South Dakota State University
Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange

South Dakota Beef Report, 2000 | Animal Science Reports

2000

Effect of Calving Time and Weaning Time on Feedlot Performance - A Preliminary Report

R. J. Pruitt
South Dakota State University

B. J. Johnson
South Dakota State University

W. B. Epperson
South Dakota State University

B. D. Rops
South Dakota State University

Effect of Calving Time and Weaning Time on Feedlot Performance - A Preliminary Report

R. J. Pruitt[1], B. J. Johnson[2], W.B. Epperson[1], and B. D. Rops[3]
Animal & Range Sciences and Veterinary Science

SDSU

CATTLE 00-8

Summary

Cows grazing native range year round at the SDSU Cottonwood Research Station were allotted to 3 management systems; Group 1) a calving season starting in mid March with calves weaned in late October, Group 2) a calving season starting in mid March with calves weaned in mid September, and Group 3) a calving season starting early May with calves weaned in late October. Following weaning the steer calves are transported to the Southeast South Dakota Experiment Farm. For two calf crops the steer calves have been fed a high grain diet for maximum gain from weaning to harvest.

Group 2 had a lower mean average daily gain than Groups 1 and 3. Feed conversion was not affected by treatment. There was not a consistent indication that groups weaned at a younger age (Groups 2 and 3) had more health problems than Group 1. Group 3 had the highest mean dressing percentage and carcass weight. Weaning at a younger age and a longer time on feed resulted in higher marbling scores for Group 2 compared to Group 1. This advantage in marbling was not observed for Group 3.

Introduction

When calf prices are high, there is a strong incentive to increase weaning weights. This has led many cattle producers to start the calving season early in the year for older and heavier calves at weaning time. In more recent years when calf prices have been relatively low in relation to input costs, there is a greater incentive to reduce costs of production.

There is strong interest among some cow-calf producers to change from a late winter calving to a spring calving season to reduce calf death loss, disease and input costs. There is limited information to predict how production and cost of production will change with this adjustment. The overall objectives of this study are to determine the effect of time of calving season and weaning on; 1) the performance of beef cows managed to optimize the use of native range; 2) the performance of calves from birth to carcass. The information reported in this paper addresses the second objective.

Materials and Methods

This study involves 126 crossbred cows grazing native range pastures at the SDSU Range and Livestock Research Station near Cottonwood, SD from November to May and pastures near Sturgis, SD during the summer. In the spring of 1996 cows were allotted by age and breed composition to 3 management systems (Table 1).

All male calves are branded, castrated and implanted with Ralgro at an average age of approximately 45 days of age and reimplanted with Synovex C approximately 90 days later. Steers are implanted with Synovex S at an approximate average age of 200 days and with revalor S at an approximate average age of 300 days. Following weaning, steer calves are transported to the Southeast South Dakota Experiment Farm, Beresford, SD where they are allotted by weight to 2 pens per treatment and fed a high grain diet for maximum gain to harvest. Upon arrival weaned calves are fed a receiving diet for 2 weeks that contains .47 Mcal NEg/lb dry matter (48.2% alfalfa hay, 39.9% corn, 8.9% supplement and 3% molasses on a dry basis). The amount of hay is decreased and the corn is increased so that after 6 weeks

---

[1]Professor
[2]Assistant Professor
[3]Research Ass't Cottonwood Station

calves are full fed a diet that contains .61 Mcal NEg/lb dry matter (79.5% corn, 10% alfalfa, 7.5% supplement, 3% molasses, 28 g/ton rumensin and 8.2 g/ton Tylan on a dry basis) for the remainder of the feeding period.

Weights, average daily gain, dry matter intake, feed conversion, number of days treated and cost of medical treatment were analyzed by the GLM procedure of SAS with pen as the experimental unit. Year and treatment were included as independent variables. Means were separated using the predicted difference option. The percentage choice and the incidence of lung and liver lesions were analyzed using the Chi-Square procedure of SAS. Other carcass characteristics were analyzed by the GLM procedure of SAS with steer as the experimental unit and year, treatment and age as independent variables. Means were separated using the predicted difference option.

Results and Discussions

Due to age, Group 1 (March calving/October weaned) was heavier at weaning and upon arrival in the feedlot ($P < .05$) than the other 2 groups (Table 2). Group 2 (March calving/September weaned) had lower average daily gain ($P < .05$) than the other 2 groups. Dry matter intake and feed conversion were similar for all treatments.

Since Group 1 (March calving/October weaned) was older and heavier at weaning they required less total dry matter ($P < .05$) during the feedlot phase compared to the other 2 groups (Table 2). This points out that weaning at a younger age (by weaning earlier in the year or by calving later and weaning at the same time) shifts production from grazed forage to harvested feeds.

A concern for weaning calves earlier than the traditional 7 months is their health following weaning. In the first year, the number of calves treated early in the feeding period was greater for Group 2 (weaned in mid September, $P = .01$) than Group 1 and 3 weaned in late October (Table 3). During the second year, Group 1 that was the oldest at weaning had the highest percentage of calves that were treated for illness, but the differences were not significant. The analysis of the number of days treated and the cost of medical treatment indicates that Group 2 and 3 did not require more medical treatment (Table 3) than Group 1 that was older at weaning.

Evaluation of lung and liver lesions at harvest is a tool to evaluate previous health status (Table 4). The incidence of each was low and the lesions were mostly small, indicating that serious health problems did not exist in this group of calves. The two groups weaned at a younger age did not experience greater health problems as indicated by the number of lesions detected.

The higher dressing percentage ($P < .01$; Table 4) of Group 3 and a tendency for higher final weights resulted in heavier carcass weights ($P < .001$) compared to Groups 1 and 2. Group 2 (March calving/September weaned) had higher mean marbling scores ($P < .05$) compared to the other groups. Studies at other research stations have shown dramatic increases in quality grades when calves were weaned as early as 90 days of age and fed a high grain diet to harvest. It is interesting that the Group 3 steers that started on feed at approximately the same age and on feed approximately the same length of time did not show the same advantage in marbling scores.

Steers from the third year of this project are currently on feed. Feedlot performance, health status and carcass information will be collected. An economic analysis using cowherd performance and post-weaning performance of the calves is planned.

Acknowledgment

This research is funded by the South Dakota Corn Utilization Council, the South Dakota Agricultural Experiment Station and a gift from Bill and Rita Larson through the SDSU Foundation. The authors thank the staff at the Southeast South Dakota Experiment Farm, Beresford, SD and the SDSU Cottonwood Research Station, Philip, SD for their support of this project.

Table 1. Three management systems.

Group	1	2	3
Calving season starts	March 15	March 15	May 1
Weaning time	late October	mid September	late October
No. of cows	42	42	42
Approximate calving season [a]	3/15 to 5/14	3/15 to 5/14	5/1 to 6/13
Approximate breeding season [a]	6/5 to 8/4	6/5 to 8/4	7/22 to 9/20
Approximate weaning date	10/31	9/14	10/31

[a]Breeding and calving seasons start 30 days earlier for the replacement heifers.

Table 2. Post weaning performance (Years 1 and 2)

Group	1	2	3		
Calving season starts	March 15	March 15	May 1		
Weaning time	late October	mid September	late October	SE[a]	Probability
Number of steers	30	43	38		
Age at weaning, days	208	173	162		
Days on feed	189	230	220		
Weight, lb					
Weaning weight	625^{b}	534^{c}	551^{c}	6	<.001
Initial feedlot weight	606^{b}	526^{c}	536^{c}	7	<.001
At last implant	984^{b}	996^{b}	1059^{c}	10	.001
Final weight	1256	1237	1275	20	.43
Average daily gain, lb./day					
Initial feedlot weight to last implant	3.56	3.18	3.44	.11	.10
Last implant to harvest	3.12	2.84	3.17	.16	.34
Initial feedlot weight to harvest	3.44^{b}	3.09^{c}	3.37^{b}	.07	.02
Dry matter intake, lb./day					
Initial feedlot weight to last implant	18.7	17.4	18.9	.6	.25
Last implant to harvest	22.4	21.6	22.4	.8	.78
Initial feedlot weight to harvest	20.4	18.9	20.1	.6	.22
Total dry matter per steer, lb.	3840^{b}	4350^{c}	4421^{c}	136	.03
Feed/Gain					
Initial feedlot weight to last implant	5.25	5.48	5.54	.20	.57
Last implant to harvest	7.85	7.87	7.12	.51	.52
Initial feedlot weight to harvest	5.96	6.12	6.00	.15	.74

[a]Standard error of the least square mean.
[b,c]Means in a row with uncommon superscripts differ (P< .05).

Table 3. Health records.

Group	1		2		3		
Calving season starts	March 15		March 15		May 1		
Weaning time	late October	SE[a]	mid September	SE[a]	late October	SE[a]	Probability
% treated for disease							
Year 1	0.0		21.7		0.0		.01
	0/18		5/23		0/19		
Year 2	25.0		15.8		5.3		.29
	3/12		3/19		1/19		
No. of days treated/steer	.25	.09	.20	.08	.03	.08	.15
medical treatment, $/steer	3.13	1.11	1.84	.94	.64	.99	.25

[a]Standard error of the least square mean.

Table 4. Data collected at harvest (Year 1 and 2)

Group	1		2		3		
Calving season starts	March 15		March 15		May 1		
Weaning time	late October	SE[a]	mid September	SE[a]	late October	SE[a]	Probability
Number of steers	30		42		38		
Age at slaughter	397		403		392		
Hot carcass weight, lb	761^b	12	748^b	10	798^c	11	<.01
Dressing percentage, %	60.9^b	.3	60.4^b	.3	62.4^c	.3	<.001
Yield grade	3.12	.10	3.20	.09	3.28	.09	.50
Marbling score (5.0=small^0)	5.48^b	.13	5.91^c	.12	5.55^b	.12	.03
% choice	83.3		90.5		79.0		.35
Lesions at harvest, Year 2							
% with liver lesions	0.0		21.7		0.0		.01
	0/18		5/23		0/19		
% with lung lesions	25.0		26.3		6.7		.31
	3/12		5/19		1/15		

[a]Standard error of the least square mean.
[b,c]Means in a row with uncommon superscripts differ ($P < .05$)