

The Effects of Replacing Barley Silage or Barley Grain with Dried Distillers Grains Plus Solubles on the Productivity of Lactating Dairy Cows

S. Z. Zhang, G. B. Penner and M. Oba

Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, T6G 2P5

Email: moba@ualberta.ca

Dried distillers grains plus solubles (DDGS) are commonly used as a protein source in diets for dairy cows. Further, DDGS may also be used as a source of forage or energy due to the high content of readily fermentable fiber and fat, respectively. However, there is a paucity of data evaluating the use of DDGS as a partial replacement of forage or grain.

The objective of this study was to determine the effects of replacing barley silage or barley grain with DDGS on dry matter intake (DMI), chewing activity, rumen pH, and milk yield and composition. Six ruminally cannulated lactating Holstein cows (160 ± 97 days in milk) were used in a replicated 3×3 Latin square design. Cows were fed a control diet (45% barley silage, 5% alfalfa hay, and 50% concentrate mix) or diets containing corn-and-wheat based DDGS replacing either barley silage or barley grain at 20% of dietary dry matter (DM), respectively.

Replacing barley grain with DDGS did not affect any response variables measured in this study. However, partially replacing barley silage with DDGS increased DMI (26.0 vs. 22.4 kg/d), milk yield (36.4 vs. 33.0 kg/d) and milk protein yield (1.18 vs. 1.05 kg/d). Further, partially replacing barley silage with DDGS decreased chewing time (29.7 vs. 39.1 min/kg DMI), likely due to reduced intake of large particles (2.70 vs. 3.61 kg/d; the intake of particles retained on the 19- and 8-mm screens of the Penn State Particle Separator). Although chewing activity was reduced, milk fat yield, mean rumen pH and the duration of time that rumen pH was below 5.8 were not affected by feeding DDGS in place of barley silage.

Implications: The results of the current study demonstrate that DDGS can effectively be used as a replacement for barley grain or barley silage without negatively impacting production. In fact, partially replacing barley silage with DDGS may improve the productivity of lactating dairy cattle providing diets contain sufficient effective fiber.