

# Distillers Grains Equalizes Steer Performance and Carcass Traits in Finishing Diets with Reciprocal Levels of Corn and Barley

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## Introduction

It is possible to feed more calves to market weight in North Dakota with the extensive feed resources available and the proximity of terminal markets. Corn is available from increasing acres for feeding or ethanol production. Barley has consistently been undervalued as feed grain. Feeding distillers grain (DG) at 24 percent or more in barley based diets proved highly productive. Combining corn and barley with distillers grain may provide an economical and safe feed base. This study compared reciprocal levels of corn and barley with constant DG in beef growing and finishing diets. Feedlot performance (feed intake, gain, feed efficiency), and carcass traits were determined with relative value of corn and barley calculated.

## Procedures

Steer calves from the Central Dakota Feeder Calf Club were allotted to 16 different pens, 10 head per pen, with four treatments and four replicates per treatment. The treatments were reciprocal combinations of corn and barley (0, 33, 67, and 100%) as the grain component of the totally-mixed growing (~55 Mcal/lb NEg) and finishing diets (~62 Mcal/lb NEg). Distillers grain was included at about 25 percent of the diet dry matter in all rations. Calves were fed ad libitum in respective pens and individually weighed every 28 days. Feed intake, gain, and feed efficiency were calculated for the 2-month growing and 5-month finishing phases. Steers were slaughtered at Tyson Meats, Dakota City, NE, when approximately 60 percent would grade USDA Choice by visual appraisal. Carcass traits were determined after a 24-hour chill by qualified graders according to USDA criteria. Data was summarized and statistically analyzed using SAS Mixed procedures.

**Table 1. Rations for calves fed reciprocal levels of barley and corn.**

		Diet Treatments			
	% Barley	0	33	67	100
	% Corn	100	67	33	0
Percent, DM basis					
Growing diets					
Barley, dry rolled	0.34	12.66	24.65	36.76	
Corn, dry rolled	36.18	24.01	12.20	0.35	
Distillers grain, modified	25.84	25.71	25.59	25.50	
Corn silage	12.94	12.86	12.79	12.73	
Hay, chopped	22.52	22.45	22.35	22.23	
Suppl. Ion, Min, Vit	2.18	2.30	2.42	2.43	
Finishing diets					
Barley, dry rolled	0.00	19.32	38.01	56.80	
Corn, dry rolled	55.95	36.97	18.56	24.24	
Distillers grain, modified	24.73	24.54	24.37	24.24	
Corn silage	8.76	8.70	8.56	8.54	
Hay, chopped	8.42	8.29	8.24	8.18	
Suppl. Ion, Min, Vit	2.14	2.19	2.25	2.24	

## Results

Steers performed similarly on all treatments in the feedlot and carcass traits were minimally different. Feed intake tended to decrease with increasing barley but gains were constant. Feed efficiency improved with increasing barley levels over the entire feeding period. There were no health issues or digestive problems with any of the rations. The relative value of a bushel of barley was calculated as

a percent of the value of a bushel of corn based on equal feed cost per pound of gain (Table 4). The relative value of barley is 104 percent of corn for growing diets, 92 percent of corn for finishing diets and 95 percent of the bushel price of corn over the entire feeding period. If barley can be purchased for less than these relative prices for respective feeding phases, feeders may increase profit from using barley in their feedlot diets with 25 percent distillers grain in the ration.



**Crossbred steers on reciprocal corn-barley finishing trial, winter 2011-12.**

**Table 2. Performance of steers fed reciprocal levels of corn and barley with distillers grain.**

	Diet Treatments				Std Err	P Value
	% Barley % Corn	0 100	33 67	67 33	100 0	
No. head		32	32	30	32	
No pens		4	4	4	4	
Live Wt, lbs						
Initial Wt, Oct 25		616	614	613	615	7.86 0.98
d 190, Final wt.		1436	1415	1433	1422	21.52 0.75
Dry matter intake, lb/hd/d						
Growing d 1-56		22.73	21.41	20.39	20.36	0.92 0.09
Finishing d 57-190		25.24	24.75	24.62	24.16	0.54 0.25
Overall d 1-190		24.50	23.76	23.37	23.04	0.63 0.15
Average daily gain, lb						
Growing d 1-56		4.63	4.44	4.49	4.50	0.19 0.48
Finishing d 57-190		4.22	4.14	4.16	4.19	0.19 0.51
Overall d 1-190		4.39	4.26	4.51	4.09	0.26 0.42
Feed efficiency, DM/lb gain						
Growing d 1-56		4.91	4.82	4.55	4.53	0.12 0.04
Finishing d 57-190		6.01	5.96	5.76	5.79	0.12 0.22
Overall d 1-190		5.66	5.61	5.39	5.39	0.10 0.04

**Table 3. Carcass characteristics of steers fed reciprocal levels of corn and barley with distillers grain.**

	Diet Treatments				Std Err	P Value
	% Barley % Corn	0 100	33 67	67 33	100 0	
Hot carcass wt, lbs		868	855	865	864	13.95
Dressing percent		62.97	62.99	62.87	63.23	0.4
Rib eye area, sq. in.		14.80	14.77	14.81	15.28	0.32
Fat thickness, 12th rib		0.56	0.58	0.58	0.44	0.06
Kidney, pelvic heart fat, %		2.50	2.48	2.53	2.44	0.06
Yield Grade		2.97	2.97	2.99	2.48	0.23
Marbling score		453	457	456	422	16.93
Percent USDA Choice		77	84	81	63	

**Table 4. Value of barley relative to corn based on equal feed costs per pound of gain when fed with distillers grain.**

	100 Corn 0 Bar	67 Corn 33 Bar	33 Corn 67 Bar	0 Corn 100 Bar	Avg of 3 diets with barley
Feeding Phase	Corn	Barley, as percent of corn, \$/bu			
Overall	100	92	99	95	95
Growing	100	99	110	103	104
Finishing	100	91	91	93	92

  

	100 Corn 0 Bar	67 Corn 33 Bar	33 Corn 67 Bar	0 Corn 100 Bar	Avg of 3 diets with barley
Feeding Phase	Corn, \$/bu	Barley, \$/bu			
Overall	7	6.44	6.93	6.55	6.64
Growing	7	6.93	7.7	7.21	7.28
Finishing	7	6.37	6.37	6.51	6.42