Forage Research Updates

SOUTH DAKOTA

Wet distillers grains ensiled with corn silage improves aerobic stability at feed-out

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Recent research at SDSU has focused on combining the increasingly available wet distillers grains (WDG) with corn silage in an attempt to improve the preservation of both feeds. Aerobic deterioration can make it difficult to preserve WDG because oxygen enhances yeast growth during storage, which is responsible for heating. However, WDG preserved in a silo bag can be difficult to handle during the cold winter months as it may freeze. Blending both feeds resulted in increased aerobic stability as well as easier removal during winter due to longer particle size contributed by corn silage.

In the SDSU experiments, corn silage and WDG were ensiled together at 75:25 and 50:50 ratios by weight. The initial pH of the blends was 4.6 and 4.0 for the 75 and 50% corn silage blends, respectively. This was attributed to the low initial pH (3.1) of the WDG when it came from the ethanol plant rather than by the fermentation process. Aerobic stability was measured as the number of hours before the temperature of the feed increased 4°F above ambient temperature. By day 14 in the silo-bag, acetic acid concentration in both blends exceeded 3% of DM. By day 129, the acetic acid concentration on the 75% corn silage blend reached 5.7 %, a value similar to that observed by University of Delaware researchers in *Lactobacillus buchneri* bacteria-inoculated, high acetic acid silages.

Low pH of corn silage-WDG blends observed by day 3 of ensiling suggests that preservation can be achieved even when corn silage is included at 75% of the blend. Low pH and high acetic acid concentration suggest that fermentation and aerobic stability are enhanced by combining corn silage with WDG. The blend not only eases the removal of stored WDG during the cold winter months, but also increases the aerobic stability of the corn silage once the silo is opened.

Table 1. Chemical composition of blends of corn silage with wet distillers grains (WDG) after 129 days in the silo.

	Corn Silage to WDG Ratio		
Parameter	**100:0**	**75:25**	**50:50**
Ph	3.7	4.0	3.9
DM	37.6	28.6	30.0
CP (% DM)	10.6	16.7	23.6
NDF (% DM)	45.5	45.3	43.1
ADF (% DM)	27.3	24.0	20.9
Aerobic stability (hours)	42	312	648