

Evaluating a Early Weaning Drought Management Strategy
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Reducing Forage Needs

When forage production is low and it becomes necessary for producers to make management adjustments to reduce forage needed for the cow-calf enterprise, there are several options that can be employed:

- Sell cows
- Early wean calves
- Lease additional pasture
- Feed additional energy to reduce grazing

It can be challenging to cost effectively lease pasture, feed energy, or sell cows just to buy them back when forage production improves. Early weaning, especially when combined with one or more of the other options listed, can be a useful tool to manage forage supply while minimizing the need to feed energy or dramatically liquidate cattle.

A forage budget can be developed mathematically or visually estimated by experienced producers. Regardless of the method employed, during years of low forage production, producers should calculate or estimate stocking rate reductions needed to balance forage supply and demand. Mathis and Encinias publication Guide B-126, *“Early Weaning Beef Calves”* outlines a method for calculating a forage budget.¹

Early Weaning

Early weaning of calves is a management tool that producers can implement to reduce the forage needs of the cow-calf enterprise and improve and or maintain cow condition and reproductive performance. “Early weaning” is weaning calves anytime earlier than “normal.” Calves in New Mexico are typically weaned when they are 6 to 8 months old; however, calves can be weaned as early as 6 weeks of age. Weaning at this early of an age would prove to be beneficial to reproduction. Specifically, weaning calves during the breeding season would greatly reduce the energetic demands of lactation and potentially increase the resumption of estrous in late calving cows. Nevertheless, weaning calves 30 to 90 days earlier than normal will provide more time to improve cow body condition score after weaning and prior to the subsequent calving season.

Although, early weaning is not advocated for all producers all of the time, early weaning

¹ Mathis, Clay P. and Manny Encinias. 2005. “Early Weaning Beef Calves.” NMSU Cooperative Extension, College of Agriculture and Home Economics. Guide B-126 pp1-6. http://aces.nmsu.edu/pubs/_b/welcome.html

can provide a management alternative in situations such as drought, when large amounts of purchased forage would be necessary to maintain a cowherd through normal weaning time or when cows are already too thin to rebreed. Studies at both New Mexico State University² and Oklahoma State University³ show that early-weaned calves can be efficiently raised to a normal weaning weight with minimal labor and facilities.

Why Early Weaning Works

Lactation increases the daily protein and energy requirement for a typical beef cow by 100 and 60%, respectively. Removing the calf at 6 to 8 weeks into lactation obviously reduces the quantity and quality of forage needed to maintain the cowherd. Reasons for improved rebreeding after early weaning involve more than nutrition, however. Research has shown that short-term removal of the nursing calf causes hormonal changes in the cows that stimulate estrus. Estrus activity can then be induced in cows too thin to cycle while still suckling a calf.

Managing the Early Weaned Calf

The most critical time is the first two weeks after early weaning. Calves must overcome the stress of weaning and learn to eat dry feed very quickly. The first ration should be very palatable and high in protein and energy, since the total ration consumption will at first be small. Creep feeding in the pasture prior to early weaning is helpful, but may not be feasible; however, as 6-8 week old calves don't generally eat much creep while still nursing on the cow.

At the time of early weaning, all calves should be vaccinated with a 7 or 8 way clostridial vaccine plus a modified-live vaccine for viruses associated with bovine respiratory disease. Consult a local veterinarian for other recommended vaccinations. All calves not intended for breeding replacements should be implanted. The calves should be placed in a small pen or pasture with good fences with some type of shelter available. The feed bunk and water source should be easily accessible and recognizable. A starter ration that has worked well is shown in Table 1. It may not be practical for smaller cowherds to purchase bulk quantities. Most feed mills/suppliers have high quality starter/creep rations that can be purchased in a bag, that are high in both energy and protein. In the example starter ration, cottonseed hulls are used as the sole roughage source, since they are extremely palatable. If chopped hay is substituted for cottonseed hulls, molasses should be added to minimize dust. Avoid alfalfa pellets; because calves tend to sort them from the concentrate portion of the ration, a problem that can lead to digestive upsets if too much concentrate is eaten. Soybean meal is preferred over cottonseed meal for young calves.

² Foster, L. 1996. "Cow herd nutrition during a drought." Western Beef Producers 2nd March.

³ Lusby, K. S., R. P. Wettemann, and E. J. Thurman. 1981. "Effects of early weaning calves from first-calf heifers on calf and heifer performance." J. Anim. Sci. 53:1193-1197. and Lalman, David. 1983. "Early Weaning for the Beef Herd." Oklahoma State University Cooperative Extension. ANSI-3264. 4pp.

Table 1: Starter Ration

Production Assumptions						
Number of Calves Weaned	176			Days on Feed	12	
Calf Early Wean WT	300			Rate of Gain, lbs per day	3.5	
Feed Rate, as % of body wt	2.50%			End/Market Wt	342	
Feed Rate, Avg lbs per day	8.025			(Note: Feed Rate = Weighted Avg of begin and end wt)		
Cow Herd Size (Exposed)	200					
Ration	\$/ton	% of Ration	Lbs	Cost/lb Ration	Cost/ton	
Rolled Corn	\$56.43	64.00%	1280	\$0.1782	\$28.12	
Soybean meal	\$40.00	20.00%	400	\$0.2000	\$8.00	
Cottonseed Hulls	\$40.00	10.00%	200	\$0.0700	\$4.00	
Cane Molasses	\$80.00	5.00%	100	\$0.0900	\$9.00	
Supplement	\$40.00	1.00%	20	\$0.2500	\$5.00	
		0.00%	0			
		0.00%	0			
			0			
Feed mill markup	\$50.00	NA	NA	\$0.0250	\$5.00	
Other		NA	Na			
Total Ration Cost		100.00%	2000	\$0.1931	\$86.12	
Total Ration Cost Per Head					\$8.59	
Ration Cost per pound of gain					\$4.427	
Total Pounds/Tons of Ration Fed			16948.80 Pounds	8.47 Tons		

Calves should be hand fed the starter ration until consumption reaches 4-7 lbs/head/day, depending on calf weight at time of weaning. This normally takes 10-14 days. To insure that smaller and more timid calves get a chance at feed and water, limit 20 calves per pen during the critical first few days on the starter ration. Placing one or two older calves that are accustomed to eating and drinking in with the early-weaned calves helps to reduce stress on the weaned calves. Observations have indicated that the newly weaned calves tend to follow the older calves to the feed bunk and caterers.

After 10-14 days on the starter ration, the early-weaned calves can be moved to a larger pen and switched to a "calf grower ration." Tables 2 and 3 report calf grower rations for calves placed in feedlot situation and calves fed on the ranch. Both rations are actual rations used by producers, and are often dependent on availability of commodities and not so much cost of commodity.

Table 2 and 3 estimate total other feeding cost associated with early weaning feeding program, labor, vet/med, fuel, trucking, etc. Producer should be careful not to underestimate total cost of feeding calves, on or off the ranch.

Table 2: Early Weaning Ration No. 1: Feedlot Ration

Production Assumptions	NOTE: Only Input/change BLUE values/numbers				
Number of Calves Weaned	176	Days on Feed	90		
Calf Early Wean WT	300	Rate of Gain, lbs per day	0.3		
Feed Rate, as % of body wt	3.00%	End/Market Wt	327		
Feed Rate, pounds per day	9.405	(Note: Feed Rate = Weighted Avg of begin and end wt)			
Cow Herd Size (Exposed)	200				
Ration	\$/ton	% of Ration	Lbs	Cost/lb Ration	Cost/ton
Ground Hay	\$25.00	28.00%	560	\$0.1125	\$63.00
WDG	\$5.00	58.50%	1170	\$0.0475	\$55.58
Burrs	\$0.00	12.00%	240	\$0.0350	\$8.40
Supplement/minerals	\$0.00	1.50%	30	\$0.2500	\$7.50
		0.00%	0		
		0.00%	0		
		0.00%	0		
			0		
Feed mill markup	\$0.00	NA	NA	\$0.0250	\$0.00
Other		NA	Na		
Total Ration Cost		100.00%	2000	\$0.0922	\$84.48
Total Ration Cost Per Head					\$8.07
Ration Cost per pound of gain					\$2.8916
Total Pounds/Tons of Ration Fed		148975.20 Pounds		74.49 Tons	
Other Feeding Cost	Unit	Cost/Unit	Quantity	Total	Cost Per Head
Labor	Total		100		
Water Improvements	total		1		
Vet Med/Health	Per Head	\$2.00	100	\$2,000	\$6.82
Fuel and Oil	Total		1		
Supplies	Total		1		
Trucking (feed to ranch)	Loaded Mile	\$0.00	135	\$0.40	\$3.07
Yardage per head per day		\$0.30	15840	\$4,752	\$7.00
Other					
Total Other Early Wean/Feeding Cost				\$6,492	\$6.89
Total Early Weaning Cost per Head					\$14.96
Total Early Weaning Cost per pound of gain					\$2.26
Total Early Weaning Cost per Cow					\$101.17
Total Additional Cost to Cow Herd from Early Weaning					\$20,233.10

Problems to look for during the drylot rearing of the calves, on or off the ranch include: 1) respiratory problems, especially during the first few days; 2) sorting of the ration, which can lead to digestive upsets; 3) coccidiosis and 4) scouring. If coccidiosis is felt to be a potential problem, a coccistat should be fed at the start of the early weaning period. If dust is a problem, investment in some hose and sprinklers might be necessary. Ideally, early-weaned calves are started with a ration high in energy and protein and are gradually changed to a grower-type ration as their total intake increases.

Table 3: Early Weaning Ration No. 3, Custom Feed Delivered to Ranch

Scenario 5 (Calf Ration: Inadequate Forage, Early Weaning, Calves Fed on Ranch Ration)

Production Assumptions		NOTE: Only input/change BLUE values/numbers			
Number of Calves Weaned	176	Days on Feed	90		
Calf Early Wean WT	300	Rate of Gain, lbs per day	2.6		
Feed Rate, % of body wt	3.00%	End/Market Wt	534		
Feed Rate, pounds per day	12.51	(Note: Feed Rate = Weighted Avg of begin and end wt)			
Cow Herd Size (Exposed)	200				
Ration	\$/ton	% of Ration	Lbs	Cost/lb Ration	Cost/ton
Rolled Corn	\$ 305.00	25.00%	500	\$ 0.1525	\$ 76.25
Soybean meal	\$ 243.00	20.00%	400	\$ 0.1215	\$ 48.60
Cottonseed Hulls	\$ 18.00	30.00%	600	\$ 0.1090	\$ 5.40
Cane Molasses	\$ 0.00	24.90%	498	\$ 0.0350	\$ 17.43
Supplement	\$ 975.00	0.10%	2	\$ 0.4875	\$ 0.98
	\$	0.00%	0		
	\$	0.00%	0		
	\$		0		
Feed mill markup	\$ 50.00	NA	NA	\$ 0.0250	\$ 50.00
Other	\$	NA	Na		
Total Ration Cost		100.00%	2000	\$ 0.1313	\$ 62.66
Total Ration Cost Per Head					\$ 47.86
Ration Cost per pound of gain					\$ 0.6319
Total Pounds/Tons of Ration Fed		198158.40 Pounds		99.08 Tons	
Other Feeding Cost	Unit	Cost/Unit	Quantity	Total	Cost Per Head
Labor	Total	\$ 5.00	176	\$ 880.00	\$ 5.00
Water Improvements	total	\$ 0.00	1	\$ 0.00	\$ 0.84
Vet Med/Health	Per Head	\$ 2.00	176	\$ 352.00	\$ 2.00
Fuel and Oil	Total	\$ 300.00	1	\$ 300.00	\$ 1.55
Supplies	Total	\$ 0.00	1	\$ 0.00	\$ 0.84
Trucking (feed to ranch)	Loaded Mile	\$ 0.00	135	\$ 0.00	\$ 0.07
Yardage		\$		\$	\$
Other		\$		\$	\$
Total Other Early Wean/Feeding Cost				\$ 1,092	\$ 0.30
Total Early Weaning Cost per Head					\$ 88.16
Total Early Weaning Cost per pound of gain					\$ 0.80
Total Early Weaning Cost per Cow					\$ 65.58
Total Additional Cost to Cow Herd from Early Weaning					\$ 3,115.65

Expected Calf Performance

Depending on ration and environmental factors, daily gains of commercial calves will likely average between 1.5 lbs/day to 2.0 lbs/day from 6-8 weeks of age to 205 days of age. Calves can be expected to consume 3% of their body weight, or an average of 9-10 lbs of feed/day during the early weaning period, with a feed conversion of 4.5 lbs of dry matter per pound of gain, again depending on the ration and environment. Weaning weight for early weaned calves will depend on age at early weaning weight. In our example calves weighed 300 lbs at time of early weaning. Performance of early-weaned calves compared to pasture reared calves will depend on the growth potential of the

calves, the level of milk production of the dams and the level of management.

All roughage fed to early-weaned calves should be mixed in desired portions in a complete ration. When free-choice hay is available, some calves may consume mostly hay, which provides protein, minerals and energy. By increasing the roughage level of the complete rations as the calves get bigger and thus increasing their daily ration intake, the correct levels of protein, energy and minerals can be “metered” into the calves.

Improving Reproductive Performance

The relationship between reproductive success and body condition at calving is based on energy. Cows must have energy to support all bodily activities, but some functions have a higher priority for energy use than others. Cows can only direct energy toward resuming the estrous cycle after calving if energy intake exceeds the combined requirements for maintenance, growth and lactation. Energy demands of a lactating cow can be very high. It is important that the cow is in adequate body condition at calving so that stored energy can be used to support her needs. If she does not have enough stored energy at calving, she must gain weight during lactation so that she will have enough energy to begin cycling again. However, it is difficult to cost effectively increase body condition of cows in early- to mid-lactation with supplemental feed. This is why body condition at calving is strongly related to the length of the postpartum anestrus period (time between calving and first heat) in beef cattle. Cows that are thinner at calving take longer to resume cycling after calving and are less likely to become pregnant during the breeding season⁴.

Since body condition at calving influences reproductive performance, early weaning can be utilized to improve the chance that a cow is in acceptable body condition. As previously noted, research has shown that weaning calves early can greatly lower a cow's nutrient requirements by ceasing lactation. More specifically, if the calf is weaned at 60 days of age (2 months), the cow's daily energy requirement declines by 60 percent. Reducing the nutrient requirements of lactation by weaning the calf makes early weaning an option to manage thin cows to achieve short- and long-term improvements in reproductive performance.

Pencil it Out: What makes sense?

Every ranching situation is going to be different, and the decision to early wean or not should be dependent on a careful analysis of the cost benefits of your individual situation. Early weaning is one management strategy to reduce forage demands and maintain the reproductive performance of the cowherd, and is a management decision

⁴ Mathis, Clay P., Jason E. Sawyer and Ron Parker. 2002. “Managing and Feeding Beef Cows Using Body Condition Scores.” NMSU Cooperative Extension Service, College of Agriculture and Home Economics, Circular 575, 9pp. http://aces.nmsu.edu/pubs/_b/welcome.html

that could be played out—evaluated and compared in a number of scenarios/situations, including the following:

Scenario 1: Standing forage is inadequate and the decision is to traditionally wean calves in late October. The available supply of hay and protein supplement is inadequate to meet the nutrient requirements of the cow. Cows will likely be in poor condition through the remainder of breeding season and into the fall and winter months.

Scenario 2: Standing forage is inadequate and the decision is to traditionally wean calves in late October. Adequate hay and protein is fed to the cowherd to meet her nutrient requirements in an effort to maintain reproductive performance.

Scenario 3: Standing forage is inadequate and the decision is to early wean calves July 30th and to sell as early weaned calves. Adequate hay and protein is fed to the cowherd to meet her nutrient requirements and maintain reproductive performance following weaning.

Scenario 4: Standing forage is inadequate and the decision is to early wean calves July 30th and to place calves in feedlot for approximately 90 day and market in late October. Early wean Starter and Feedlot ration, reported in Tables 1 and 2 above, could be used in this scenario. Adequate hay and protein will be fed to the cowherd to meet her nutrient requirements and maintain reproductive performance following weaning.

Scenario 5: Standing forage is inadequate and the decision is to early wean calves July 30th and to dry lot the calves on the ranch for approximately 90 day and market late October. Early wean Starter and Feedlot rations, reported in Tables 1 and 3 above, respectively, could be used in this scenario. Adequate hay and protein will be fed to the cowherd too meet her nutrient requirements and maintain reproductive performance following weaning.

Clearly the results of each of these Scenarios are dependent on the production and cost of production assumptions made. A higher ration cost for cows under Scenario 2 would quickly reduce any benefits to feed cows vs calves. The real cost not computed hear under Scenario 2 it that the cow and calves are more than likely still on the range foraging, and negatively impacting the range.

For 2014, the impact of reproductive performance, or lack thereof will most likely become evident. In Scenario 1, it is likely, depending on the condition of cows at calving in 2013, and the condition of the range; these cows will continue to struggle reproductively. The impact of not meeting the nutrient requirement of the cows while continuing to lactate on pastures with inadequate forage will likely impact the productivity of the range resources and the cow herd.

Conversely, in Scenario 2, the investment made in feed to meet the nutrient

requirement of the cow and maintain her body condition and reproductive performance will most likely pay off, but it will likely have a much greater effect on net cash flow, than early weaning and aggressively reducing the energy demand of the cow herd.

Scenario 3, 4, and 5—producer would expect a more pregnant cow in the Fall and a higher calving percentage and calf crop the following year (2014) from early-weaned cows, along with their lower wintering cost. In Scenarios 2-5, feeding to maintain cow conditions should produce more positive outcome over living through poor conception rates with underfed cows—Scenario 1. The advantage to early wean and feeding calves vs early wean and market calves right away will clearly depend on early wean weight and market price vs. the ration costs—the whole ration cost.

NOTE: The most likely place for early weaning is in a situation where poor conception rates are expected. Depending on concentrate and hay prices, early weaning might be an economically feasible alternative to purchasing large amounts of hay to maintain cow condition. Producers should substitute their own feed costs as appropriate in evaluating their early weaning decision.

This analysis was complete using the “Early wean Ration Calculator Plus.xlt” that can be downloaded at: <http://aces.nmsu.edu/drought/index.html> Producers are encouraged to input their own production, financial and marketing assumptions.