

Can We Use Dried Distillers Grains with Solubles as a Partial Replacement of Forage?

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

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

Email: moba@ualberta.ca

In western Canada, wheat-based dried distillers grains with solubles (**DDGS**) is available as a by-product feedstuff for animals. As wheat DDGS is high in fibre content, it may be used as a partial replacement of forage in diets for lactating dairy cows particularly when forage is in short supply. The objective of this study was to determine the effects of feeding DDGS as a partial replacement of barley silage in diets for lactating dairy cows. Thirty multiparous lactating Holstein cows including 6 ruminally cannulated cows were assigned to one of three dietary treatments in a 3 × 3 Latin square design with 21-d periods. Cows were fed the control diet (**CON**: 50% barley silage, and 50% concentrates mix on a DM basis), the diet partially replacing barley silage with DDGS (**DG**: 30% barley silage, 20% DDGS, and 50% concentrates mix on a DM basis), or the diet partially replacing barley silage with DDGS and alfalfa hay (**DG+AH**: 20% barley silage, 20% DDGS, 10% alfalfa hay, and 50% concentrates mix on a DM basis). Inclusion of alfalfa hay (i.e., DG+AH diet) was expected to prevent reduction in milk fat concentration when cows were fed a high DDGS diet.

Cows fed DG and DG+AH diets had greater dry matter intake (23.1, 22.7 vs. 20.1 kg/d), body weight gain (1.17, 1.23 vs. 0.25 kg/d), and yields of milk (27.3, 28.1 vs. 24.5 kg/d), milk protein (0.99, 1.01 vs. 0.88 kg/d) and milk lactose (1.24, 1.29 vs. 1.11 kg/d) compared with cows fed the CON diet. However, compared with the CON diet, diets containing DDGS (DG and DG+AH) decreased chewing time (30.7, 31.5 vs. 38.3 min/kg DMI) and mean rumen pH (5.88, 5.84 vs. 6.11), and increased the duration of rumen acidosis (time that rumen pH was below 5.8; 11.2, 12.0 vs. 7.3 h/d). These response variables did not differ between cows fed DG and DG+AH diets. Milk fat yield was not affected by treatment, but milk fat concentration was highest for the CON diet, followed by DG and DG+AH diets (3.92, 3.60, and 3.38%, respectively).

Implications: Wheat-based DDGS can be used as a partial replacement of forage. Substitution of DDGS for barley silage is expected to increase milk yield, but we need to be aware of the risk of low milk fat concentration. Dietary inclusion of alfalfa hay may not alleviate the reduction in milk fat concentration when DDGS are used as a partial replacement for barley silage.