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Effect of Weaning Date on Performance of Beef Cows

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Summary

Records from 92 mature crossbred cows calving in March and April were used to determine the effect of weaning calves 40 days earlier than the traditional weaning time on cow weight change, body condition, and reproductive performance. When calves were weaned early (September 14 versus October 23), their dams gained more weight from September 14 to early December and had higher body condition scores in December than the dams of later weaned calves. The two nutritional treaments imposed after calving were important in explaining the effects of earlier weaning on cow reproductive performance. For cows that were fed grass hay at 75% of NRC energy requirements in drylot after calving, the advantage of higher weight change and body condition scores from early weaning persisted until the following May. This resulted in a higher percentage conceiving during the first 21 days of the breeding season. For cows on Moderate postcalving nutrition, the advantages of weaning early on weight change and body condition were gone by early May, resulting in no difference in reproductive performance. For spring calving cows with access to abundant forage for at least 30 days prior to the breeding season to compensate for undernutrition during the winter, weaning calves earlier than the traditional weaning time may only be beneficial to reproductive performance when winter nutrition is severely limited.

Key words: Beef Cow, Weaning Date, Nutrition, Reproduction

Introduction

Winter nutrition of the beef cow has a large impact on reproductive performance. The challenge is to minimize winter feed costs and still have a high percentage of cows that cycle and conceive early in the breeding season to maintain high pregnancy rates over the long term. Previous studies at the SDSU Cottonwood Research Station have demonstrated the importance of adequate cow body condition at calving and prior to the start of the breeding season to obtain high reproductive performance. There is recent interest in weaning calves earlier than the traditional weaning times to allow cows to gain weight and improve body condition prior to the winter feeding period. This would seem to be an advantage for cows with the genetic potential for above average growth and milk production that tend to be thinner in the fall. In theory this would allow lower winter feed costs for the cow herd. A previous study (Pritchard et al., 1988 SD Beef Report) indicated that calves weaned at 5 1/2 months of age could be marketed for slaughter at a younger age than calves weaned at 7 months of age with no adverse effects on feedlot performance or carcass traits when an accelerated feeding program was used.

It is a common practice to wean calves earlier when feed supplies are scarce or expensive such as under drought conditions. There is limited information on the effects of weaning calves 30 to 60 days early as a routine practice to improve reproductive performance of the cow herd. The objective of this analysis is to evaluate the effect of weaning 40 days earlier than the traditional weaning time on the weight change, body condition, and reproductive performance of cows managed under western South Dakota range conditions.

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Materials and Methods

Records from 92 mature (4.5 to 6.5 years) Simmental x Angus crossbred cows with Charolais sired calves were used to evaluate the effect of weaning earlier than the traditional weaning date on cow performance. The cow herd is maintained on native range pastures at the SDSU Cottonwood Research station west of Philip, SD, from late October to early May and near Sturgis, SD, from early May to late October.

The early weaned group was weaned on September 14 when calves were an average age of 162 days and the late weaned group was weaned at the traditional weaning time on October 23. Following weaning, cows were maintained as a group on native range pasture until calving. Within two weeks following calving, cows were weighed and allotted by calving date to a Low or Moderate postcalving nutritional treatment. Cows on the Low nutritional treatment were limit fed grass hay in drylot to 75% of NRC requirements for energy. The cows on the Moderate nutritional treatment grazed winter range. All cows received 2 lb of pelletted soybean meal to provide .75 lb crude protein per cow daily from December 4 to May 9. Postcalving nutritional treatments continued until May 9 when all cows grazed native range as one group without supplementation until the following winter.

Blood was collected by jugular venipuncture from all cows on June 1 and June 8. Blood was centrifuged and serum frozen for later progesterone analysis by radioimmunoassay. Cows with greater than 1 ng progesterone per ml of serum on either bleeding date were considered cyclic. Cows were observed for estrus and artificially inseminated during the first 21 days of the breeding season (starting June 8) followed by exposure to 4 bulls for 39 days. Conception date was estimated by subtracting 283 days from the calving date the following year. Cows were palpated for pregnancy on October 24 and open cows were sold for slaughter. All weights were taken after removal from feed and water overnight. Condition scores (1-9; 1 = extremely thin and 9 = obese) were assigned by two people immediately after weighing.

Results and Discussion

Calves that were weaned 40 days earlier than the traditional weaning date were 103 lb lighter ($P<.05$) when weaned (Table 1). The calf average daily gain of 2.58 lb indicates that the available forage and cow milk production was not greatly limiting calf growth during late September and October. Cows whose calves were weaned early gained more during the period between early weaning and the traditional weaning date even while overcoming the stress of weaning. There was a 41-lb difference in cow weight change from mid September to early December between the two weaning groups ($P<.05$) and a .5 condition score difference ($P<.05$) in early December. Prior to the beginning of the calving season in March, the advantage in weight change was 26 lb ($P<.05$) and the cow condition scores of the two groups were similar.

The interactions between weaning date and postcalving nutrition are important in evaluating the potential benefits of early weaning (Table 2). For cows on the Moderate postcalving nutrition treatment, later weaning resulted in less weight loss from March to May ($P<.05$). This is probably due to compensation for greater weight loss earlier. Weaning date did not affect weight change from March to May for cows on the Low postcalving nutrition treatment. When feed was restricted after calving (Low treatment), the effect of weaning date was reflected in weight change from mid September to early May and May condition score. When cows received the Moderate postcalving nutrition, the advantages in weight and condition score due to weaning date disappeared by May.

Cow weight change from May to June demonstrates the potential for cows to compensate for under nutrition during the winter if abundant spring forage is available. Those treatment groups that lost more weight from September to May gained the most from May to June. While postcalving nutrition still affected cow condition just prior to the breeding season in early June, weaning date only affected condition scores for those cows on Low postcalving nutrition which was a relatively severe restriction in energy consumption.

Table 1. Effect of weaning date on cow and calf performance

Weaning date	September 14	October 23
Number of cows	49	43
Calf age at weaning, days	162	202
Calf weight, lb		
September 14	494	492
Weaning day	494[a]	597[b]
Cow weight September 14, lb	1112	1140
Cow weight change, lb		
September 14 to October 23	74[a]	53[b]
September 14 to December 4	19[a]	-22[b]
September 14 to March 4	68[a]	42[b]
Cow condition score, 1-9		
September 14	5.3	5.2
October 23	6.4[a]	6.0[b]
December 4	6.0[a]	5.5[b]
March 4	5.2	5.1

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

Table 2. Effects of weaning date and postcalving nurition on cow perforamnce

Postcalving nutrition	Low		Moderate	
Weaning date	Sepember 14	October 23	September 14	October 23
Number of cows	23	23	26	20
Cow weight change, lb				
March 4 to May 9	-140[a]	-138[ab]	-118b	-86[c]
September 14 to May 9	-151[a]	-194[c]	-98[b]	-103[b]
May 9 to June 1	85[a]	106[a]	44[b]	49[b]
September 14 to June 1	-66[ab]	-89[a]	-54[b]	-54[b]
Cow condition score				
May 9	4.1[a]	3.6[c]	4.7[b]	4.7[b]
June 1	4.2[a]	3.9[a]	4.8[b]	4.6[b]
Percentage cycling by the beginning of the breeding season	39.1[a]	43.5[a]	76.9[b]	55.0[ab]
Percentage in estrus during a 21-day AI period	82.6	73.9	92.3	95.0
Percentage pregnant				
21-day AI preiod	69.6[a]	34.78[b]	76.9[a]	70.0[a]
Entire breeding season	96	100	100	95
Conception date	June 26	July 3	June 25	June 26

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

The pregnancy rate during the breeding season was greater than 95% for all four treatment groups. The lower cow condition scores and winter weight change of the later weaned cows in the Low nutrition group resulted in fewer cows conceiving in the 21-day AI period ($P<.05$) and a tendency for later average conception date. Although the percentage pregnant for the entire breeding season was not affected by treatment, the cumulative effect of later calving over several years could be expected to cause a reduction in pregnancy rates.

The potential advantages on reproductive performance of mature cows from weaning calves earlier than the traditional 7 months of age appears to depend on winter nutrition. Based on the conditions of this study, weaning earlier as a standard practice would not produce any advantage in reproductive performance of mature cows. Under conditions of extreme feed shortage or high cow feed costs, weaning earlier than the traditional 7 months may be beneficial to reproductive performance of the cow herd. For most situations, decisions on changing the traditional weaning date should be based on the pasture conditions and potential effects on calf performance, costs of feeding the weaned calf, and changes in calf price due to season and weight.