

# Effectiveness of Mixing Wet Distillers' Grains and Hay with a Mixer Wagon or a Front End Loader for Long Term Storage

## A. S. Leaflet R2414

Dan Loy, professor of animal science; Daryl Strohhenn, professor of animal science; Joe Sellers, extension beef field specialist; Dan Morriral, professor of animal science

### Summary and Implications

Long term storage of wet distillers' grains is important in order for small beef producers to effectively utilize these feeds due to their short shelf life. Many smaller beef producers do not have access to mixing equipment to produce mixtures of wet distillers' grains and forages. This study measured the variation in feed mixtures mixed with a mixer wagon or a front end loader. Variation was reduced by approximately one half by mixing though a mixer wagon. Using the front end loader to mix the feeds resulted in variation that would be considered acceptable for many production situations

### Introduction

Storage of wet distillers' grains is a major challenge for small beef producers. Methods that incorporate forages to improve the mixing characteristics and moisture content for storage often require specialized equipment. This study evaluated the differences in variation when wet distillers' grains and ground hay were mixed by utilizing a mixer wagon or end loader.

### Materials and Methods

Two separate storage studies were conducted in 2007-2008 that used a combination of 80% wet distillers grains and 20% tub ground fescue hay on an as fed basis. These

studies were conducted at the ISU Beef Nutrition Farm (A.S. Leaflet R2412) and the ISU McNay Research Farm (A.S. Leaflet R2410). In the Beef Nutrition Farm study the combination was mixed in a feeder wagon, delivered to a concrete bunker silo, packed with a tractor and covered with plastic before being fed to growing beef calves in a backgrounding study. The study at the McNay Research Farm utilized a temporary bunker silo lined with big round hay bales covered in plastic. In this study, the hay and wet distillers' grains were mixed by layering approximately 1/3 of the hay required for a semi load at the bottom of the bunker. After unloading the truck, additional hay was added to the feed, using the front end loader and the tractor wheels to mix the combination of hay and wet distillers grains. Approximately one hour of mixing and packing for each semi load was required. This method was evaluated as an option for small producers that do not have access to feed mixing equipment. Feed samples from each storage structure were collected approximately every 2 weeks during the feed out. Standard forage analyses were conducted and a coefficient of variation calculated to evaluate the effectiveness of feed mixing.

### Results and Discussion

Results of feed analysis are shown in Table 1. Mixing with the feeder wagon reduced the variation by approximately half in dry matter and crude protein. Variation in fiber was low with both mixing methods. The variation that existed with the feed mixed by the loader would be considered acceptable for many production and feeding situations.

**Table 1. Variation of wet distillers' grains—grass hay in bunker silos, mixed with a loader tractor or feed mixer.**

	Mixed with Loader (McNay Study) <sup>1</sup>		Mixed with Mixer Wagon (Beef Nutrition Study) <sup>2</sup>	
	Mean	C.V	Mean	C.V
Dry Matter	42.7	7.1	41.0	4.4
Protein, % of dry matter	23.4	10.2	23.6	3.3
Neutral detergent fiber, % of dry matter	41.2	3.6	39.1	6.5

<sup>1</sup>Seven samples

<sup>2</sup>Six samples