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The Effects of Supplementing Wet Distillers Grains Mixed With Wheat Straw to Growing Steers

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Procedure

Ninety-three crossbred steer calves (590 ± 31 lb) were stratified by weight and assigned randomly to one of three supplemental treatments to evaluate performance between different types of distillers grains. Treatments included DDGS, WDGS, and a mix that was 67% WDGS and 33% ground wheat straw (MIX) stored in silo bags for 30 days prior to initiation of the trial. Within each treatment steers were fed one of four levels of supplement: 0, 2, 4, or 6 lb of distillers grains/ head daily adjusted to changes in BW using percentage of BW fed (0%, .33%, .67%, and 1.0 % respectively) and one-day interim weights every 28 days. For cattle on the MIX, supplement was fed to allow cattle to consume the assigned level of distillers grains. For example, the 2 lb level of MIX received 2 lb of WDGS and 1 lb of wheat straw equaling 3 lb of supplement (DM-basis). Distillers grains were fed on top of the base diet to encourage total consumption of the supplement. The base diet consisted of 60% sorghum silage and 40% alfalfa hay and was used to simulate a similar response in performance that one would typically expect from steers in a grazing phase of production.

Steers were individually fed for 84 days using Calan electronic gates. Steers were limit fed a mix of 47.5% alfalfa hay, 47.5% wet corn gluten feed, and 5.0% supplement for 5 days prior to and for 5 days following the conclusion of the feeding period to reduce variation due to gut fills. After limit feeding cattle were weighed three consecutive days prior to trial initiation and following the end of the feeding period. The average of the three-day weights were used as the initial and final BW. Individual weigh backs were collected weekly and a sample of refused feed was taken and DM was determined using a 60°C

forced air oven. Bunks were evaluated daily, and necessary adjustments made to the base diet accordingly. NDF analysis was performed on the supplement ingredients fed using the Ankom procedure. Percentage NDF was 77.9% for wheat straw and 43.8% for WDGS. The MIX had an NDF content of 55%. DDGS was 34.5% NDF and the WDGS that was supplemented alone was 48% NDF.

Results

Type of Supplementation

There were no type*level interactions. No difference between supplementation type for initial BW ($P = 0.14$), ADG ($P = 0.20$), or F:G ($P = 0.32$) existed. Final BW for cattle supplemented with DDGS and WDGS were similar ($P = 0.81$). However, cattle supplemented with WDGS and DDGS had heavier final BW compared to MIX ($P = 0.05$), suggesting the MIX fed cattle gained at a slower rate. Dry matter intake was similar for cattle supplemented with DDGS and WDGS ($P = 0.15$). Cattle supplemented with MIX had lower DMI when compared to DDGS and WDGS ($P = 0.05$).

Level of Supplementation

There were no significant differences for initial BW ($P = 0.78$) when comparing levels of supplementation. Final BW ($P < 0.01$) exhibited a linear increase of 90 lb from the 0 lb level of supplementation to the 6 lb level of supplementation. Additionally, ADG ($P < 0.01$) increased linearly with the 0 lb level of supplementation gaining 1.53 lb/day and the 6 lb level of supplementation gaining 2.62 lb/day. Gain efficiency improved linearly ($P < 0.01$) with increasing levels of distillers grains supplementation. There was a quadratic effect for DMI

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Summary:

A growing study compared feeding wet distillers grains, dried distillers grains, and a mix of 66% wet distillers grains and 33% wheat straw as supplements to a forage-based diet. Steers were supplemented 0, 2, 4, or 6 lb distillers grains/ head daily. Wet distillers grains and dried distillers grains produced higher final body weight and dry matter intake compared to the mix. Increasing levels of distillers grains increased performance in forage based diets and wet grains mixed with straw reduced forage intake.

Introduction

Supplementing DDGS in forage based diets decreases forage DMI and increases ADG (2006 Nebraska Beef Report, pp. 30-32). Increasing ADG and decreasing DMI allows producers the opportunity to increase carrying capacity of pastures without needing to acquire additional land. When we attempted to decrease Sandhills Range intake by supplementing with DDGS, the reduction in intake was small and the yearlings gained more rapidly (2008 Nebraska Beef Cattle Report, pp. 28-30). Yearlings and cows are limited in intake by “fill” which is characterized by fiber (NDF). WDGS can be mixed at various levels with different types of forages, packed, and stored with minimal to no spoilage. Therefore, the objective of this study was to determine if forage DMI can be reduced by feeding WDGS mixed with low quality forage, and to determine the differences in performance between WDGS and DDGS.

Table 1. Level of distillers dry and wet grains on calf performance.

Item	DDG			WDGS			MIX			SEM	
	0	2	4	6	2	4	6	2	4		6
Initial BW, lb	588	599	605	590	578	604	592	586	579	586	10
Final BW, lb	722	795	805	829	772	810	800	743	773	807	16
ADG, lb/day	1.58	2.31	2.36	2.81	2.29	2.42	2.45	1.84	2.28	2.6	.15
DMI, lb/day	13.6	16.36	17.33	17.04	15.49	15.89	14.71	15.07	15.18	14.24	.61
Supplement	—	2.08	4.24	6.29	1.98	4.27	6.21	2.00	4.10	6.18	.11
Forage	13.6	14.28	13.09	10.75	13.51	11.62	8.50	12.07	9.03	4.98	.54
Straw	—	—	—	—	—	—	—	1.00	2.05	3.08	—
F:G	7.23	7.05	7.28	6.03	6.70	6.55	5.94	8.06	6.57	5.40	.27

($P < 0.01$) between levels of supplementation with cattle supplemented 4 lb/head daily consuming the most feed (16.1 lb DMI) and cattle supplemented 0 lb/head daily consuming the least amount of feed (13.6 lb DMI) (Figure 1).

There were no differences in performance between DDGS and WDGS. Mixing WDGS with wheat straw did decrease DMI without affecting F:G. Additionally, increasing the level of distillers grain supplemented increased final BW and improved animal performance relative to ADG and F:G.

Using the MIX could be a way to decrease grass consumption in grazing cattle production, because of the lower intakes experienced in this trial and because grazing animals consume to a physical fill. At the highest feeding level each lb of DDGS replaced 0.5 lb of forage and each lb of WDGS replaced 0.8 lb of forage. When the MIX was fed, each lb of the MIX replaced 0.9 lb of forage. If we assume the WDGS in the MIX replaced 0.8

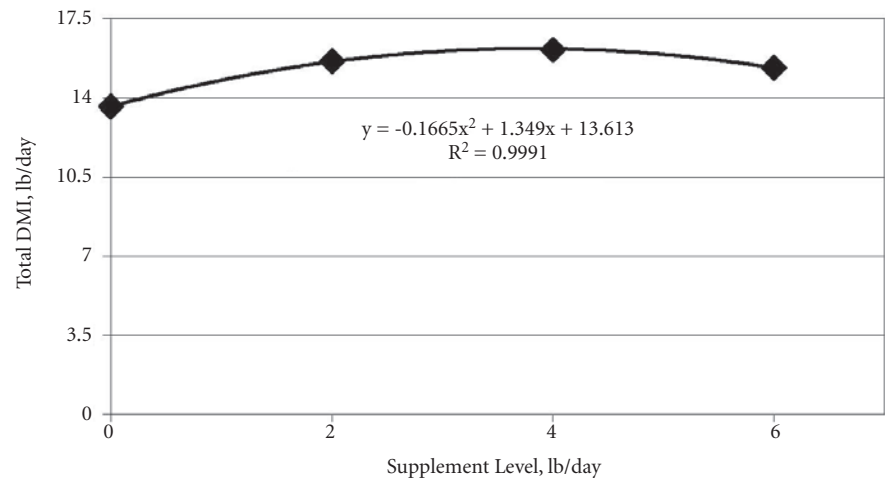


Figure 1. Depiction of DMI relative to pounds of distillers grains supplemented.

lb of forage, then each lb of straw replaced 1.6 lb of forage. The 1.6 lb of forage would contain about 0.9 lb fiber (NDF) and the 1 lb of straw about .8 lb of NDF. This suggests that NDF in the straw supplied the fill to limit forage intake.

These data suggest that mixes of WDGS and straw from 33% to 50%

straw will store, be palatable, and will reduce intake of forage of quality equivalent to grazed forage.

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