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"Beef Production Strategies" article

Creep Supplementation Decisions

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Creep Supplementation

Milk production in beef females typically peaks about two months after calving. Milk from a lactating beef cow furnishes only about 50 percent of the nutrients that a 3 to 4 month-old calf needs for maximum growth. For calves to perform to their genetic potential, additional nutrients are needed. Low pasture nutrient quality (most common in late summer) or quantity (often seen in winter or during drought conditions) will not provide enough additional nutrients to meet calf needs for maximum growth.

Pre-weaning supplementation or "creep feeding" provides additional nutrients to nursing beef calves beyond the nutrients supplied by dams' milk and forage available to cow-calf pairs. Creep supplementation can include feeding concentrate feed supplements or grazing high quality forage. High quality grazing is usually the most economical source of additional nutrients for nursing calves. While many warm-season grasses in Mississippi pastures are often plentiful in quantity, they do not maximize calf gains even when considered high quality for the forage species. For example, both average daily gain and weaning weights increase for calves with access to legume creep grazing on both high quality bermudagrass pastures, indicating a need for supplemental high-quality feed for calves before weaning.

Creep Feedstuffs

A variety of different feedstuffs and feedstuff combinations are suitable for creep supplementation of beef calves. When selecting feedstuffs for creep diets, consider forage conditions and milking levels of herd females to determine which feedstuffs may provide the most benefit to calves. Take feedstuff nutrient content, price, and handling characteristics into account as well. In creep feeding situations, calves often have free access to supplement. Commonly used feedstuffs for creep supplement in Mississippi include soybean hull pellets, corn gluten feed, corn, soybean meal, cottonseed meal, and commercially mixed creep supplements containing multiple ingredients. Only use cottonseed meal for creep feeding calves over 4 months of age.

Creep feedstuffs must be palatable to calves. Whole or rolled grains generally are more palatable than finely-ground grains. Larger feed particle sizes reduce dust and may decrease wastage. Adding cane molasses to creep rations (3 to 5 pounds of molasses per 100 pounds of creep feed or 60 to 100 pounds of molasses per ton of creep feed) decreases dust problems, increases feed palatability, and reduces feedstuff separation. When calves have access to adequate milk and high quality forage, it may be difficult to start calves on creep feed. To encourage creep feed intake, offer creep supplement in areas the herd often visits. Feeding the herd small amounts of feed a few days prior to

the beginning of creep feeding is a good training method because calves quickly learn to eat with their dams. Scattering feed or hay around and through the creeping area so that the cows will loiter nearby. When pastures are large, consider using multiple creep feeders.

It is important to provide feedstuffs to calves that will not cause digestive disturbances when fed free-choice. Calves consuming large quantities of starch from grain-based creep feeds may experience acidosis. When providing free-choice creep supplement to calves, maintain a continuous supply of feed in creep feeders. Allowing creep feeders to become empty before refilling can result in calves overeating creep supplement when feeders are refilled. Make sure that feed containing multiple ingredients are thoroughly mixed to reduce feed sorting by calves.

It is possible to limit intake of feedstuffs by supplying creep feeders on a daily basis, but this is a very labor intensive method of feeding. Salt can also be used to limit creep feed intake. Young calves are very sensitive to salt and will respond quickly to changes in salt levels, so gradual increases in salt levels should be used. A creep feed supplement should contain approximately 8 to 10 percent salt, but it may be necessary to initially include only 2 to 3 percent salt to encourage calves to eat the supplement. Frequently monitor creep feed intake and adjust salt levels as needed. Intake may need to be controlled by adding more salt or hand feeding defined quantities of feed if it begins to exceed 1.5 percent of body weight. Limiting intake of high protein creep supplements will reduce calf weight gains by about one-third to one-half as much added gain compared with unlimited creep feeding. Meal forms of creep supplement are more suitable to mixing with salt than pelleted forms. In addition, remember that salt can corrode metal creep feeders but works well in wood, plastic, or rubber feeders.

A limit-fed creep feeding system can increase the efficiency of feed conversion and prevent calves from becoming overly fleshy. One possible strategy is to limit feed either about 1 pound per day of a protein creep feed or about 3 pounds per day of an energy creep feed. Intake of a high protein creep feed should be limited to about 1 pound per day to capitalize on the favorable effects on forage digestibility and intake without protein being used for energy and resulting in lower creep feed efficiency.

Creep Forages

Forages are important for proper calf digestive tract development. Functional rumen development starts as soon as calves consume roughage from forages or high-roughage feedstuffs such as cottonseed hulls. Nursing calves begin ruminating at about three months of age when consuming roughage. The rumen develops considerably slower when only milk and concentrate feeds are consumed.

Calf gains from creep grazing are often similar to or slightly less than gains from grain-based creep programs. To implement creep grazing, plant small acreages of high quality forage adjacent to pastures grazed by cow-calf pairs. Forages well suited for use in a creep grazing system should be high in forage quality and readily available.

In Mississippi, annual ryegrass is a forage commonly used for creep grazing. Other lush cool-season forages such as cereal rye, wheat, and oats and non-toxic endophyte-infected tall fescue may work well in creep grazing management systems. Legumes such as clovers and alfalfa are also good potential forages for inclusion in a creep grazing paddock. Annual grasses such as sorghum-sudan and pearl millet provide creep grazing options during the warm season and can be initially stocked at 6 to 10 head per acre. The high-quality warm-season forage forb, chicory, is another creep grazing option as is aeschynomene, a high quality tropical legume.

Creep Supplement Intake and Efficiency

The supplemental feed efficiency (pounds of feed consumed per pound of calf weight gain) of creep feeding typically is relatively poor but varies widely according to creep feed composition and total calf diet. For calves raised in production conditions that support high weaning weights (such as on high quality, abundant forage), creep supplementation response is often poor. Supplemental feed efficiency can range from 4:1 to 18:1. In most cases, the conversion is greater than 8 pounds (often averaging 9 to 10 pounds) of feed per additional pound of gain beyond non-creep fed calves when using concentrate-based creep feeds. The use of ionophores (e.g., monensin and lasalocid) can improve creep feeding efficiency. Growth-promoting implants are also available for use in nursing calves and can change the economics of creep supplementation.

Most calves nurse to capacity before consuming creep feed or forage. They generally prefer milk over palatable creep feed and forage. Calves will also substitute creep feed for forage when given the opportunity. When using a grain-based creep feed, milk intake is not affected by the level of creep feed intake, but forage intake declines as creep feed intake increases.

While high energy creep feeds can decrease forage digestibility and intake, high protein creep feeds can increase forage digestibility and intake. Soybean hulls are an exception to this. They contain high energy levels and high levels of very digestible fiber. Fiber-based creep supplementation using primarily soybean hulls can be used without negative effects on intake and digestion in nursing calves. Limiting the quantity of high energy creep feed intake can also partially offset decreases in fiber digestion.

Feed efficiency may improve when using high protein supplements (>20 percent protein) compared to high energy low protein grains and by-product feeds. This occurs with both limited and unlimited creep feeding. Calf average daily gains typically rise as protein level in the diet increased.

Creep Feeding Economics

The cost of creep supplementation per pound of gain depends upon the cost of creep feed and calf feed conversion (Table 1). The value of improvements in calf gains and marketability needs to offset the cost of supplementation for creep feeding to be profitable. The value of additional calf weight gains often declines per pound as

commercial calf weights increase (price slide). In addition, with higher calf prices, greater discounts are often assessed as calves increase in weight. Depending on the creep feeding program, overly fleshy calves may result from creep supplementation. Some markets discriminate against calves with excess condition, lowering the value of added gains from creep supplementation that results in fleshy calves.

Table 1. Cost of creep supplementation per pound of gain.

Feed conversion, pounds of extra feed per pound of extra gain	Cost of creep feed, $ per ton						
	$125	$150	$175	$200	$225	$250	$275
	Cost of creep supplementation, $ per pound of gain						
4	0.25	0.30	0.35	0.40	0.45	0.50	0.55
5	0.31	0.38	0.44	0.50	0.56	0.63	0.69
6	0.38	0.45	0.53	0.60	0.68	0.75	0.83
7	0.44	0.53	0.61	0.70	0.79	0.88	0.96
8	0.50	0.60	0.70	0.80	0.90	1.00	1.10
9	0.56	0.68	0.79	0.90	1.01	1.13	1.24
10	0.63	0.75	0.88	1.00	1.13	1.25	1.38
11	0.69	0.83	0.96	1.10	1.24	1.38	1.51
12	0.75	0.90	1.05	1.20	1.35	1.50	1.65
13	0.81	0.98	1.14	1.30	1.46	1.63	1.79

In making an informed decision about pre-weaning supplementation, consider several factors. Forage conditions, milk production levels, calf growth potentials, post-weaning marketing plans, feed costs, forage costs, pasture carrying capacity, calf prices, and price differentials for calves of varying body condition impact creep feeding profitability. For more information on creep supplementation or related topics, contact a local office of the Mississippi State University Extension Service.