

Calf Weaning Can Alter Nutrient Requirements of Cows

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Findings

- Weaning calves early increased subsequent weight gain of their dams.
- Calves weaned early were lighter the following spring.
- Producers facing shortages of forage can use this management tool to decrease nutrient requirements of lactating cows.

Introduction

Louisiana forages are often low in quality in late summer. Nutrient intake from forage by a mature cow will usually exceed the requirement for maintenance but may not be high enough to meet the additional requirement for lactation. When nutrient intake is below requirements, the cow must pull nutrients from body reserves to meet her requirements. The result is weight loss and a decrease in body condition.

Several studies have indicated that higher conception rates are attained if cows have a body condition score of 5 or 6 at calving and at the beginning of the breeding season. Lower conception rates are observed when body condition is below 5. Most spring-calving cows in Louisiana are fed hay in the late fall and winter before calving. Because of the difficulty encountered with putting up good-quality hay in Louisiana, it is often hard to increase the condition of spring-calving cows during the 60 to 90 days before calving. Part of this difficulty is caused by an increase in the nutrient requirements of the cow. In addition to maintenance requirement, the cow has nutrient requirements for fetal development. With low-quality forage, the cow may not be able to consume enough to meet the combined requirements.

Depending on the nutrient quality and cost of the diet, it may be more economical to raise the condition of the thinner cow at weaning instead of waiting until 60 to 90 days before calving. From weaning until about 90 days before calving, mature cows' requirements (considered maintenance requirements) are the lowest of any point during the calf-producing cycle. Any nutrient intake above maintenance requirements will be used to replenish body reserves (increase body

condition score). This study was conducted to determine if weaning calves two months earlier than normal would increase weight gain and condition score of cows and their subsequent reproductive performance.

Experimental Approach

Seventy-seven cows were used in this study. Cows were blocked by age classification and sex of calf then randomly assigned either August weaning (40 head) or October weaning (37 cows). Age classification consisted of: 1 = first calf heifers (35 head), 2 = second calf heifers (20 cows) and 3 = mature cows (22 cows). Animals were weighed and cows scored for body condition (1 to 9 scale) on August 19. After weighing, all cows and the calves that were not weaned were placed on bermudagrass/bahiagrass pastures. Calves assigned to August weaning were moved to a 160' X 200' dry lot and fed good-quality bermudagrass hay for a 5-day weaning period.

On October 14, the cow/calf pairs and the dry cows were weighed and scored for body condition. Calves assigned to the October weaning group were placed in a 160' X 200' dry lot and fed good-quality bermudagrass hay for a 5-day weaning period. Subsequently, the August weaned calves were weighed. After weighing, the cows were returned to bermudagrass/bahiagrass pastures and grazed until mid-November, then fed hay until calving. After calving, cows were placed on ryegrass pastures. Cows were weighed and scored for body condition before calving in February and again before the breeding season in mid-April. Cows were palpated for pregnancy in September.

All calves were injected with Ivomec according to the label after the October weaning and sorted into two groups based on sex. Calves were grazed on hay meadow regrowth or fed hay until mid-November, at which time they were placed on ryegrass pastures. Calves grazed ryegrass until the end of data collection. Calves were weighed in January and received another injection of Ivomec on this date. Weights also were recorded in early-April and mid-May. Steer calves were sold in mid-May.



Results and Discussion

There was no difference in cow weight in August (Table 1). Cows whose calves were weaned in August were heavier in October, February and April ($P < .05$) than cows who nursed calves until October. Body condition scores also were higher for cows whose calves were weaned in August compared to the cows whose calves were weaned in October. These results demonstrate the higher nutrient requirements for cows nursing calves (October-weaned) compared to cows at maintenance (August weaned). The nutrient intake of the dry cows was high enough to meet the maintenance requirements plus some additional nutrients for storage, resulting in increased condition score and weight gain. Nutrient intake of cows that were lactating was not high enough to meet both maintenance and lactation requirements. These cows used consumed nutrients and body stores to meet their nutrient requirements, hence the weight and condition score loss.

After the calves were weaned in October, weight and condition score changes of both groups of cows were similar (Table 1). Cows that nursed calves into October, however, did not attain either the body weight or the condition score of cows whose calves were removed in August. There was no effect of time of weaning on fall pregnancy rates. This is probably a reflection of adequate condition for both groups of cows at calving and at the start of the breeding season. The August-weaned cows had an average condition score of 5.9 at calving and 6.0 at breeding, and the October-weaned cows had an average condition score of 5.5 at calving and 5.6 at breeding. Condition score of both groups of cows was high enough to expect good conception rates.

There was no difference in calf age or weight in August (Table 2) when the first group of calves was weaned. The calves allowed to stay on their dams were heavier in October than the calves weaned in August. This weight advantage was 37 pounds. Weight gain after October was similar for the two groups of calves, thus the difference in the October weight was maintained through mid-May, with the August-weaned calves weighing 29 pounds less than the October-weaned calves.

Perhaps the most surprising finding was no difference in cow age on the weight or condition score change caused by time of weaning (Table 3). First-calf and, to some extent, second-calf heifers still have a nutrient requirement for growth. In general, growth requires less energy than fattening, and the first-calf and second-calf females were expected to

have a different weight and condition score change pattern than mature females.

Results from this study indicate that we can change the weight and body condition of beef cows by altering the time the calf is weaned. There was no improvement in fall conception rates due to the increased condition, but the condition scores of the cows whose calves were weaned in October were higher than 5 both at calving and at the beginning of the breeding season. If the condition of these cows had been lower at weaning, differences in reproduction would probably have been observed. The improvement in body condition did have an associated cost because of lower weight gains of August-weaned calves. The average weight of calves was 37 pounds less in mid-October and 29 pounds lighter the following May. This difference is magnified if calves were to be sold at weaning. August-weaned calves weighed 78 pounds less in August than October-weaned calves did in October. This may be offset somewhat by the traditional higher prices of calves in August compared to October, but this factor must be considered.

Altering the time of weaning to change cow condition is a management tool that can be used, but calf weight will be affected. This tool may have application in situations where cows are thin in late summer to early fall. The cost of feed required to replace the condition of the cows after weaning and the lower weight of the calves need to be considered in this decision.

Table 1. Effect of date of weaning on cow weight and condition score

Item ^a	August wean	October wean	Standard error	P = ^a
Body weight, lb				
Aug 19	1127	1103	18	0.352
Oct 14	1161	1084	19	0.005
Feb 4	1287	1191	19	0.001
April 14	1245	1177	19	0.015
Condition score				
Aug 19	5.5	5.4	0.1	0.420
Oct 14	5.9	5.2	0.1	0.001
Feb 4	5.9	5.5	0.1	0.019
April 14	6.0	5.6	0.1	0.054
Pregnancy rate, %	92.3	92.1		

^aValues of $P < .05$ indicate that row means are different.

Table 2. Effect of date of weaning on calf weight gain after weaning

Item	August wean	October wean	Standard error	P = ^a
Calf age, day				
Aug 19	167	163		
Oct 14	223	219		
Body weight, lb				
Aug 19	425	423	7	0.777
Oct 14	466	503	7	0.001
Jan 13	539	570	8	0.009
April 4	726	757	11	0.033
May 18	792	821	11	0.074

^aValues of P < .05 indicate that row means are different.

Table 3. Effect of date of weaning and cow age on cow weight and cow condition score

Item	1 st calf		2 nd calf		Mature	
	Aug	Oct	Aug	Oct	Aug	Oct
Body weight, lb						
Aug 19	1039	1024	1090	1086	1253	1201
Oct 14	1065	982	1151	1070	1270	1202
Feb 4	1187	1091	1250	1147	1425	1335
April 14	1100	1050	1271	1199	1363	1282
Condition score						
Aug 19	5.5	5.5	5.2	5.1	5.9	5.7
Oct 14	5.7	5.1	5.9	4.9	6.2	5.6
Feb 4	5.5	5.2	5.8	5.5	6.4	5.8
April 14	5.3	5.0	6.1	5.9	6.4	6.0
Pregnancy rate, %	89.5	88.0	87.5	90.0	92.3	95.4