cows were blocked by their parity and assigned randomly to one of four treatments: 0, 0.5, 0.75, and 1 ml of FETR / kg DM of diet in a replicated Latin square design. The pre-treatment was applied to the complete diet during the mixing process. The application of FE linearly increased in vitro DM digestibility and tended to improve the in vitro NDF digestibility in barley silage. Applying FETR quadratically increased the fat corrected milk and energy corrected milk and tended to increase feed efficiency. The milk fat yield was also quadratically increased by the application of FETR. The milk protein percentage linearly improved by applying the FETR.

Implications: Pre-treating dairy cow barley silage-based diet with FETR extracted from *Trichoderma reesei*-derived fungal extract increased the feed efficiency without affecting DMI. This beneficial effect of adding FETR could benefit the dairy industry in Western Canada where barley silage-based diets are common.