

# Creep Feeding Beef Calves

Shane Gadberry, Ph.D.  
Associate Professor -  
Animal Science

The performance of a calf is dictated by three basic concepts: 1) level of intake, 2) digestibility of the diet and 3) how much of the diet is retained as body weight gain. During the first few months of a calf's life, 50 to 100 percent of the calf's nutrient intake comes from milk (Figure 1). From three months of age until weaning, the cow's milk production begins to decline, yet the calf's nutrient demand is increasing. During this period, forages become a major component of the calf's diet, and forage intake and digestibility will have a large impact on the pre-weaning weight gain of the calf. Since the energy content of forage is less than milk, body weight gain declines during the transition from a milk to a forage diet. At this time, cattle producers may choose to adopt creep feeding as a nutritional intervention practice. The goal of creep feeding is to partially replace forages with more

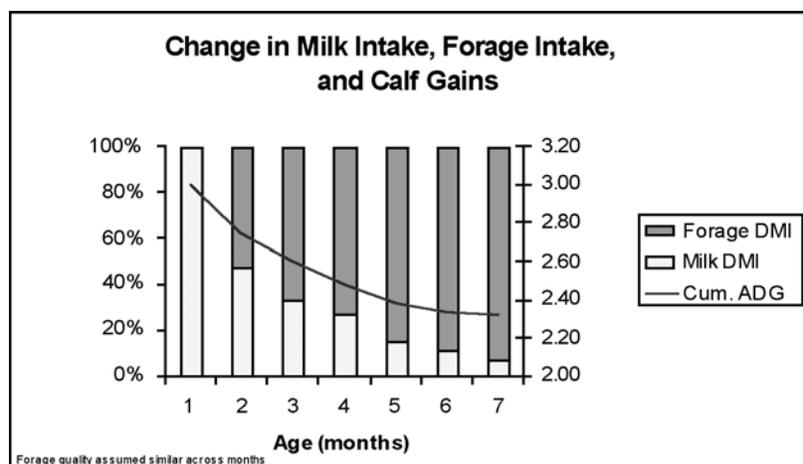
nutrient-dense feedstuffs or to provide supplemental protein to improve the digestibility and intake of low-protein forages.

## Creep Feeding on Fescue

Creep feeding beef calves on toxic, endophyte-infected tall fescue can successfully add additional weight to calves by weaning time. Fall-born calves will typically consume fescue from February through May. While fescue has the potential to be high in quality during the early part of this period, the negative effects of toxins produced by the fungus within the plant may negatively affect intake and animal performance. Similarly, spring-born calves raised on fescue would begin relying more on forages during summer months when fescue quality and quantity are declining and fescue toxicosis is occurring.

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Studies with creep feeding calves on high-quality (vegetative) fescue suggest that energy supplementation may be more beneficial than protein supplementation. Researchers in Illinois have evaluated the impact of creep feeding calves on fescue from 28 to 84 days prior to weaning. Increasing creep feeding days from 28 to 84 increases weight gain. Creep feeding for 56 days (about 2 months prior to weaning) may provide a better feed conversion than creep feeding for 28 or 84 days. Calves offered free-choice creep feed in the study for 56 days gained 0.75 pound more per day than those not consuming creep feed, and 5 to 7 pounds of creep feed were required to put on each additional pound of weight gained when using a predominately corn-based creep feed. A second study evaluated the effects of supplying limited (by adding 11 to 15 percent salt) or unlimited soybean hull or corn as a creep feed. Creep feeding increased gains by nearly 50 percent with no difference due to source of creep feed. Feed conversion did not differ between limited or unlimited creep feeding or creep source. Overall, creep-fed calves gained 0.70 pound per day more than calves not receiving creep feed, and 6 pounds of creep feed were required for each additional pound of weight gain.

## **Creep Feeding on Ryegrass**

Research at the University of Arkansas Southeast Research and Extension Center compared non-creep-fed calves to soybean hull- or corn-based creep-fed calves. Creep feeding began 90 days before calving and was targeted for a 1 percent body weight intake. These were fall-born calves, and creep feeding occurred from February to May. Creep intake was highly variable among pastures, and calves that were provided creep feed did not gain more weight than nonsupplemented calves. During creep feeding, ryegrass was abundant and of very good quality (21 to 29 percent crude protein). This research indicates that creep feeding is not economically feasible when calves have access to high-quality forage.

## **Creep Feeding on Bermudagrass**

Creep feeding beef calves on bermudagrass has the potential to add additional body weight gain for spring-born calves. Performance of growing cattle grazing bermudagrass diminishes beginning in July. Dry conditions of July and August result in limited plant growth, and the high fiber content of bermudagrass can negatively affect intake and digestibility.

Research in Oklahoma during the early '70s demonstrated that calves provided free-choice access to an 18 percent protein creep feed for 83 days were 14 percent heavier (60 pounds) at weaning than calves that did not receive creep feed. It required 9.4 pounds of feed to put on 1 pound of weight gain. Researchers noted that these calves appeared fleshier than calves that were not creep fed. The calves had a higher rate of gain during the first 28 to 54 days on creep feed. While the study did not compare timing of supplementation, this weight gain pattern observed may indicate that creep-feeding on bermudagrass to no more than 56 days may be more beneficial, as is the case with tall fescue. This may also help prevent calves from becoming fleshy.

Research at the University of Arkansas Southwest Research and Extension Center in 2008 reported a creep feed conversion of 4.3 to 4.5:1 with either a soybean hull- or corn-based creep feed formulated to contain 15 percent protein (dry matter basis) and fortified with monensin.

## **Limit-Feeding**

Limiting creep feed intake can be achieved by adding 5 to 10 percent salt. Limiting feed results in a lower total weight gain; however, the amount of supplemental feed per pound of added weight gain is reduced, making this a cost-effective decision. Calves should be started on creep without salt, and salt gradually added until the desired level of creep intake is acquired (1 pound, high protein meals or 3 pounds, moderate protein). The desired level of protein supplementation on improved forage pastures may be influenced by fertilization practices. When grazing improved forages that have been fertilized with nitrogen according to soil test recommendations, moderate levels of protein and higher rates of energy intake may be preferred in the creep supplement. However, if nitrogen fertilizer is not being applied to pastures, higher-protein creep feeds can result in improved forage intake and digestibility, resulting in better feed efficiency in comparison to moderate-protein, high-energy creep feeds.

## **Creep Feeding Replacement Heifers**

Creep feeding replacement heifers may be detrimental to their milking ability as cows. From three to ten months of age, the mammary system is developing at a faster rate than the rest of the body. High nutrient intake during this period negatively impacts mammary development. Research with

heifers offered free-choice access to creep feed demonstrated significantly lower milk production as first-calf heifers in one of two Illinois trials and numerically lower milk production in a second trial when compared to first-calf heifers that were not creep fed. Calf performance suffered because of lowered milk production in the first trial. In the second trial, body condition score was less than desirable for heifers at breeding, calving and weaning, which may have caused a greater variation in results. At breeding, heifers in trial two that were creep fed were in better body condition, and as a result, the creep-fed heifers tended to have a greater pregnancy rate. This demonstrates the importance of having heifers in adequate body condition to reach puberty by the breeding season, and carryover body weight from creep feeding may be beneficial under instances that result in lower post-weaning performance.

## Using Growth-Promoting Feed Additives

Ionophores added to creep feed can improve average daily gain as a result of better feed conversion. Ionophores change the rumen bacteria population, resulting in a reduction of energy losses associated with fermentation by-products. Reported performance results with ionophores have been variable. This variation in response can be attributed to factors such as level of ionophore supplementation, level of creep intake and forage digestibility. In general, ionophores are more effective when diet quality is greater.

## Lifelong Effects of Creep Feeding

It has been hypothesized that early-life (preweaning) nutrition can have long-term effects, including improving carcass quality grade. A collaborative research project between the University of Arkansas and the USDA, Agriculture Research Service Southern Plains Range Research Station examined lifelong effects of feeding corn- or soybean hull-based creep feeding. The studies were conducted on predominately bermudagrass, ryegrass or native rangeland. In all instances, creep feeding did not improve carcass quality grade. In all cases where carcass quality grade has been evaluated, creep feeding has not shown an improvement in quality grade, with the exception of one study that measured an improvement in quality grade among calves that had been creep fed on endophyte-infected fescue.

However, another study that creep fed calves on endophyte-infected fescue did not find a significant improvement in quality grade. Most of the benefit of creep feeding calves nursing mature cows appears to be associated with increased weaning weight in an environment where forage quality or quantity is most likely to limit calf performance. This weight advantage may be measurable at feedlot entry or even slightly greater carcass weights; however, realizing an economic return to creep feeding will most likely occur when marketing these calves at weaning.

## Economics of Creep Feeding

Economics of creep feeding must be considered. Commercial cattle producers must evaluate the cost of feeding against the value of the additional body weight gain. Generally, producers may use a feed conversion of 10 pounds feed per pound of body weight gain. This makes the math easily calculated. For example, if 550-pound calves are selling for \$1.20 per pound, then 10 additional pounds of body weight would be worth \$12. If the feed conversion (10) is multiplied by the amount of weight (10), this equals 100 pounds feed for 10 pounds gain. Therefore, if the feed costs \$8 per cwt and the added value is \$12 per cwt, then creep feeding would return approximately \$4 per calf at a 10:1 feed conversion. Factors to consider about the economics of creep feeding include:

- 1) Access to lower-quality forages or forages that affect intake may result in a better creep feed conversion than demonstrated above. However, if creep feeding appears profitable using a 10:1 conversion, then returns will be greater if actual feed conversions are less than 10:1.
- 2) Access to higher-quality forages such as cool-season annuals, nontoxic infected fescue and legumes may result in a poor supplemental feed conversion. If the margin appears narrow when figuring a 10:1 feed conversion, then it is likely that creep feeding will result in a negative return or break-even under best case scenarios.
- 3) Supplementation that results in large amounts of additional body weight gain may result in cattle receiving a lower price per pound (price slide), but this often results in more gross income.
- 4) Calves that become too fleshy or fat may be discounted at marketing. Market survey data has demonstrated a \$6 to \$16 per cwt discount for fleshy and fat calves.

Additional management considerations for determining whether to creep feed include:

- 1) Creep feeding will not alleviate nutrient demands for the nursing cow. Calves will still nurse the cow. Creep feeding may alleviate some grazing pressure; however, the forage dry matter intake of a calf is less than half of the intake required by the dam. As a result, early weaning may be more beneficial than creep feeding during drought conditions.
- 2) Creep feeding exposes calves to eating from a bunk and concentrate-type feedstuffs. This exposure may be beneficial in adapting weaned calves to a new environment where they will be partially or fully fed from a feed bunk.
- 3) Creep feeding may be beneficial to purebred cattle producers who must meet cattle weight and gain requirements to participate in production sales.

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**DR. SHANE GADBERRY** is associate professor - animal science with the Department of Animal Science, University of Arkansas Division of Agriculture, Little Rock.

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FSA3107-PD-6-12RV