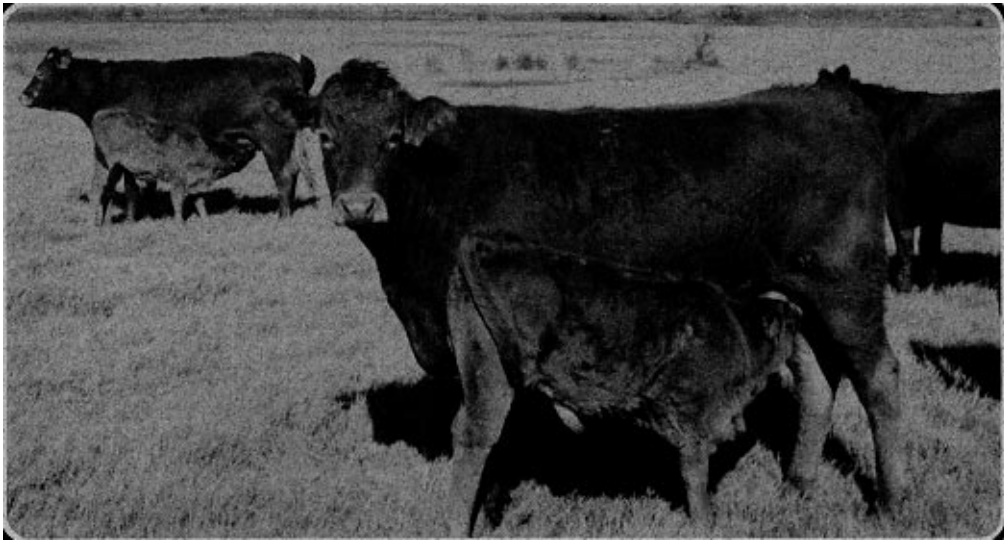


# **CREEP FEEDING BEEF CALVES**



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# CREEP FEEDING BEEF CALVES

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## Role of Creep Feeding

Creep feeding used to be thought of simply as a method of increasing weaning weights of nursing calves. Programs were limited to free-choice grain-based mixes and were often unprofitable because intakes of creep feeds could be very high and gain responses were unpredictable. We now know that creep feeds for nursing calves do not have to be fed free-choice, and we know much more about the nutrient requirements of the calf and when creep feeds are more likely to be profitable. We have learned a great deal about the use of byproduct feed ingredients and the interactions between supplemental feeds and forage utilization. We also know that creep feeding can be used as a preconditioning tool to expedite the transition from nursing calf to stocker or feeder calf. Because of this new knowledge, we can now design creep feeding programs for individual situations and do a much better job of predicting the economic outcome.

## Efficiency of Gain From Creep Feeding

The most critical consideration for a creep feeding program is the cost of **added gain**. It must be remembered that there will be a weaning weight without creep, and it is the cost of the added gain that must be calculated.

Conditions that permit heavy weaning weights without creep feed usually give poor responses to creep feeding. Why? The reason is that there are physical limits to the rate of gain a calf can achieve. If calves are already getting large quantities of milk and have abundant, high quality forage in addition to the milk, the calves will be gaining about as rapidly as their genetic ability will permit. Because creep feeding cannot significantly increase the rate of gain of rapidly growing calves, the result is that creep feed is substituted for forage and the conversion of creep feed to added weaning weight is very poor.

In general, the most efficient conversions of creep to added weaning weight will be seen when calves cannot reach weaning weights appropriate for the growth potential of the calf without supplemental feed. The best results from creep feeding are usually seen under the following conditions:

1. Forage is too mature for utilization by nursing calves. (i.e., fall, winter, and possibly late summer).
2. Forage quantity is inadequate.
3. Milk production is poor.

## Creep Feeding —

### A Complicated Supplementation Program

An efficient forage supplementation program is one that gives a large increase in **added gain** per pound of **added supplement**. This is best achieved by the supplement having a positive effect on forage utilization, usually by increasing forage intake and digestibility. Feeding protein supple-

ments to cattle grazing low protein grasses is a good example. Forage intake can be increased by as much as 30%, and digestibility can be increased by up to 10 percentage units. In this case, feeding protein balances the diet for the rumen and causes a great increase in energy — the cattle can eat more forage and get more energy from each pound eaten.

The next best situation is that of an energy supplement that does not reduce forage intake or forage digestibility, thus adding the supplemental energy on top of the energy already obtained from the forage. In the worst situation, a supplement (usually low in protein and high in starch) will cause a drastic reduction in forage intake and digestibility, resulting in little increase in total nutrients to the animal.

It is therefore necessary to understand the priorities of the nursing calf for nutrient intake. An efficient creep program must add nutrients (principally energy) to the diet, not substitute for something the calf would have otherwise eaten.

An Oklahoma study (Table 1) shows the priorities of the calf for feed sources and also shows why free-choice creep feeding can often be disappointing. In this study, crossbred calves born in January from excellent milking Hereford x Angus cows were used to study effects of free choice creep on milk intake, forage intake and gains. Calves averaged 4.2 lbs of creep from March 2 until weaning in September and weighed 40 lbs more than non creep-fed calves. The conversion of creep to added weaning weight was a disappointing 17.6:1. Analysis of forage intake and milk production data explained the poor utilization of creep feeding in this study. Calves eating creep feed consumed 11.7% less forage than non- creep-fed calves while milk intake was not affected by creep feeding.

These calves were able to gain near their genetic potential from the level of milk received from their dams and the forage available to them. When a palatable creep was offered, it was consumed at the expense of forage intake. The result was an inefficient utilization of the creep and the forage. This study points out the priorities of the calf for feed.

1. Milk
2. Palatable creep feed
3. Forage

If forage is more palatable than creep, the creep will not be consumed, but milk consumption is almost never affected by creep feeding. While many producers believe they are giving the cow some relief from nursing by feeding creep feed, research has rarely shown any reduction in suckling by feeding creep feeds. Similarly, cow weight change has rarely been affected by creep feeding.

**Table 1. Effects of free-choice creep feeding on weaning weights, forage intake, and milk intake of beef calves.**

	<i>creep</i>	<i>no creep</i>
240-day weaning weight, lbs	565	525
Daily gain, lbs	2.07	1.90
Creep intake/day	4.2	—
Lb creep/lb added gain	24.7	
Relative forage intake, %	88	100
Milk intake/day, lbs	11.4	11.1

**Table 2. Summary of 31 trials with free-choice creep feeding.**

	<i>creep</i>	<i>no creep</i>
Total gain, lbs	279	221
Daily gain, lbs	1.83	1.45
Total creep/calf, lbs	524	—
Lb creep/lb added gain	9.0	—

Because the nursing calf has three potential sources of nutrients (milk, forage, and creep), it should not be surprising that creep feeding is an extremely variable supplementation practice. In fact, free-choice creep feeding is rarely efficient. A summary of 31 university trials involving free-choice creep feeds (Table 2) shows a conversion of 9 lbs of creep per pound of added gain. Feed would need to be cheap and/or calf prices high for this conversion to be cost effective. The other problem of excessive fleshing of creep-fed calves adds to the economic problems by reducing the value of the creep-fed calves and potentially damaging milking ability of overly fed heifers kept for breeding replacements.

### **Formulating free-choice creep feeds**

Intake of free-choice creep feeds will range from about 1 lb/day when calves are just starting to consume mixed feed up to as much as 10 lbs/day when calves are near weaning age. Calves usually begin to eat creep feeds when they are about two months of age. Fall-born calves on dormant pasture may eat creep feed at an earlier age than spring-born calves on lush summer pastures. Therefore, creep feeds designed for free-choice consumption must be a compromise between high levels of protein and energy and safety since calves have the opportunity to eat large quantities.

Acidosis caused by overeating of grain or other high-starch feeds, is the major danger of feeding free-choice creep feeds. However, the danger can be minimized by ensuring that creep formulations contain some roughage products. For years, oats have been a favorite ingredient in creep feeds because oats contain enough fiber that they can safely be consumed as the sole ingredient in a creep feed. When grains are used in creep feeds, roughage products like alfalfa are typically used to ensure safety. Recent trends toward using low-starch, high digestible-fiber ingredients like soybean hulls, corn gluten feed, and wheat middlings in creep feeds have also minimized the danger from acidosis.

Free-choice creep feeds should contain from 14 to 16% crude protein in most situations. The protein should be from all natural sources because young calves do not utilize NPN sources like urea very well.

High-quality forages like wheat pasture can be efficient sources of creep feed for nursing calves. These are often referred to as **green creeps**. For an excellent discussion of the use of wheat pasture as creep feed for calves and as supplemental protein and energy sources for grazing cows, the reader is encouraged to read *OSU Circular E-916 Managing the Cowherd on Wheat Pasture*.

### **Limit-fed creep feeding**

Researchers at several universities have looked at ways to make creep feeding more economically viable. With a better understanding of the prin-

ciples of supplementation, limit feeding of creeps has emerged as an alternative. With specific attention to correcting nutrient deficiencies and maintaining forage intake of the nursing calf, results have been encouraging.

A study conducted at Oklahoma State (Table 3) compared performance of spring-born calves fed no creep, limit-fed high protein creep (cottonseed meal), or free-choice 15% protein creep. Calves fed the free-choice creep gained 79 lbs more than controls with a conversion of 7.8 lbs creep per pound of added gain. This conversion is very similar to the average reported by Kuhl (1984). Notice, however, that calves fed cottonseed meal limited to 1.0 lb/day consumption with 10% salt gained 30 lbs more than controls with a conversion of 3.3 lbs creep per pound of added gain. This level of efficiency indicates that the cottonseed meal was increasing forage intake by the nursing calves. Note that cow weight change was not significantly affected by creep feeding.

Similar results were seen in three subsequent studies at the Oklahoma station. Louisiana workers (Wyatt, et al., 1986) compared 1.0 lb of cottonseed meal creep with and without Bovatec (120 mg/lb) fed to calves of fall calving cows. All cattle grazed Dallisgrass-Bermuda pastures and were fed round bales of grass hay from Feb. 26 to May 21. Intakes of creep were maintained at 1.0 lb/day by adding an average of 8% salt to the cottonseed meal treatment and 4.3% salt to the cottonseed meal-Bovatec treatment. Calves receiving the cottonseed meal creep gained 27 lbs (.32 lb/day) more than controls. No advantage was seen for adding Bovatec to the creep feed.

Kansas researchers have conducted several trials with limit-fed creeps consisting of lower protein formulations. In one trial (Table 4), conducted beginning in mid-August, a 16% protein creep feed with 50 mg/lb Rumensin was offered the last 85 days before weaning. Creep intakes were limited to 1.5 lbs/

**Table 3. Effects of protein or grain creep on cow and calf performance (Oklahoma).**

	<i>Control</i>	<i>Protein Creep</i>	<i>Grain Creep</i>
Number of Calves	15	14	15
Initial calf wt, lbs	201	205	200
Calf gain (6/4 - 10/15)	230	260	309
Creep/calf, lbs (133 days)	—	99	614
Lb creep/lb added gain	—	3.3	7.8
Cow weight change (6/4 - 10/15)	101	88	89

**Table 4. Effects of limit-fed 16% protein creep on calf gains (Kansas).**

	<i>Limit-creep + Rumensin</i>	<i>Control</i>
Number of calves	31	27
Initial wt, lbs	308	290
Daily gain, lbs	1.84	1.53
Daily creep intake, lbs	1.46	
Creep/added gain	4.4	

day with salt. Calves consuming the limit-fed creep gained .31 lb/head daily faster and required 4.4 lbs creep per pound of added gain.

### **Carryover effects of limited creep feeding on postweaning calf performance**

A second Kansas trial (Table 5) compared limit-fed 16% protein creep (1.4 lbs/head/day) with and without Bovatec (68 mg/lb). During the 63 days before weaning, calves fed limit-fed creep gained .26 lb/day more than controls. No advantage was seen for the ionophore during the creep feeding phase. At weaning, calves were shipped 100 miles to a growing lot where they were fed for 50 days. Calves fed limit-fed creep lost significantly more weight than either Controls or calves fed creep with Bovatec during shipment to the growing lot. Gains of calves previously fed limit-fed creep were greater than for non creep-fed calves during the 50 day growing period. This would suggest some positive carry over effect of creep feeding to the start of drylot feeding.

Perhaps the best data on using limit-fed creep feeding as a preconditioning tool is found from Florida researchers. In fact, theirs is probably the first using limit-fed creep feed. A summary of four trials conducted at the Belle Glade Experiment Station (Pate, 1981) is shown in Table 6. Because the primary interest in limited creep feeding was its feasibility as a preconditioning tool, the creep period only included a period of two weeks before weaning. Limit-fed creep calves were fed from .5 to 1.0 lb of a 14% protein creep composed of corn, molasses, citrus pulp, and cottonseed meal. After weaning, both control and creep-fed calves were fed equal amounts of concentrate supplements while grazing St. Augustine grass pasture. Over the four trials, limit creep calves gained an average of 10 lbs more during the four week postweaning period. The authors suggested that since there was little difference in feed intake immediately following weaning, the added gain may have been derived from better adaptation of the digestive system to concentrate feeding after weaning rather than "teaching the calves to eat."

In a subsequent study, the Florida workers (Pate, 1981), in cooperation with a U.S. Sugar Corporation ranch, creep-fed about half of 217 calves for 21 days before weaning (Table 7). Intake of the creep was slightly over one lb /day with most calves observed to be eating. After weaning, calves were offered concentrate free-choice until intake reached 10 lbs/head/day and grazed for 35

**Table 5. Limit-fed 16% protein creep with or without Bovatec (Kansas).**

	<i>Control</i>	<i>Limit-fed Creep</i>	<i>Limit-fed Creep + Bovatec</i>
<b>Preweaning (63 days)</b>			
Number of calves	57	60	57
Initial wt, lbs	374	373	373
Daily gain, lbs	1.16	1.42	1.42
Lb creep/lb added gain	—	5.5	5.2
<b>Postweaning (50 days)</b>			
Shipping loss, lbs	11.7	19.8	11.0
Daily gain, lbs	2.09	2.29	2.33
Treatment days/calf	3.2	2.6	2.7

**Table 6. Postweaning gains of limited creep and non-creep-fed calves (Florida).**

	<i>Control</i>	<i>Limit-fed Creep</i>
Number of calves (4 years)	124	135
Weaning weight, lbs	480	490
Gain 4 weeks postweaning	3	13

**Table 7. Effects of 21 days of limited creep feeding on postweaning growing performance of ranch-raised calves (Florida).**

	<i>Control</i>	<i>Limit-fed Creep</i>
Number of calves	115	102
Weaning weights, lbs	423	423
Concentrate intake/day		
first 7 days postweaning, lbs	.9	3.3
Weight gains postweaning, lbs		
0-35 days	41	61
35-75 days	70	73
Total 75 days	111	134

days. In contrast to the Belle Glade study, no attempt was made to equalize intake between the two groups. After 35 days, supplementation was discontinued, and all calves were grazed for another 40 days. After 35 days, calves that had been creep-fed had gained 20 lbs more than previously non-creep-fed calves. During the following 40 days of grazing, there was little difference in calf gains. Previously creep-fed calves ate 3.3 lbs/head/day of concentrate during the first 7 days after weaning compared to .9 lb for non-creep-fed calves, again suggesting that creep feeding may have “taught” these calves to eat mixed feed more quickly.

#### **Limit-fed vs. free-choice creep for calves on fescue**

It is estimated that Oklahoma has about one million acres of fescue. Hence, a large number of calves will be raised on this cool-season forage rather than on warm season forages where most creep feeding research has been conducted. An Illinois study looked at limit vs. free-choice creep feeds for calves on fescue and also looked at calf performance when the creep feeds were formulated from ingredients containing digestible fiber as well as grains. Finally, the carryover effects of calf creeps on subsequent feedlot performance were studied. Three groups of spring-calving cows grazed fescue pastures (13% protein) from June 20 to October 11 and were fed according to the following:

1. no creep (Control)
2. 2 lbs/day of corn or soybean hulls limit-fed with 11% salt
3. free-choice creep made from corn or soybean hulls.

During the nursing phase, calves fed 2 lbs/day of limited creep gained 39% faster than controls. Free-choice creeped calves ate about 5 lbs/day but gained

only 13% more than limit-creeped calves. Forage intake decreased as the level of creep feed increased. Performance was equal for corn and soyhulls. During a 77-day growing period following weaning, calves that had been creeped ate more feed and gained faster than controls. It appeared that calves creep-fed with corn adapted more quickly to the corn and corn silage growing ration than calves creep-fed with soyhulls.

During the 167-day finishing period, calves that had been creep-fed tended to gain slower, eat more feed and have slightly poorer feed conversions than control calves. When the 77-day growing and 167-day finishing period were combined, there were no differences in gain or efficiency as a result of level or type of creep feed. However, creep-fed calves were fatter and had higher quality grades than control calves. Calves creep fed with corn had higher quality grades than calves creeped with soyhulls. It was concluded that creep feeding can enable more steers to achieve choice grade at a young (14 months) age and that a digestible fiber source can replace corn as an ingredient in creep feeds.

### **Creep feeding replacement heifers**

It is well established that heifers that are fat at weaning age may deposit fat in their udders and have reduced milk production potential. The overfeeding can occur from creep feed, heavy milk production of the dam or both. The proper use of creep feeding with heifer calves that will be retained as breeding replacements should be to ensure that the heifers reach weaning age at the ideal body condition and weight. Creep feed in itself will not be harmful, and in fact can be beneficial if the practice helps maintain a good growth rate up to weaning age. Only overfeeding of creep feeds resulting in obese females is harmful.

## **Summary**

Advantages of Limited creep feeding can include

1. Conversions of creep to added gain are improved over what is expected from ad libitum creep feeding.
2. Labor and the amount of feed handled are greatly reduced.
3. Calves are not fattened sufficiently to have any great impact on sale price/lb.
4. The increased weaning weight from limited creep feeding is usually no more than 30 lbs, not enough to have much negative impact on subsequent feeding performance.
5. Because of efficient conversions of creep to added gain, the practice of limited creep feeding is frequently profitable by itself.
6. Calves learn to eat mixed feed, and research suggests that performance during the early stages of postweaning feeding can be improved.

There are, however, problems with management of limited creep feeding programs:

1. Calves must eat the creep feed. Both Kansas and Oklahoma researchers have encountered problems in getting calves to eat the creep feed. Some producer education is required to ensure proper placement of creep feeding stations and proper formulation of feeds. Calves are very sensitive to the taste of salt and much less is required to limit intake than is needed with cows. Salt levels of 5 to 10% are maximums in most cases. Calves should be started on creep without salt and the salt level adjusted as needed to hold



- intake within desired ranges - usually 1.0 lb/head/day for high protein creeps, and 1.5-3.0 lbs/head/day for medium to low protein formulations.
2. For significant added weaning weight (20 lbs or more), the creep needs to be fed for a period of over 60 days. Benefits from feeding only two or three weeks preweaning must come from improved postweaning performance.
  3. Although more research is needed on carryover effects of limited creep feeding on postweaning performance, available research suggests that limited creep feeding can accomplish much of what full creep feeding could have done in training calves to eat. For full advantage, ionophores or coccidiostats may need to be included in the creep feeds, especially just prior to the stress of weaning.

Research has generally shown that advantages from preconditioning are from less sickness and greater gains during the early phase following weaning. Further, a full preconditioning program can require substantial purchases of feed. If calves make good gains during preconditioning, subsequent gains during the following grazing and finishing period may be reduced. Limited creep feeding may obtain many of the benefits of feeding during preconditioning while greatly reducing the amount and cost of feeding involved. The rancher must, however, be in a situation that permits management of a creep feeding program.

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