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

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Summary

Cows grazing native range year round were allotted to 3 management systems: 1.) A calving season starting in mid March with calves weaned in late October; 2) A calving season starting in mid March with calves weaned in mid September; and 3) A calving season starting early May with calves weaned in late October. After 2 years of the study, pregnancy rate and calving interval were not affected by management system. Average weaning weight was the highest for the March calving/October weaned group in both years. In the first year of the study, severe winter weather caused a lower calf survival to weaning for the March calving groups compared to the May calving group. This resulted in similar pounds of calf weaned per cow exposed for the March calving/October weaned and May calving/October weaned groups. Estimated income per exposed female was similar for these two groups. In the second year of the study, calf death loss was not affected by calving time. The heavier weaning weights of the March calving /October weaned group resulted in more pounds weaned per cow exposed and $30 greater income per exposed female. The potential to reduce costs for winter-feed, equipment, calving facilities and labor would favor later calving and must be considered.

Introduction

When calf prices are high, there is an 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

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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. Hoyt and Oedekoven (1994 SDSU Beef Report) reported that feed costs are approximately two-thirds of the cost of production for South Dakota beef cowherds and that high profit operators have approximately 10 % lower nonpasture feed costs than average. A common management strategy is to manage cow winter weight loss and then time the beginning of the breeding season to allow cows to gain weight rapidly on pasture for about 30 days prior to the breeding season. In western South Dakota this results in a breeding season starting in early June and a calving season starting in March. In this system it is difficult to meet the cow's NRC nutrient requirements during the winter with the forages available without high levels of supplementation. But winter weight loss can be compensated by rapid weight gain before breeding.

Another strategy is to match the cow's production cycle and nutrient requirements to the forage production cycle. In this system the cow's highest requirements after calving are matched with peak pasture forage quality. In western South Dakota this fits a breeding season starting in late July and a calving season starting in May. Later calving also has the potential advantages of reduced calf disease and death loss from severe weather, reduced costs for calving facilities and reduced labor during the calving season. Potential disadvantages of a May calving season include reduced reproductive performance from breeding in the hottest months of the year when forage quality is relatively low and lighter weaning weights if calves are weaned on the same date.

Another approach to reducing winter feed costs is to wean the calves early, which would allow the cows to be in higher body condition early in the winter.

There is strong interest among some cow-calf producers to change from a late winter calving to a spring calving season. There is limited information to predict how production and cost of production will change with this management 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 through slaughter.

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).

Cows graze native pasture year round and receive 1 lb. supplemental crude protein from December 1 to May 1. Grass hay is fed only when snow cover prevents grazing. Cows in estrus during 7 days following a prostaglandin injection are artificially inseminated. Cows are then exposed to bulls for 53 days and rectally palpated to determine pregnancy in November. Only cows that are not pregnant or have severe physical defects are culled.

To ascertain absorption of colostrum, blood samples are collected after 24 hours of birth. Plasma samples are frozen and later analyzed for total protein using refractometry. Total protein is well correlated with total immunoglobulin. If calves have plasma protein concentrations of 5.8 mg/dl or greater, they are considered to have adequate absorption of colostrum.

Following weaning heifers are fed in drylot to gain 1.5 lb per day until May 1 when they are turned out to native pasture. Potential replacement heifers from each system are selected based on actual weight. Heifers are bred to start calving 30 days earlier than the cows. They are estrus synchronized with Synchromate B and inseminated 48 to 56 hours after implant removal. They are then exposed to a bull for 45 days and rectally palpated for pregnancy diagnosis in the fall.

All male calves are branded, castrated and implanted at an average age of approximately 45 days of age and reimplanted 90 days later. Following weaning, steer calves are transported to the SE Experiment Station; Beresford, SD where they are fed a high grain diet for maximum gain to harvest.

Results and Discussions

In 1997 the percentage of calves alive at 1 week ($P=.07$) and at weaning ($P=.10$) was greater for the May calving group than the March calving groups (Table 2). Since calf survival was calculated as the number of calves alive divided by the number of pregnant cows the previous fall, loss of calves includes both abortions and losses after birth. The number of calf deaths shortly after birth in the March calving groups was affected by the severe winter weather during the winter of 1997.

In 1998 the overall low calf survival was due to the number of cows examined pregnant in the fall that did not calve. Calf survival was similar for the March and May calving groups. The mild winter of 1998 resulted in a low calf death loss after calving. Absorption of colostrum as indicated by total plasma protein was not affected by calving time.

Calf birth weights were similar for each management system (Table 3). In both years the calves born in March and weaned in late October were the heaviest at weaning ($P<.05$) due to being older at weaning. In 1997 the May calving/October weaned group was 25 lb. heavier than the March calving/September weaned group that were about the same age at weaning. This was due to a higher average daily gain from birth to weaning for the May calving group ($P<.05$). In 1998 there was the same tendency for greater average daily gain for the May calving group but it was not significant.

In the first year there was a higher percentage of cows in the May calving group in estrus ($P=.001$) during the first 7 days of the breeding season following an injection of prostaglandin (Table 4). In the second year, the cows cycling in each group were similar. The calving interval for both years was not affected by calving time or weaning time. (Table 3).

The time of the calving season did not affect pregnancy rate (Table 4). The possible nutritional advantage during the calving season in May and June might have been offset by a breeding season during late July and August when the weather is hot and forage quality is relatively low. Weaning calves early in the fall of 1997 did not result in a higher pregnancy rate in 1998.

Table 5 shows calculations based on the preliminary data presented in this paper. Even though calf weaning weights were lower for the May calving/October weaned group compared to the March calving/October weaned group, the pounds of calf weaned per cow exposed were nearly identical in 1997. Due to a greater potential price per hundred weight, the income per exposed cow for the May calving/October weaned group is slightly higher than the March calving/October weaned group.

With similar calf survival in 1998, the advantage in weaning weights resulted in more pounds weaned per cow exposed for the March calving/October weaned group compared to the other two systems. Although the income per exposed cow is $30 less for the May calving/October weaned system in 1998, it may be possible to reduce annual cow cost in a May calving system through reduced dependence on equipment and facilities or reduced labor that would allow more cows per family unit or lower labor costs. Although each management group received the same level of nutrition in this study, in many cases a reduction in winter-feed costs greater than $30/cow could be achieved by calving in May.

The current project will continue to record reproductive performance for 5 years. It will be important to evaluate the cumulative effect of the three systems on reproductive performance. A more complete economic analysis will be done.

Table 1. Three Management Systems

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]The breeding and calving seasons start 30 days earlier for the replacement heifers.

Table 2. Effect of Calving Season on Calf Survival

Calving season starts	March 15	May 1	probability of a difference
Total plasma protein, mg/dl			
1997	7.55	7.98	0.79
1998	7.06	7.17	0.51
% adequate total plasma protein [a]			
1997	94.6	91.9	0.58
1998	94.1	93.8	0.95
% calves alive at 1 week [b]			
1997	88.1	97.6	0.07
1998	91.6	92.7	0.83
% calves alive at weaning [b]			
1997	85.5	95.2	0.10
1998	90.4	87.8	0.66

[a]>5.8 mg/dl
[b]of cows pregnant the previous December

Table 3. Effect of Calving Time and Weaning Time on Calf Performance

Calving season starts	March 15		March 15		May 1		
Weaning time	late October		mid September		late October		probability
Calf birth weight, lb							
1997	91.1		89.2		88.0		.45
1998	85.3		84.5		84.0		.82
age at weaning, days							
1997	212	a	172	b	175	b	<.001
1998	216	a	182	b	180	b	<.001
Actual calf weaning weight							
1997	571	a	484	b	509	c	<.001
1998	615	a	532	b	544	b	<.001
Calf average daily gain, lb/day							
1997	2.29	a	2.32	a	2.43	b	.02
1998	2.46		2.49		2.59		.08
Calving interval (includes only cows weaning a calf)							
1997-98	371		372		374		.84
1998-99	375		380		376		.53

[a, b, c] Means with uncommon superscripts differ (P<.05).

Table 4. Effect of Calving Season on Reproductive Performance

Calving season starts	May 15	May 1	Probability of a difference
% in estrus first week breeding season [a]			
1997	28.2	61.5	0.001
1998	46.7	55.6	0.38
% pregnant [a]			
1997	91.6	89.7	0.75
1998	92.0	88.9	0.59

[a]includes only cows weaning a calf

Table 5. Calculated LB Weaned and Income Per Cow Exposed[a]

Calving season starts	March 15	March 15	May 1
Weaning time	late October	mid September	late October
1997			
assume % pregnant, 1996	90.7	90.7	90.7
% alive at weaning	85.5	85.5	95.2
actual weaning weight	571	484	509
lb weaned/cow exposed	443	375	440
estimated $/cwt [b]	76.83	80.48	79.43
income/cow exposed, $	340	302	349
1998			
% pregnant, 1997	90.7	90.7	90.7
% alive at weaning	89.1	89.1	89.1
actual weaning weight	615	532	544
lb weaned/cow exposed	497	430	440
estimated $/cwt [b]	75.00	78.47	77.96
income/cow exposed, $	373	337	343

[a] If affected by treatment (P<.10) then treatment means is used. If not affected by treatment, the overall mean is used.

[b] estimated from calf prices at SD sale barns during October of 1998, adjusted for calf weight and sex.