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Introduction

Distillers grains are an excellent energy and protein feed source for beef cattle. Corn distillers grains have been fed to beef cattle for many years, but sorghum distillers grains are becoming more popular and may be more cost effective than corn. Sorghum is very comparable to corn in terms of energy, but has a higher crude protein value. All distillers grains are available in a wet and dry form. The moist texture of wet distillers grains can help to reduce sorting at the bunk and appears to improve intake in young calves. The objective of this study was to evaluate the effect of corn and sorghum wet distillers grains on performance and digestibility of receiving stocker calves.

Key words: corn wet distillers grains, sorghum wet distillers grain, receiving stocker cattle

Experimental Procedures

Crossbred steers ($n = 263$, 644 lb initial body weight) were obtained from a single source in central Texas. Steers were organized in a generalized randomized complete block design, blocked by truck ($n = 4$), and stratified by weight within block. Steers were assigned to one of four treatments: 1) cracked corn with wet corn distillers grains; 2) cracked corn with wet sorghum distillers grains; 3) rolled sorghum with corn wet distillers grains; or 4) rolled sorghum with sorghum wet distillers grains. This procedure had 24 pens of equal size and used 6 pens per treatment. Upon arrival, calves were weighed, tagged, and allowed to rest overnight with free-choice access to brome hay and water. The day after arrival all calves were dewormed and vaccinated for respiratory and clostridial diseases. Calves received Dectomax (Zoetis, Florham, NJ), Excede (Zoetis, Florham, NJ), and Vision 8 with SRUR (Merck Animal Health, Duluth, GA). On day 7, steers were administered a modified-live vaccine, Bovi-Shield Gold (Zoetis, Kalamazoo, MI) for protection against infectious bovine rhinotracheitis. On day 21, steers were revaccinated against respiratory disease with Pyramid 5 (Boehringer Ingelheim, St. Joseph, MO).

Diets (Table 1) were mixed and fed daily for a total of 90 days. Steers were fed a common diet consisting of wet corn gluten feed, cracked corn, alfalfa hay, grass hay, and

supplement from days 83 to 90 to equalize gut fill. The amount of feed delivered to each pen was recorded daily and total mixed feed samples were collected weekly. Steers were weighed on days 0 (initial processing), 21, 40, 83, and 90. Steer health was monitored daily. If body temperature was between 103°F and 104.5°F and the steer had visual signs of suffering from a respiratory disease, the animal was administered Bio-Mycin 200 (Boehringer Ingelheim Vetmedica, Inc. St. Joseph, MO) per label instructions. If the body temperature exceeded 104.5°F, the animal was administered Resflor Gold (Intervet Inc. Roseland, NJ) per label instructions.

Results and Discussion

Overall, there were no differences in diet consumption across treatments ($P \geq 0.25$; Table 2). From days 0 to 83, average daily gain was not different for corn vs. sorghum wet distillers grains ($P \geq 0.10$) or for corn vs. sorghum grain ($P \geq 0.35$). In terms of feed efficiency, all steers converted feed similarly regardless of treatment ($P \geq 0.22$). Corn and sorghum wet distillers grains appear to be similar in the nutrients allocated to the growth of the animal. There were differences observed on days 83 to 90 among grain type or wet distillers grain type. However, during this period a common diet was fed to the steers to equalize gut fill and the results from this week are not comparable to the period the steers were on the treatment diets.

Implications

Sorghum wet distillers grains can be fed at the same level as wet corn distillers grains to growing stocker steers and will produce similar responses in terms of gain, intake, and efficiency. The slight differences observed in the digestibility study did not affect the performance of the steers. Overall, sorghum wet distillers grains are a viable alternative to wet corn distillers grains to feed cattle in the receiving and growing yard.

Table 1. Composition of diets and distillers grains fed

Item	Cracked corn		Rolled sorghum		Wet corn distillers grain	Wet sorghum distillers grain
	Wet corn distillers grain	Wet sorghum distillers grain	Wet corn distillers grain	Wet sorghum distillers grain		
Ingredient, % dry matter						
Corn	25.36	25.36	0	0		
Sorghum	0	0	25.36	25.36		
Corn wet distillers grains	30.00	0	30.00	0		
Sorghum wet distillers grains	0	30.00	0	30.00		
Alfalfa hay	17.50	17.50	17.50	17.50		
Prairie hay	17.50	17.50	17.50	17.50		
Supplement ¹	9.64	9.64	9.64	9.64		
Composition, % dry matter						
Dry matter, %	95.7	95.1	95.7	95.6	93.5	89.3
Ash	11.4	9.6	11.0	9.6	23.4	6.8
Neutral detergent fiber	40.8	34.0	36.4	34.5	36.1	34.6
Acid detergent fiber	19.8	17.0	17.3	18.0	10.9	16.8
Crude protein	19.0	20.0	19.3	19.6	29.7	33.1
Starch	12.5	12.9	12.0	14.4	2.5	4.3
Fat	5.5	5.4	5.5	5.1	11.7	11.0
Calcium	0.92	0.97	0.92	0.91	0.01	0.08
Phosphorus	0.90	0.89	0.92	0.90	1.07	0.94

¹Supplement ingredients: Monensin 220mg/kg, processed grain by-products, calcium carbonate, magnesium, mica, salt, zinc sulfate, sodium selenite, copper sulfate, manganous oxide, manganese sulfate, ferrous sulfate, zinc oxide, thiamine mononitrate, vitamin E supplement, vitamin A supplement, ethylenediamine dihydroiodide, vitamin D3 supplement, cobalt carbonate, ferrous carbonate, and calcium iodate; manufactured by Cargill Animal Nutrition, Minneapolis, MN.

Table 2. Effects of wet corn or sorghum distillers grains with corn or sorghum grain on gain, intake, and efficiency in crossbred Angus steers

Item	Cracked corn		Rolled sorghum		SEM ¹	P-value		
	Wet corn distillers grain	Wet sorghum distillers grain	Wet corn distillers grain	Wet sorghum distillers grain		Grain	Wet distillers grain type	Grain × Wet distillers grain type
Number of pens	6	6	6	6				
Number of animals ²	66	66	66	66				
Days on feed	90	90	90	90				
Initial body weight, lb	651	640	640	645	7.02			
Final body weight, lb	955	957	946	959	6.16			
Dry matter intake, lb/day								
days 0 to 21	17.80	17.62	17.58	17.67	0.59	0.88	0.94	0.82
days 21 to 40	25.61	26.69	25.83	26.91	0.92	0.81	0.25	0.99
days 40 to 83	33.11	31.57	32.54	32.14	1.52	0.99	0.47	0.67
days 83 to 90 ²	24.35	25.54	23.94	26.95	1.32	0.65	0.06	0.4
days 0 to 90	27.57	26.77	27.02	27.30	1.08	0.99	0.79	0.57
Average daily gain, lb								
days 0 to 21	3.56	3.87	3.96	3.67	0.24	0.68	0.95	0.23
days 21 to 40	4.33	4.44	4.31	4.51	0.20	0.95	0.46	0.82
days 40 to 83	3.39	3.21	3.28	3.15	0.11	0.35	0.1	0.82
days 83 to 90 ³	0.18 ^a	0.99 ^a	0.79 ^a	2.27 ^b	0.40	0.03	0.01	0.43
days 0 to 90	3.37	3.45	3.48	3.48	0.07	0.37	0.49	0.69
Gain:Feed								
days 0 to 21	0.20	0.22	0.23	0.21	0.01	0.72	0.93	0.22
days 21 to 40	0.17	0.17	0.17	0.17	0.01	0.8	0.83	0.74
days 40 to 83	0.10	0.1	0.1	0.1	0.01	0.32	0.38	0.84
days 83 to 90 ³	0.01 ^a	0.04 ^a	0.03 ^a	0.08 ^b	0.02	0.03	0.02	0.56
days 0 to 90	0.12	0.13	0.13	0.13	0.01	0.59	0.64	0.48

^{a,b,c,d} Within a row least squares means without a common superscript differ ($P \leq 0.05$).

¹ SEM = standard error of the mean.

² For treatment corn grain/ corn wet distillers grains initial n = 66, final n = 65: steer died from breaking leg in chute.

³ Days 83-90 steers were fed a common diet to equalize gut fill of 28.5% corn grain, 30% wet corn gluten feed, 17.5% alfalfa, 17.5% brome grass hay, and 6.43% supplement, dry matter basis.