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BENEFITS OF WEANING CALVES AT YOUNGER THAN TRADITIONAL AGES

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INTRODUCTION

The term "Early Weaning" tends to be used rather loosely in the Beef Industry, and producers can find many articles claiming benefits of early weaning. A few questions arise. How early is early weaning? Is there economic benefit to weaning early? We will address these questions in this paper.

At the Range Beef Cow Symposium XIV, Whittier (1995) categorized early weaning as 1) weaning before the start of the breeding season (birth to 90 days) or 2) weaning during the breeding season (90 to 160 days). Weaning calves before the start of the breeding season has shown to improve reproductive performance of cattle during the year in which calves are weaned (Geary et al., 2006; Lusby et al., 1981). Improved reproduction can be due to removal of the sucking stimulus and/or from improved energy balance of the cattle. Cattle that are in marginal to thin body condition score at the start of breeding may benefit more than well conditioned cattle (Whittier, 1995). Weaning calves late in the breeding season likely will not yield any improvements in reproduction during the year in which calves are weaned.

While calves can be weaned at 60-100 days, more intense calf management is necessary, making the practice unpractical for many producers. Recent worked out of Miles City, MT showed that calves weaned early at 80 days and put on a growing ration until herd-mates were weaned at about 215 days resulted in the early weaning system having significantly less net income than the normal weaning system (Waterman et al., 2006). Weaning towards the end of the breeding season, 120-160 days, is more practical and can have benefits in certain situations. This paper will focus on time of weaning calves from 120 days and beyond.

ENERGY REQUIREMENTS AND BODY CONDITION SCORE

At these meetings in 2005, Adams (2005) stated that "If ample forage is available for grazing, milk production is likely the key factor in managing body condition during late summer and fall." The amount of milk is primarily determined by genetics, with some influence from diet quality. The timing of the milk production is relative to time of calving and time of weaning. Within a given year, time of weaning may be the most cost effective tool a manager has in manipulating energy balance of a cow during late summer and fall. When energy status of the cow is improved, body condition score change will be more positive.

Reports have shown that body condition score of a cow at calving is important to reproductive performance. If spring calving cows are not in acceptable body condition going into the winter, they can be fed to improve body condition score. However, feeding cows to

improve body condition during the winter can be expensive. If cows go into the winter in good body condition, the option to run cows on grass or with less supplemental feed is feasible. Extended grazing systems have been shown to improve returns to cow-calf production systems (Adams et al., 1994). Will weaning in late summer or early fall influence body condition score? Is there an effect on forage utilization? We will look at a few recent studies from this region of the United States to evaluate this.

EFFECTS OF EARLY WEANING ON CATTLE AND THE FORAGE RESOURCE

As part of a Four-States Ruminant Consortium, we put together a group of scientists from South Dakota State University, North Dakota State University, and the University of Wyoming to evaluate early weaning of beef calves (Landblom et al, 2006). At research stations near Buffalo, SD, Dickenson, ND, and Laramie, WY, March-April born calves from research herds over a two-year period were weaned at approximately 140 days of age (mid-August) or at approximately 215 days of age (early-November). Calves were vaccinated at two-four weeks prior to weaning and again at weaning. Calves were backgrounded for about 50 days and then finished. Cow body weights and body condition scores were taken throughout the study.

Cow body condition score change between the August and November weaning dates for the August weaned grouped ranged from positive 0.22 body condition score at Laramie to a positive 0.91 at Dickenson (Table 1). Cow body condition score change during that period of time for the November group ranged from negative 0.02 at Buffalo to a negative 0.55 at Dickenson. The result was that there was bout a 0.5 to 1.0 improvement in body condition score of August-weaned versus November-weaned cows in November. Adams (2005) estimated that in the Sandhills of Nebraska, body condition score declined 0.1 BCS/2 weeks if a cow was suckling a calf from August to November, or about 0.5 of a BCS.

As expected, the November weaned calves were significantly heavier at weaning than August weaned calves (Table 1). Interestingly, calf gains on the cow from August to November were over 2.0 lbs/day at Laramie and Buffalo, but closer to 1.0 lb/day at Dickenson. I think that is real world. Forage quantity and quality, as well as milk production potential of the cow, affect calf gains late in the year. When calf performance on the cow is poor, there may be a greater advantage to weaning the calf and growing it at a faster rate. First calf heifers, for instance, have lower milk production and can thus have less calf growth.

The backgrounding data for this multi-state weaning study are shown in Table 2. Calf gains were similar overall, but the early weaned calves were significantly more efficient at converting feed to gain in two of the three locations. Finishing performance was not markedly different between treatments, except early weaned calves finished at an average 32 days younger and 51 additional days on feed. The early weaned calves were more efficient at converting feed to gain in two of the three groups during the finishing phase.

As part of the study, multiple plots in six pastures were clipped and the forage weighed prior to the August weaning date and then after the November weaning date. Three pastures were

grazed with pairs from August to November and three pastures were grazed with dry cows that had their calves weaned in August. Dry cows removed 28% the amount of forage that pairs removed during the same period of time. This decrease in forage removed could be associated with lower cow intakes, less trampling, and the elimination of calf grazing. The data showed that in the pastures with dry cows, there was 262 less lbs of forage/acre removed. If you assumed cows could only consume ½ of that (the other half would be lost due to trampling, unavailability, etc), there would be and additional 131,000 lbs of grazed forage in a 1000 acre pasture. If that pasture were stocked with 175 cows beginning at the August weaning date, you would get about 29 days of additional grazing in that pasture if the cows were dry compared to pairs to result in similar biomass remaining after grazing. That is a hypothetical example, but it shows that weaning calves in late summer can be used to extend grazing or increase the amount of forage remaining. This could be extremely valuable in drought scenarios and highlights the importance of putting some value on the range when looking at economics of weaning earlier.

ECONOMICS OF WEANING EARLY

We sell on weight in the commercial cattle business, and weight is obviously an important factor in the revenue received for calves. You must also include the costs associated with achieving that weight into calculations. Adams (2005) reported a study in Nebraska where spring-born calves were weaned in August versus November. He included partial cost and revenue differences between August and November weaned cow herds, including costs of grazing calves. Net returns at weaning for non supplemented cattle were $4.67 higher for August-weaned compared to November-weaned cattle. Since market prices and costs change over time, I interpret this as about the same return. The August weaned cattle were lighter, but brought more dollars per pound. Nevertheless, calf revenue was about $27 less for the August weaned calf. Due to the cost of grazing (they charged the pairs about $16 additional for grazing from August to November) and the added value of culls in the August system, the costs made up for the lack of revenue (subtracting cull cow values from costs). Cull cows were worth more in the August system due to a better seasonal market and heavier weights and condition scores earlier in the fall. Net returns at slaughter were greater for the November-weaned calves compared to August-weaned calves. August-weaned calves required more days on feed and had higher feedlot costs. So, when forage was available, it was cheaper to let the cow and the grass put the gain on the calves than it was to feed the gain on the calves in the feedlot. You cannot overlook the importance of evaluating the entire system when making these decisions.

In the hypothetical example given above with early weaned cows grazing the pasture for an additional 29 days, you can put a value on early weaning. One approach would be to calculate feed savings for the additional $29 days of grazing. If it cost $1.00/day to feed a cow hay, the value would be $29/head. That would be dependent on forage availability and stocking rate. If you priced AUM's at $20/AUM, the value would be $19/head for the extended grazing offered by early weaning. However you calculate it, there is a value to the grass savings.

Pruitt (2003) showed a $45 reduction in revenue/cow exposed for March-born calves weaned in mid-September compared to late October. That could probably not be made up by grass savings alone. It is harder to quantify what the value of the added condition on early-weaned cows is. If cows are fleshy in the fall, there is likely little benefit to added condition on early-weaned cows. On the other hand, if the result of early weaning is a cow in a body condition score 4 versus a cow in a body condition score 5, there would likely be feed savings associated with having the cow at higher condition score. Subsequent reproduction may also be affected if body condition is not put back on thin cows.

APPLICATION OF EARLY WEANING

At the Padlock Ranch, we calve in May and June and retain ownership on all the calves at least through growing and for many of them until slaughter. Since we are retaining ownership, we would like our calves to come in off the cow as heavy as possible. However, weather, location of cows, and established market out dates for calves necessitates most the calves be weaned by December. Many of our calves would be weaned before 180 days even without an attempt to wean early. As we get later in the Fall when we wean, there is usually not as good of an opportunity to put condition on cows as there would be if we weaned in August or September. Performance on our young calves in the feedyard is usually very good.

We do wean earlier than normal if necessary to manage body condition score and to manage grass during drought conditions. Our system is to winter as many cows on native range as possible, and we can better accomplish this if the cattle are not too thin. With calving in May, we do not get too concerned about some cattle being thin during the winter as they put on substantial condition in late April and May. There are more risks, however, with thin cows if the weather turns bad or if the lack of winter and spring precipitation results in poor growth of cool season grasses in the spring. We usually wean calves off of first-calf heifers at 120-135 days (mid-September to early October). We usually see an improvement in body condition score by doing this, and we are concerned about those cattle getting too thin and not rebreeding with their third calf. Early weaning is an outstanding tool for managing body condition in young cows.

In conclusion, weaning calves at an earlier than normal age is a great tool at a manager's disposal to manage both grass and body condition score of cows. Research has documented that for spring calving cows, there is often a 0.5 to 1.0 difference in body condition score between August-weaned and November-weaned cows in November. Milk production differences between cows and annual variation in forage quality can impact the magnitude of body condition score change. Early weaning can be a good tool to keep young cows in good condition and thus improve reproduction in their first few years in the herd. From an economic perspective, early weaning is not a magic bullet. However, if you have a marketable sized early-weaned calf to sell, returns at weaning may not be much different than that of normal weaning. If you are retaining ownership on calves, it may advantageous to not early wean unless you can benefit from extended grazing and/or improved cow body condition score. This is dependent, however, on the costs of your grass and also feed and management costs for the early-weaned calf. I have seen producers that retain ownership of

early-weaned calves every year because they can simply make it pay. Many producers like the performance and feed efficiency of retained, early-weaned calves. Every business would need to make this calculation given current costs and markets to make a wise decision. Do not forget to look at the whole system when making a decision on time of weaning.

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Table 1. Body weight and condition score change among early and normal weaned cows from NDSU-Dickinson REC, SDSU- Antelope Station and UW - Beef Unit (2003-2004).

	NDSU Dickinson REC		SDSU Antelope Station		UW Beef Unit	
Item	Weaning Period		Weaning Period		Weaning Period	
	Early	Normal	Early	Normal	Early	Normal
August Cow Wt., lb	1299	1336	1343	1330	1239	1250
November Cow Wt., lb[a]	1314	1200	1376	1283	1356	1277
Cow Wt. Change, lb[a]	15	-137	33	-46	117	26
August BCS	5.18	5.26	5.63	5.65	5.53	5.60
November BCS[a]	6.09	4.71	5.97	5.63	5.75	5.14
BCS Change[b]	0.91	-0.55	0.34	-0.02	0.22	-0.46
August Calf Wt., lb	397	403	408	403	467	465
November Calf Wt., lb	-	467	-	582	-	655

[a]Treatments at each location differ (P<.01)
[b]Treatments at Dickinson and Antelope locations differ (P<.01)

Table 2. Summary of backgrounding performance for early and normal weaned steers at NDSU-Dickinson REC, SDSU- Antelope Station and UW - Beef Unit (2003-2004)

	NDSU Dickinson REC		SDSU Antelope Station		UW Beef Unit	
Item	Early	Normal	Early	Normal	Early	Normal
No. Steers	68	66	36	35	46	16
Days on Feed	53	53	49	54	50	51
Start Wt., lb[a]	412	578	414	600	487	686
End Wt., lb[b]	593	743	568	765	602	820
ADG, lb[c]	3.44	3.15	3.15	3.05	2.27	2.67
Feed:Gain, lb[a]	4.85	6.72	5.09	6.45	5.93	6.90

[a]Treatments at Dickinson and Antelope Stations Differ (P<.01)
[b]Treatments at all locations differ (P<.10)
[c]Treatments at Dickinson differ (P<.01)