2016

Finishing Yearling Heifers Using Self- Fed Dried Distillers Grains on Pasture

Jared M. Mracek
University of Nebraska-Lincoln

Jason M. Warner
University of Nebraska-Lincoln

Bradley R. Wetovick
University of Nebraska-Lincoln

Dennis E. Bauer
University of Nebraska-Lincoln

Twig T. Marston
University of Nebraska-Lincoln

See next page for additional authors

Finishing Yearling Heifers Using Self-Fed Dried Distillers Grains on Pasture

Jared M. Mracek, Jason M. Warner, Bradley R. Wetovick, Dennis E. Bauer, Twig T. Marston, Jim C. MacDonald, Jerry Volesky and Rick J. Rasby

Summary

A 2-yr study compared a traditional system of grazing yearlings followed by a grain-based drylot finishing program to a system using a self-fed dried distillers grain supplement during a spring/summer/fall pasture grazing season. The self-fed (SF) heifers had greater ADG and ending BW on pasture but the traditionally managed heifers had greater final BW and HCW. At harvest, SF heifers had greater 12th rib back fat. When data were adjusted to a common empty body fat, carcass weight and marbling score were greater for traditionally managed heifers.

Introduction

Traditionally, producers select replacement heifers at weaning time. Selecting replacement heifers at weaning is based on weaning weight. Once heifers are selected as replacements, producers have management options for cull heifers. Non-selected heifers could be sold or retained into a yearling system where they graze pasture and are finished in a feedlot. With the availability of ethanol byproducts, an alternative heifer enterprise may be considered for the non-selected heifers. This experiment was conducted to determine the possibility of adding another enterprise to an existing cow/calf enterprise and establish another profit center to generate revenue. Distiller grains was selected as the feed used in the self-feeder because distiller grains are usually less expensive in the spring/summer compared to the fall/winter and distiller grains does not have a negative impact on forage digestibility. The objectives of the experiment were: 1) to compare heifer performance and carcass characteristics in two systems post-weaning, and 2) to assess the pasture use and conditions when heifers were either finished on vegetative pasture with a high energy supplement or allowed to graze summer pastures without supplementation followed by a feedlot finishing phase.

Procedure

The experiment was conducted at the University of Nebraska Barta Brothers Ranch located near Rose, NE. In a two year study, 96 crossbred yearling heifers were used: Control (CON) and Self-fed (SF) to compare a traditional yearling system of spring/summer grazing followed by a feedlot finishing period to a system where yearling heifer grazed spring/summer/fall pasture and were offered a high concentrate self-fed ration. In the spring each year, heifer calves were weighed, vaccinated for respiratory disease, implanted with Synovex-H (Pfizer Animal Health), and dewormed with Ivomec (Merial Animal Health). Once weighed, heifers were assigned randomly to treatments. All heifers had limited access to grass hay for three days before two day consecutive BW measurements were recorded and used to stratified heifers and randomly assigned them to treatments after the second weight was recorded (CON = 688 lb; SF = 677 lb). Control heifers (n = 24/yr) were provided a summer pasture with no supplement followed by a feedlot finishing period. Self-fed heifers (n = 24/yr) had ad libitum access to a dried distillers grains plus solubles (DDGS)-based concentrate that was offered in a self-feeder during the grazing season.

Both CON and SF heifers were placed on native upland Sandhills pastures of similar topography and forage composition. Control heifers had a stocking rate of 0.61 AUM/ac while SF heifers were stocked at 0.87 AUM/ac based on the assumption that the distiller grain supplement would replace one third of the grazed forage consumed. Each treatment grazed from mid-May to the end of their treatments respective grazing period. Forage stubble height was measured at the end of each grazing period.

All cattle were transported to a commercial abattoir (Tyson Fresh Meats, Dakota City, Nebraska) when 12th rib backfat was estimated to be 0.50 inches. Hot carcass weights, marbling scores, 12th rib fat depth, LM area, and KPH were recorded. Final live weight was estimated by dividing individual carcass weight by a 62% dressing percentage.

Control (Grazing Followed by Feedlot Phase)

Control heifers grazed from mid-May to mid-September annually and received a free choice mineral supplement (0.24 lb/hd/d). In September, heifers were weighed and transported to the Haskell Agricultural Laboratory (HAL) feedlot located near Concord, NE. Upon arrival heifers were vaccinated for respiratory disease, treated for internal and external parasites with Ivomec (Merial Animal Health), and re-implanted with Synovex-H (Pfizer Animal Health). Prior to collecting two day consecutive weights, cattle were limit fed grass hay for three days to minimize variation in gastrointestinal tract fill. Cattle were transitioned over a period of 21 days to a final finishing diet composed of 75.25% dry rolled corn, 18.0% corn silage, 3.5% liquid supplement, 3.25% SBM, on a DM basis.

Self-Fed (Ad libitum DDGS Based Feed during Grazing)

The SF heifers grazed from mid-May to mid-October and had ad libitum access to a dry distiller grains plus solubles (DDGS) based supplement (Table 1). Self-feeders were located near pasture water sources. This was done to reduce trampling of areas and minimize the effect of creating a blowout. The stocking rate was increased by one-third in anticipation that the DDGS would substitute for some of the grazed forage. Heifers were harvested on October 26 and October 16 for yr 1 and 2, respectively. Because 12th rib backfat

Table 1. Composition of concentrate mixture offered to Self-fed heifers

Ingredient[a]	Year1	Year 2
DDGS	75	75
Whole Shelled Corn	20	—
Soy Hull Pellet	—	20
Commercial Pellet[b]	5	5

[a]% of supplement DM basis. Supplement intake: 10.12 lb/hd/d/yr (DM basis).
[b]Contained minerals and ionophore (Bovatec).

Table 2. Performance and forage attribute of Control and Self-fed heifers

	Actual				Adjusted[a]			
Item	Control	Self-Fed	SEM	P-value	Control	Self-Fed	SEM	P-value
Initial BW, lb	688	677	19.81	0.33	688	677	19.81	0.33
Off Grass BW, lb	909	1220	21.21	0.01	909	1146	13.02	0.01
ADG	1.73	3.21	0.10	0.01	1.73	3.39	0.08	0.01
Days on Grass	128.5	169	6.75	0.01	128.5	138	8.14	0.17
Forage Appraisal, in	6.46	6.33	0.66	0.33	6.46	6.33	0.66	0.33
Days in Feedlot[b]	97.5	—	—	—	103	—	—	—

[a]Data adjusted to 28% empty body fat (Guiroy et al., 2001; Journal of Animal Science).
[b]Feedlot diet composition (DM-basis): 75% DRC, 18% corn silage, 3.5% liquid supplement, 3.25% SBM.

Table 3. Performance and carcass weight of Control and Self-fed heifers

	Actual				Adjusted[a]			
Item	Control	Self-Fed	SEM	P-value	Control	Self-Fed	SEM	P-value
HCW, lb	789	747	24.05	0.01	788	711	18.57	0.01
Final BW, lb	1256	1220	38.91	0.03	1271	1146	29.95	0.01
System ADG, lb[b]	2.53	3.21	0.21	0.01	2.52	3.39	0.09	0.01
Feedlot ADG, lb[c]	3.58	3.21	0.34	0.01	3.51	3.39	0.20	0.46
F:G Grass[d]	11.58	6.92	0.27	0.01	11.58	6.55	0.27	0.01
F:G Feedlot[e]	6.95	6.92	0.76	0.92	7.25	6.55	0.48	0.06

[a]Data adjusted to 28% empty body fat (Guiroy et al., 2001; Journal of Animal Science).
[b]Using days in system: (Control: May-December; Self-fed: May-October).
[c]Using days in system: (Control: September-December; Self-fed: May-October).
[d]Grass intake was determined using the 2000 NRC Nutrient Requirements for Beef Cattle.
[e]Feedlot DMI: 23.90 lb/d.

was significantly different from the control heifers at harvest (0.57 inches for SF and 0.42 inches for CON), performance and carcass data were adjusted using an equation to adjust data to a common empty body fat (EBF) of 28%.

Data were analyzed as a completely randomized design with the experimental unit being the pasture. Treatment was analyzed as a fixed effect and year was analyzed as a random variable.

Results

Performance

Heifer performance and days on grass or in the feedlot are presented in Table 2. The SF heifers had greater ADG while on pasture as a result of the treatment. Gain for SF heifers was 3.39 lb/d while CON heifer ADG was 1.73 lb/d during the pasture phase and 3.51 lb during the feedlot phase (2.52 lb/d; combined grazing and feedlot phases for CON heifers, Table 3). Self-fed heifers consumed on average 10.12 lb/hd/d/yr of the DDGS concentrate. There was no difference in forage appraisal between the two treatments. Self-fed heifers were harvested approximately 93 d before their CON contemporaries.

Carcass Data

Control heifers had greater F:G on grass (11.58 lb) and in the feedlot (7.25 lb) than SF heifers (6.55 lb and 6.55 lb respectively). The CON heifers produced heavier carcasses than SF heifers (788 lb vs 711 lb). A greater hot carcass weight for CON heifers resulted in final calculated live weight being greater than SF heifers (1271 lb, 1146 lb respectively; Table 3). After carcass data were adjusted to a 28% empty body fat, there were differences ($P \leq 0.01$) in USDA marbling scores, calculated yield grade, and LM area (Table 4). Control heifers had higher marbling score and had a lower calculated yield grade then SF heifers (2.85 vs 3.11 respectively). Heifers on the control treatment had larger LM area compared to SF heifers.

This experiment was conducted to determine the possibility of adding another enterprise to an existing cow/calf enterprise and establish another profit center to generate revenue. Distiller grains was selected

Table 4. Carcass characteristics of Control and Self-fed heifers while grazing pasture

	Actual				Adjusted[a]			
Item	Control	Self-Fed	SEM	P-value	Control	Self-Fed	SEM	P-value
% EBF[b]	27	29	0.34	0.01	28	28	—	—
Marbling Score[c]	457	431	9.02	0.06	464	387	9.16	0.01
YG	2.80	3.36	0.15	0.01	2.85	3.11	0.11	0.01
12th Rib Backfat, in	0.42	0.57	0.41	0.01	0.43	0.50	0.03	0.06
LM Area, in	13.03	12.21	0.24	0.01	13.14	11.60	0.33	0.01

[a]Data adjusted to a 28% empty body fat (Guiroy et al. 2001; Journal of Animal Science).
[b]Original EBF %: (Control 27.26; Self-fed: 29.01).
[c]Marbling Score 500 = Modest (Choice), 400 = Small (Choice), 300 = Slight (Select).

as the feed used in the self-feeder because distiller grains are usually less expensive in the spring/summer compared to the fall/winter and distiller grains does not have a negative impact on forage digestibility.

Jared M. Mracek and Jason M. Warner, graduate students

Bradley R. Wetovick undergraduate student

Dennis E. Bauer, extension educator, Ainsworth, NE

Twig T. Marston, former director, Northeast Research and Extension Center, Norfolk, NE

Jim C. MacDonald associate professor University of Nebraska Animal Science Department

Jerry Volesky, professor West Central research and Extension Center, North Platte, NE

Rick J. Rasby, professor, University of Nebraska–Lincoln Department of Animal Science, Lincoln NE