

Food Waste as Animal Feed: Wet Brewers and Wet Distillers Grains In Dairy Cattle Diets October 2021

Introduction

Brewers and distillers grains have been used as animal feeds for centuries. Brewers grain is a co-product of brewing beer. Distillers grains are a co-product of ethanol production. The commercial feed industry routinely uses dried forms of these co-products in manufacturing grain mixes. Wet brewers (WBG) and wet distillers (WDG) grains may also be available and used as feeds on farms. Nutrient composition of WBG and WDG vary depending on the processing plant and the grain sources (barley, rice, corn, wheat) used. Using WBG and WDG as animal feed recycles feed nutrients and reduces the environmental impact of disposal in landfills, incineration, and composting. Using these feeds on the farm can also help in controlling purchased feed costs and improving profitability.

Nutrient Composition

Table 1 contains typical nutrient composition of WBG and WDG. Both the average value and the standard deviation are included. The standard deviation is a measure of variability. A larger standard deviation indicates more variability. The standard deviation is a good value to pay attention to because it represents the variability in the diet additive that will be received. These results represent samples from multiple processing plants using different grain sources and processing techniques. Variability is expected to be lower when repeated samples from one plant are analyzed. Both WBG and WDG are medium level protein and fiber sources. Phosphorus is high in both feeds which may limit the amount used in some dairy diets balanced to meet nutrient management plans. Potassium is low which is beneficial

for inclusion in dry cow diets to lower the risk of post-calving milk fever or subclinical hypocalcemia. The dry matter of WDG in Table 1 includes both wet and partially dried samples. A dry matter of 30 - 40% is more typical of WDG that have not been dried.

Table 1. Nutrient Composition of Wet Brewers and Wet Distillers Grains ^a.

Item	Wet Brewers Grain	Wet Distillers Grain
Dry matter, %	20.6 (9.7) ^b	51.6 (27)
Crude Protein, % of DM	27.4 (4.9)	30.4 (7.5)
Soluble Protein, % of CP	12.9 (7.2)	18.9 (6.6)
Acid Detergent Fiber, % of DM	24.3 (3.5)	17.3 (4.5)
Neutral Detergent Fiber, % of DM	47.4 (5.8)	35.7 (7.9)
Starch, % of DM	4.5 (3.8)	4.1 (3.3)
Fat, % of DM	10.3 (1.6)	10 (3.1)
Ash, % of DM	4.6 (0.9)	5.1 (1.7)
Calcium, % of DM	0.31 (0.11)	0.10 (0.05)
Phosphorus, % of DM	0.67 (0.09)	0.8 (0.25)
Magnesium, % of DM	0.22 (0.03)	0.26 (0.1)
Potassium, % of DM	0.12 (0.16)	0.89 (0.54)
Sulfur, % of DM	0.33 (0.06)	0.5 (0.15)
Net Energy Lactation, Mcal/lb.	0.84 (0.04)	0.89 (0.06)

^a Samples analyzed at Dairy One Forage Lab between 5/2019 and 4/2020.

^b Standard deviation.

Diet Inclusion Levels

Workers at the University of Wisconsin suggest a feeding rate of WBG of 20 - 40 pounds on an as-fed basis. Research has included up to 30% of the total ration dry matter from WDG. A more practical guideline for WDG is up to 10 - 15% of the total ration dry matter. The actual amount used in a specific ration will vary depending on the forages and other feeds available to formulate a nutritionally balanced diet.

Storage Considerations

Wet feeds have a short shelf life before spoilage and mold growth occurs. This time varies with weather conditions. In the cooler months of the year, this may be 5 - 10 days. However, in hot and humid weather, this may only be 2 - 4 days. This requires that the

daily feed use on the farm is adequate to use each load before spoilage occurs.

Longer term storage can be done by using silage bags. This is an option that fits best in small or medium size herds that can't use the feed fast enough before spoilage occurs.

Conclusion

Wet brewers and wet distillers grains can provide beneficial nutrients to the dairy cow diet and help in controlling purchased feed costs. Using these co-products in dairy cattle diets benefits society by decreasing the need to dispose of these by land filling, incineration, or composting. The dairy cow can use these co-product feeds to produce high quality animal proteins (milk, meat) for use in human diets.

Author

Dr. L. E. Chase

Professor Emeritus - Dairy Nutrition, Cornell University

lec7@cornell.edu

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