WINTER FEED NEEDS OF FALL-CALVING COWS

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Fall calving was initiated on the station to see if some of the problems that have plagued ranchers on the traditional spring calving program such as light weaning weights, poor calving weather, scours and other calfhood diseases, and long breeding seasons could be alleviated or eliminated. Fall calving has looked promising and profitable for cattlemen in many situations, particularly for those on desert range without access to high elevation forested ranges.

Calves are dropped in October and November and weaned in late July. This is an ideal calving time with cool, calm and dry weather as opposed to the wet, muddy, cold and windy conditions of February, March and April. Breeding in January and February has also proven to be beneficial in shortening the breeding season and facilitating an artificial insemination program. Cattle are in close on relatively small winter feed grounds during the breeding season as opposed to the range situation with June and July breeding.

Forage on the high desert ranges is of exceptionally high quality from late April to early July. Spring-born calves are not big enough by this time to effectively utilize this forage directly and, therefore, depend on the cow's milk. By the time the calves are mature enough to utilize the range, quality has declined substantially in both protein and energy content. The calf cannot get much from the forage at this time and the cow's milk production also has declined. The fall-born calf is large enough to efficiently utilize the early high-quality forage and with the cow still providing some milk makes rapid gains during this period. Fall calving has allowed us to leave the calves on the cows longer and still make economical gains. This has increased weaning weights by 150 to 200 pounds over the spring-born calves. The objective of the study reported here was to determine the minimal feed level necessary for wintering lactating cows and their calves, while providing for optimum production.

EXPERIMENTAL CONDITIONS

The cow herd was of Hereford breeding with approximately 100 head used on the study each year. Heifers were not assigned to the study until they had dropped their second calf. Cows were calved in October and November. Experimental rations and creep feeding was initiated around December 10 of each year. The herd was gathered each day and sorted into pens to receive their supplements. Hay was fed free choice and water, salt and a salt-bonemeal mix were available at all times. Treatments were terminated about April 10 of each year and cattle were turned out on range after that date. Calves were weaned and cows remained on range until mid-September. Cows were then brought in and put on rake-bunched hay or aftermath until the start of the trial. Cows were kept on the same treatment from year to year to study the long-term effects of the nutritional regimes. In general, the cattle were in excellent condition going onto the study each winter.

FIRST THREE YEARS' RESULTS

Most range cattle in the western United States are wintered on grass hay. This hay is adequate for maintaining pregnant cows through the winter. However, it is deficient in both protein and energy to provide for adequate gains on weaners and yearlings without a supplement. It was assumed that lactating cows and their calves would need additional protein and energy for economic production levels.

Cows were supplemented at two energy levels and with three protein sources. The low energy supplement consisted of 1.5 pounds of cottonseed meal (CSM) or its equivalent and high energy 2.5 pounds of barley, .75 pounds of CSM and .15 pounds fat or the equivalent.

Half the calves were fed a 20 percent CSM, 40 percent alfalfa and 40 percent barley creep ration free choice and others were limited to one-half of the creep consumed by the free choice group.

The additional 230 pounds of supplement fed to the cows on the high energy treatment did not improve calf gains during the winter or eventual weaning weights. The extra feed did not improve conception rates, calving interval or attrition rate (which includes all cows culled for being open, aged, prolapsed, diseased, etc.). Cows on the high energy did lose slightly less weight (13 pounds) over the winter and were 11 pounds heavier at weaning than those on low energy. Since this extra weight did not improve reproductive performance nor calf gains, it would only be of value on those cows culled and sold at that time. Taking into consideration conception rates, calving intervals, calf losses and adjusted weaning weights the low energy cows actually produced 25 pounds more calf per cow than those on high energy.

The free choice calf creep did increase adjusted weaning weights by 11 pounds, and pounds of calf produced per cow by 18 on 77 pounds of additional creep feed per calf as compared to the limit fed group. There were no interactions between creep levels and cow energy levels.

LAST SEVEN YEARS' RESULTS

Based on the results after three years, it was decided to eliminate the previous high energy cow supplement and compare the low energy to hay alone and compare free choice calf creep feeding to no creep and all the interactions. The cow treatments were a daily feed of meadow hay alone, hay plus .25 pounds of a nonprotein nitrogen (NPN) source (biuret), hay plus .19 pounds NPN and 1.23 pounds barley, and hay plus 1.46 pounds CSM. One half the calves on cows from each of the above groups received a pelleted creep consisting of 80 percent alfalfa, 13 percent barley, 5 percent molasses and 2 percent salt free choice and were compared to calves receiving no creep.

Table 1 shows that the addition of protein only in the form of NPN to the meadow hay diet did not improve calf weights and because of a slight reduction in conception rate and increase in calves lost actually produced less calf weight per cow. Feeding barley with the NPN also failed to improve calf production per cow even though adjusted weaning weights were increased slightly. The CSM treatment increased the pounds of calf produced per cow by five pounds, but this certainly would not pay for the extra feed.

Table 1. Effect of cow supplements on calf production

Treatment	Adjusted weaning weight[1/]	Calf weight produced per cow[2/]	Supplement consumed[3/]
	lbs	lbs	lbs
Hay only	476	393	0
Hay + protein (NPN)	475	377	29
Hay + NPN + barley	483	389	162
Hay + CSM	480	398	166

1/ Adjusted for sex and age of calf.

2/ Takes into consideration conception rate, calving interval, calving loss and adjusted weaning weight.

3/ Consumption over the trial period per cow.

Cows lost considerably less weight over the winter on the CSM supplement, however, by weaning they were only 7 pounds heavier than those receiving meadow hay alone. On the protein only and protein plus energy treatment, cows ended up 22 and 15 pounds lighter than those on hay alone, respectively.

Table 2 shows the effect of winter creep on calf performance. Creep feeding did increase winter average daily gains by .4 pounds, with summer gains being about the same and adjusted weaning weights of creeped calves being 53 pounds heavier. Cows with creep fed calves at their sides lost more weight over the winter and were 10 pounds lighter at weaning. Overall the pounds of calf produced per cow favored those creep fed by 48 pounds.

To produce one extra pound of calf, 7.2 pounds of creep feed were required. So to be profitable, the value of the added gain would have to be more than 7 times the cost of the creep feed plus paying for the extra labor and expense of building or buying and maintaining creep facilities. Whether creep feeding would pay depends on the price of calves in relation to the cost of creep feed. There have been many years in the past when the extra weight on creep fed calves would not cover the cost of the creep.

Table 2. The effect of winter creep on calf performance

Treatment	Total creep consumption[1]	Average daily gain winter	Average daily gain summer	Adjusted weaning weight[2]
	lbs			
No creep	0	1.12	1.80	452
Creep	345	1.54	1.82	505

1/ Creep consumption per calf over the entire winter.

2/ Adjusted for sex and age of calf.

SUMMARY AND CONCLUSIONS

The conclusions appear to be simple. Additional feed to the cows above hay alone was not beneficial and creep feeding would pay only in years of high calf prices in relation to creep feed costs. However, there is one interaction between creep feeding and cow treatment that muddles the conclusions a little bit. When calves were creep fed and cows were not supplemented, conception rates were lower and calving intervals longer than when the cows were also supplemented. This did have an effect on the amount of calf produced per cow.

Table 3 presents a summary of all treatments in terms of calf weight produced per cow and the amount of supplement required to produce an extra pound of calf weight at weaning. Under no circumstances did supplementing the cows without creeping the calves provide a benefit. In fact, in all cases the calf weight produced was actually reduced. Also adding just NPN to the hay and creeping the calves did not pay.

The profitability of the other treatments again would depend on feed costs in relation to cattle prices. Feeding the cows hay only and creeping the calves would require 8.6 pounds of creep to produce one pound of additional calf weight. This means that the one pound of calf would have to be worth about 9 times the cost of one pound of creep feed to pay for the creep. On top of this, of course, you would have the cost of the creep facility and the labor to feed. Supplementing the cows with CSM and creeping the calves lowers this figure to 7.6, but there is the additional labor and bunk cost of supplementing the cows. Feeding hay plus NPN and barley and creeping the calves required 9.2 pounds of supplement to produce an extra pound of calf. The determining factor between this treatment and the CSM would be the relative cost of feeding a NPN source and barley as compared to CSM.

So, in summary it looks like good quality meadow hay alone may be the most profitable way to winter fall calving cows and their calves. During times of high cattle prices and low feed costs, it may be profitable to

supplement the hay with both protein and energy and creep the calves or just creep the calves. Supplementing the cows without creeping the calves would not pay under any condition. These results are somewhat surprising and some of the treatments may have altered hay intake. A study will be conducted to determine the effects of these treatments on hay intake. Also, a word of caution. The conclusions are valid with good quality meadow hay or better. This means grass hay that is cut when crude protein content is at least 7 percent or better and other roughages, such as alfalfa that would be of equal quality or better. Hay cut late and containing 3 to 6 percent crude protein probably would require a supplement to adequately winter fall-calving cows. Heavier milking cows also may change results somewhat.

Table 3. Summary of all treatments (ranked in order of feed efficiency)

Treatment cow-calf	Calf weight produced per cow 1/	Supplement required for each additional pound of calf
	lbs	lbs
Hay only - no creep	375	-
Hay + CSM - creep	442	7.6
Hay only - creep	415	8.6
Hay + NPN + barley - creep	430	9.2
Hay + NPN - creep	380	74.8
Hay + NPN - no creep	367	X 2/
Hay + NPN - barley - no creep	346	X
Hay + CSM - no creep	368	X

1/ Takes into consideration conception rate, calving interval, calving loss and adjusted weaning weight.

2/ The additional supplement actually caused a loss in the pounds of calf produced.