

Mixing Roughages with Wet Corn Distillers Grains

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Corn distillers grains is an excellent supplement for livestock diets, especially for ruminants due to its crude protein (CP) concentrations between 20-35% with half of that being readily degradable and the other half considered undegradable or bypass protein. The total digestible nutrients (TDN) range from 70-110% depending on how much of the product is dried and if the solubles are added. The form of the co-product that ethanol plants produce varies greatly depending on production and marketing goals of a particular plant. Some plants produce wet distillers grains (WDG) which do not have the drying cost that a drier co-product would incur. This co-product is usually cheaper than some form of dried distillers grains, but since it includes more water, it is more expensive to transport long distances.

Producers close to plants producing WDG may find this to be a very appealing feed ingredient to use, however it does come with storage issues. If used fresh, it should be used within a few days in the summer or within a week in the winter otherwise spoilage can become a significant problem. Typically, WDG is delivered in semi-load quantities. For large operations it is likely that it can be fed to livestock before it spoils. However, for smaller sized operations, the size of delivered quantity would need to be stored to prevent spoilage.

Since WDG consists of very fine particles and is low in DM, extra care must be taken when ensiling it into a silo bag so as not to overfill and cause the bag to break (Figure 1). The high water content and small particle size tends to flatten out, does not stack well (Figure 2), and thus puts tremendous outward pressure on the sides of the bag. These same properties make it difficult to ensile in a bunker because it does not pack well. To solve this problem, mixing dry roughages with the WDG will increase the DM and particle size so that the physical properties of such a mixture allow it to stack upon itself. This reduces the natural outward pressure so that the silo bag will not tear. It also can be driven on by a loader tractor to pack and fill a bunker properly. In addition, roughages are typically lower in CP, TDN, fat and minerals, and make an excellent complement to the higher quality WDG.

Many types of dry roughage could be used to mix with WDG and ensiled. Particle size of the roughage needs to be small enough so that air can be excluded during the ensiling process. Therefore, some type of grinding of hay or crop residues would be necessary before blending it with WDG (Figure 3). In addition, the DM content of the blended mixture should not exceed 50%. Drier mixtures will not compact as well to ensure an anaerobic environment during the ensiling process. Another advantage of blending WDG with other roughages is the low pH of WDG aids in the preserving process. Ensiled WDG by themselves have a very low pH, approximately 3.0. When researchers in the SDSU Dairy Science Department mixed soy hulls in 70:30 roughage to WDG ratio, pH was approximately 4.0. Wet distillers grains can even improve the quality of the ensiling process of traditional silages. For example, researchers at the SDSU Dairy Science Department blended corn silage with WDG in 50:50 and 75:25 corn silage to WDG ratios on an as-fed basis and showed increased anaerobic stability upon exposure to air (Figure 3).

Any mixing method that does an adequate job is acceptable. Some producers use feed mixing wagons or manure spreaders (Figure 4). Once mixed, it can be put in a silo bag or bunker and covered with plastic. Another advantage to mixing WDG with roughages is that it is easier to break apart and feed in the winter when frozen compared to 100% WDG.

In summary, WDG makes an excellent feed supplement. It is easier to store and handle when mixed with roughages. DM should not exceed 50% when blending with other crop residues or hay to ensure proper fermentation when ensiling in a silo bag or bunker. Grinding roughage into small particles will ensure proper mixing, packing, and removal of air when storing. Common mixing equipment will do an adequate job of blending WDG with other roughages.

Figures 1-4. (Clockwise, starting with upper left)

