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BEEF SYSTEM METHODS IMPACT BACKGROUNDING AND FINISHING NET RETURNS

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Abstract: Cow-calf pairs, grazing native range, from the NDSU-Dickinson RE Center and the SDSU-West River Ag Center (n = 159) were used to evaluate weaning date and backgrounding method. Treatments were: 1) Normal Wean (Jun-Nov) - feedlot direct (NW-FLT), 2) Early Wean (Aug) – feedlot direct (EW-FLT), 3) Early Wean (Aug) - grazed dryland unharvested corn (Aug-Nov) - feedlot (EW-CN), and 4) Normal wean (Nov) - grazed dryland unharvested corn (Nov-Dec) - feedlot (NW-CN). Feedlot arrival date for finishing at the UNL-Panhandle RE Center feedlot, Scottsbluff, NE was staggered. Harvest end point was based on ultrasound BF depth. Mean differences were determined using the SAS MIXED procedure. For backgrounding, EW-CN and EW-FLT steer growth was similar and more rapid [(Gain: (P = 0.043) and ADG: (P = 0.004)] than NW-FLT and NW-CN. The EW-CN system COG of $1.05/kg was lowest when compared to $1.31, $3.77, and $1.37/kg for the NW-FLT, NW-CN, and EW-FLT, respectively. Stockpiling corn resulted in excessive crop shrink (P = 0.013) reducing days of grazing by 70%. Backgrounding net returns/steer were $87.50, -$33.38, $104.58, and $69.56 for the NW-FLT, NW-CN, EW-CN and EW-FLT, respectively. For finishing, EW-FLT steers grew slower (P = 0.0011), consumed less DM/d (P = 0.0001), were more efficient (P = 0.008), and COG was lower (P = 0.0002). Carcass closeout values for HCW, FD, dressing %, and YG did not differ; however, EW-FLT steer carcasses had smaller REA (P = 0.053), greater marbling score (P = 0.0005), and numerically greater % Choice quality grade (P = 0.11). EW-FLT steers placed directly in the feedlot at weaning were associated with lower placement cost, more DOF (P = 0.0001), and higher feed and yardage costs. Net return to finishing of $39.62 per head for the EW-FLT was greater, when compared to $3.11, -$84.06, and $0.16 for the NW-FLT, NW-CN, and EW-CN, respectively. Experimental results suggest that greatest beef systems net return will be obtained when EW steers graze dryland unharvested corn and are sold at the end of backgrounding; however, when held through final harvest, early weaning and direct feedlot placement were associated with greatest net return.

Key Words: Beef Systems, Early Weaning, Corn Grazing

Introduction

Previous research has evaluated forage utilization by early (August - EW) vs normal (November - NW) weaned beef cows and the effect of weaning date on cow and calf performance. These studies show that weaning calves early has a positive impact on growth and efficiency during the backgrounding phase, improves cow body condition score, reduces range forage utilization, and shortens the lifetime feeding period of steers held for retained ownership (Landblom et al., 2006). Economic analysis of retained ownership concluded that early weaning improved feedlot production efficiency by reducing daily and per carcass revenue relative to normal weaning (Fausti et al., 2007). And subsequently, Landblom et al. (2008) documented that significantly altering weaning date can have a positive impact on business profitability in the beef cattle enterprise. The objective of this study was to evaluate the effect of weaning date (August vs November) and backgrounding method on backgrounding and finishing net returns.

Materials and Methods

Spring calving cows (Mar-Apr) originating at the South Dakota State University Antelope Station (ANT), Buffalo, SD, and the North Dakota State University Dickinson Research Extension Center (DREC), Manning, ND were used in a 2 x 2 factorial arrangement comparing weaning date (August vs November) and backgrounding method (feedlot vs grazing dryland unharvested corn). Pen or pasture served as the experimental unit and backgrounding, finishing, and carcass data were analyzed using the SAS MIXED procedure. The protocols used in this study were approved by the North Dakota State University Animal Care and Use Committee.

Steer calves in the EW system were weaned on August 15 and calves in the NW system were weaned the first week of November. At each weaning date, steers from each research facility were randomly assigned to either feedlot or corn grazing backgrounding treatments. Corn grazing steers were held in drylot and fed hay for two weeks before being put into replicated dryland unharvested corn fields. Early weaned steers began grazing unharvested corn on August 25th and the NW steers began grazing corn on November 21st. For the feedlot treatment, EW and NW steers were shipped by commercial truck to the University of Nebraska Panhandle Research Extension Center feedlot, Scottsbluff, Nebraska where they were finished and harvested at a commercial Abattoir. Steer weight and backfat depth of 12.7 mm were used to determine final harvest endpoint. Measurement for backfat depth was conducted 30 – 45 days before final harvest using a SonoVet ultrasound machine and 3.5 MHz probe. Final harvest date was determined by calculating the required number of DOF to attain 12.7 mm BF.

Systems measurements were: corn forage nutrient change, corn forage utilization, backgrounding performance type and economics, treatment effect on animal health, corn grazing grain equivalent value, finishing performance and economics, and carcass closeout values.

Steers in the systems investigation were vaccinated before spring turnout on native pasture and then were vaccinated 3-4 weeks before each weaning date, and again at weaning with modified live IBR, BVD types I and II, PI_3, BRSV + Mannhiema haemolytica, and an inactivated 7-way Clostridial vaccine + H. somunus. In addition, the calves were poured with a parasiticide. After weaning, the calves were observed closely for the onset of health problems and were treated according to the attending veterinarian's recommendation. The following information is being recorded: body temperature, number of pulls, product used for treatment and cost, percent death loss, and system cost due to death loss.

Results and Discussion

Systems Backgrounding **-** Considering the results of Fausti et al. (2007) in the previous study, the present investigation was conducted to compare calf growing methods for EW and NW calves after weaning that compared feedlot backgrounding with grazing unharvested dryland corn before finishing based on a high quality grid. Standing peak dryland corn forage nutrient quality was determined mid-September and tracked through to mid-January. Corn forage CP declined from Sep to Nov (9.16 to 8.66) and IVDMD declined from 75.2% to 57.0%.

Peak DM corn production for the EW steers averaged 2.0 MTon/acre and peak DM corn production for the NW group was 1.75 MTon/acre. Early weaned steers utilized an average 1.46 MTon/acre over the 70 day grazing period and NW steers utilized 0.37 MTon/acre. Field loss in stockpiled corn set aside for grazing after normal weaning was excessive averaging 0.82 MTon/acre. Compared to the EW treatment, the large field loss reduced available days of grazing by 70%.

Comparative systems backgrounding performance is shown in Table 1. Steer weight at EW did not differ (P=0.44), but gain among the NW-CN steers was reduced significantly (P=0.043) due to field crop shrink. Average daily gain for EW and NW steers was similar and greater (p=0.004) than the control steers despite significant crop shrinkage. System backgrounding economics are shown in Table 2 where gain value, input costs, net returns, and cost/kg of gain are summarized. The backgrounding cost/kg of gain was $$1.31, $3.77, $1.05, and $1.37 for the NW-FLT, NW-CN, EW-CN, and EW-FLT, respectively. Net return/steer among the steers in EW-CN system was 33.5% greater than the EW-FLT system and 16.3% greater than the NW-FLT system. Stockpiling corn for grazing after normal weaning was not successful resulting in a net loss/steer of -$33.38. The stocking rate for early weaned calves that graze unharvested dryland corn was calculated to be 0.1012 hectare/weaned calf/month and the stocking rate for stockpiled corn reserved for normal weaned calves in the study was determined to be 0.324 hectare/weaned calf/month.

The effect of alternative weaning date and corn grazing on finishing performance is shown in Table 3. Early weaning and corn grazing backgrounding resulted in staggered feedlot start weight (P = 0001), and a large variation in the number of days on feed (P = 0.0001); however, harvest age (P = 0.27) and 4% shrunk harvest weight (P = .409) did not differ. For gain and FE, EW-FLT steers gained at the slowest rate (P = 0.001), were more efficient (P = 0.008), and feed and yardage cost/kg of gain (P = 0.0002) were lower. By contrast, EW-CN steers that were the most profitable at the end of corn grazing backgrounding were less efficient (P = 0.008) and feed and yardage cost/kg of gain was higher (P = 0.0002). The NW-CN steers that grazed stockpiled dryland corn were the least efficient (P = 0.008) and had the highest feed and yardage cost/kg of gain (P = 0.0002).

Carcass closeout values for HCW (P = 0.78), dressing percent (P = 0.51), fat depth (P = 0.243), and yield grade (P = 0.23) did not differ. Corn grazing steers had significantly larger ribeye area (p = 0.053). Days on feed, which varied due to management system, directly affected marbling score (P = <0.0001) and the number of carcasses that graded USDA Choice or better (P = 0.10).

The combined effect of calf placement cost, ingredient cost, treatment cost, freight, and interest factors affected finishing net return. Calf placement cost had the most influence on net return. Closeout net returns were $3.11, -$84.06, $0.16, and $39.62/head for the NW-FLT, NW-CN, EW-CN, and EW-FLT, respectively.

Implications

Results suggest that greatest beef systems net return will be obtained when EW steers graze dryland unharvested corn and are sold at the end of backgrounding; however, when held until final harvest, early weaning and direct feedlot placement were associated with greatest net return.

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Table 1. Systems Backgrounding Performance

	NW- Ctrl Pasture/ Feedlot	*NW – Corn Grazing*	*EW – Corn Grazing*	*EW – Feedlot*	*SE*	*P-Value*
Weaning Date	Nov 7	Nov 7	Aug 15	Aug 15		
No. Steers	54	24	24	57		
System Days	84	21	70	86		
System Weaning Wt., kg[a]	197.9	289.8	212.3	183.7	10.02	0.44
System End Wt., kg	272.2	314.3	300.3	277.1	15.05	0.15
Gain, kg	74.5[ab]	24.5[b]	88.0[a]	93.4[a]		0.043
ADG, kg	0.887[b]	1.16[a]	1.26[a]	1.09[a]	0.057	0.004

[a]Weaned steers were held in drylot for 13 days before placement in the corn fields to get over weaning.

Table 2. Alternative Beef System Unharvested Corn, Pasture, and Feedlot Economics

	NW- Ctrl Pasture/ Feedlot	*NW – Corn Grazing*	*EW – Corn Grazing*	*EW – Feedlot*
No. Steers	54	24	24	57
Gain Value [a,b,c,d]	$9,979	$1,413	$4,724	$10,980
Input Cost:				
Pasture (Rent @$14.00/ac)[e]	$5,254			
Corn ($164/ac)		$2,214	$2,214	
Feedlot				$7,302
Backgrounding Net Return	$4,725	-$801	$2,510	$3,678
Backgrounding Net Return/Head	$87.50	-$33.38	$104.58	$69.56
Cost/kg Gain	$1.31	$3.77	$1.05	$1.37

[a]NW Control Gain Value (8,910lb@$112/cwt)
[b]NW Corn Grazing Gain Value (4,334lb@$109/cwt)
[c]EW Gain Value (1,296lb@$109/cwt)
[d]Gain Value (9,804lb@$112/cwt)
[e]Pasture Rent Calculation: 2.78 months, 2.5 AUM; = 6.95 Ac/AUM @ $14/Ac; = $97.30 x54 = $5,254.20

Table 3. Effect of Alternative Weaning Date and Corn Grazing on Steer Finishing Performance

	NW- Ctrl Pasture/ Feedlot	*NW – Corn Grazing*	*EW – Corn Grazing*	*EW – Feedlot*	*SE*	*P-Value*
Start Wt., kg	272.2[c]	339.2[b]	313.1[d]	183.6[a]	37.2	<0.0001
4% Shrunk End Wt., kg[a]	538.4	555.2	566.9	545.7	10.44	0.409
Days on Feed	192[d]	141.5[b]	165.7[c]	280.8[a]	3.44	<0.0001
Kill Age, Days	408.1	415.1	404.6	412.1	3.17	0.270
ADG, kg	1.39[b]	1.53[c]	1.53[c]	1.29[a]	0.025	0.0011
DM Fd/Head/Day, kg	9.12[b]	11.1[d]	10.2[c]	8.07[a]	0.23	<0.0001
DM Feed:Gain, kg	6.56[b]	7.26[c]	6.64[b]	6.26[a]	0.072	0.008
Fd & Yard Cost/Day, $	$2.096[b]	$2.723[d]	$2.383[c]	$1.715[a]	0.053	<0.0001
Fd & Yard Cost/kg of Gain, $	$1.51[b]	$1.78[c]	$1.56[b]	$1.33[a]	0.016	0.0002