

Food Waste as Animal Feed: Wet Brewers and Wet Distillers Grains

Use on Dairy Farms

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.

Benefits of Using WBG and WDG in Dairy Rations

The use of WBG and WDG in dairy rations provides a source of protein, fiber, and energy to compliment nutrients provided from farm produced forages. The protein in these feeds is high in rumen undegradable protein (RUP) which provides amino acids directly in the small intestine. They are also low in soluble protein. The fiber in WBG and WDG is highly digestible. The energy value is 85 - 95% of corn grain. Typically, the price of WBG and WDG is less than the dollar value based on nutrient composition. This can help to lower the purchased feed cost when used in dairy diets. In some diets, the moisture in WBG and WDG can help in lowering feed sorting of the diet fed.

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. Recent work at the University of New Hampshire reported that mixing salt into WBG can delay mold growth. There are reports of microbial or acid-based preservatives that can be added to increase shelf life and decrease the onset of spoilage. Adding these preservatives adds cost and requires mixing equipment. Currently, the WBG and WDG available in New York do not contain any of these additives to retard spoilage. One on-farm practice that can help is to cover the feed with a plastic cover. 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.

A concern when storing wet feeds is the potential for runoff or leachate. This material has a high BOD and contains nutrients. If the leachate is not contained, there is potential for contamination of surface or ground water. Storing the feed in a 3 walled concrete structure is suggested. A system to collect and contain leachate may be needed. The storage system design needs to be evaluated on each farm. Some farms may have two storage facilities. One is used for feeding and the other for storage of a new load.

Benefits to Society

Using co-product feeds, like WBG and WDG, in animal diets decreases the need to dispose of these by composting, incineration or land filling. Work at Cornell has reported that less carbon dioxide is released to the environment when co-products are fed to animals than when they are incinerated. Selling these as an animal feed also lowers the disposal cost of these products by the beer or ethanol producing plants. If not sold as animal feed, the price of beer or ethanol would need to increase to cover the higher disposal cost of WBG and WDG. A second benefit is converting the human inedible protein in these feeds to a high-quality edible protein (meat, milk) for use in human diets. WBG and WDG are not directly usable by humans, but dairy cows, and other ruminants, have the unique ability to utilize a wide range of forages and feeds in their diets.

Constraints to Implementation

A key factor is the distance between the plant producing WBG and WDG and the

farm. The trucking cost of transporting high moisture feeds limits the distance they can be hauled before the cost exceeds the nutrient value cost. Using these feeds in smaller herds can be a concern since daily feed use may not be fast enough to prevent spoilage. The high phosphorus levels in WBG and WDG may limit the amount that can be incorporated into diets when considering nutrient management planning. Wet diets (> 55% moisture) may decrease palatability and feed intake. In diets with high level of wet silages, the inclusion level of WBG and WDG may need to be limited.

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.

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This material is based upon work that is supported by the New York State Department of Environmental Conservation.