

THE DIGESTIVE TRACT

Improve nutritional status to add value to calves

by Dan Shike, University of Illinois



Several factors affect the profitability of cow-calf operations. Managing cow feed costs and maximizing reproductive efficiency and longevity of the cow herd are critical components. At the end of the

day for most cow-calf operations, however, the income is generated by the sale of feeder calves.

With more than 70% of calves born in the spring, there is no lack of supply of feeder calves in the fall. Developing a plan for maximizing value of feeder calves is essential to success.

Weaning strategies, vaccination protocols, backgrounding and preconditioning programs all contribute to feeder-calf value. Nutritional status of calves can significantly affect future feedlot performance and final carcass value. Producers who manage the nutritional status of calves and have a plan for marketing and capturing value from improved nutritional status have an opportunity to add value to their feeder calves.

Situational

One of the challenges for cow-calf producers is trying to determine what practices and strategies they can implement that will add more value than they do costs. Unfortunately, this isn't always easy to determine. It can vary greatly across operations and years. Prior to deciding the best practices for your operation, you should:

- ▶ identify your target market;
- ▶ assess the current nutritional status of the calves;
- ▶ evaluate available feedstuffs and prices; and
- ▶ consider current feeder-cattle prices.

If calves are going to go into a backgrounding program where they will graze and have a low to moderate plane of nutrition, calves should be managed differently than heavier calves that will go directly to the feedyard.

If you are in a drought situation and calves are lighter

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PHOTO BY SHAUNA HERMEL

and thinner than normal, you may still be able to add weight and flesh without calves becoming too “fleshy,” even if they are likely going to graze in a backgrounding operation.

Producers who have home-raised feedstuffs or access to competitively priced alternative feeds have greater opportunity for adding value to calves without completely offsetting that added value in feed costs.

High calf prices certainly can shift the economics in favor of adding pounds, especially when producers are able to keep feed costs competitive.

Improving the nutritional status of feeder calves prior to sale and shipping can improve the calves' ability to handle stress associated with shipping, commingling and disease exposure. Energy intake is typically the first limiting factor

related to weight gain, and energy deficiency can depress the immune system. Additionally, calves trained to eat from a bunk that have been introduced to concentrate feeds are less susceptible to digestive disorders and will transition to finishing rations more quickly.

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Option 1: Creep-feeding

Cow-calf operators have two options when it comes to improving the nutritional status of their feeder calves: creep-feed or wean and precondition calves.

Mature beef cows reach peak lactation at around 60-80 days of lactation. As cow milk production decreases throughout lactation, calf requirements continue to increase. As the Angus breed continues to improve genetics for growth, the likelihood of calves not having adequate nutrition prior to weaning increases.

Angus growth genetics continue on an upward trend line. However, actual on-farm weaning weights have not followed the same trajectory. This is most easily explained by inadequate nutrition (forage availability or milk production) to support the genetic potential for growth. Creep-feeding can alleviate nutrient deficiencies associated with forage shortages.

Creep-feeding for two to four weeks prior to weaning introduces calves to feed and aids in the weaning process. Creep-feeding for longer durations should be considered during drought conditions or with first-calf heifers.

Creep-feeding returns in grazing systems vary depending on forage availability and quality, as well as duration, costs of the creep feed and feeder-cattle prices.

Option 2: Preconditioning

For operations that have adequate facilities, often the best strategy is to wean the calves and feed calves during a 30- to 45-day preconditioning program. A variety of approaches and feeding strategies have been evaluated.

Calves can be placed back on pasture and supplemented, or fed free-choice hay or a total mixed ration (TMR) in a drylot.

If the calves have not had access to creep feed prior to weaning, it is important to start them on a high-roughage receiving diet and transition them gradually to grain or coproducts. Grain coproducts such as distillers' grains, corn gluten feed and soybean hulls make excellent feedstuffs during the backgrounding phase.

When using corn coproducts, a high-calcium coproduct balancer should be used to ensure appropriate calcium-to-phosphorus (Ca:P) ratio.

Long-term effects

Although the primary focus of preweaning and preconditioning programs is preparing calves for transition

to the next phase and mitigating stress and health risks, early calf nutrition can have lasting ramifications. Plane of nutrition and energy source can affect both performance in the finishing phase and carcass traits.

Historically, cattle feeders focused on nutrition during the feedlot phase as a means to maximize growth and marbling. However, it is now known that intramuscular fat cells (marbling) can increase in number up to around 250 days of age. Nutrition during this "marbling window" largely determines the marbling potential of the calves

later in the feedlot phase.

Calves fed high-starch concentrate feeds during this period have improved marbling and quality grades at slaughter. Calves that are weaned at 200

days of age or older have limited opportunity during this window. Although early weaning is typically implemented to provide nutritional reprieve to the cow and improve pasture carrying capacity, it can also benefit the calf. When calves are weaned at 150 days of age or younger, there is a larger window of opportunity to affect their marbling potential.

Protein requirements of young calves are related to energy intake and targeted average daily gains (ADG). As energy intake increases, crude protein (CP) requirements increase to meet targeted gains.

Typically, crude protein requirements range from 12% to 14%. Several experiments have been conducted to determine the effects of increasing crude protein up to 20% or even greater. The majority of these experiments report that average daily gain increases linearly with increased crude protein.

Intake of rumen undegradable protein (RUP) and metabolizable protein should also be considered. Distillers' grains are a good source of RUP, which is another reason to consider distillers' grains as an ingredient in the preconditioning program.

Data is more limited on feeding younger, lightweight calves, but recent research indicates increasing metabolizable protein results in improved growth performance.

The effect of increased protein on morbidity is less understood. Some studies report increased morbidity with inclusion of high crude protein (18%-20%). Further research is needed and is currently being conducted.

Vitamin and mineral status of calves at time of weaning can vary greatly and is typically unknown in a commercial

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setting. Trace mineral supplementation (free-choice or injectable) has been evaluated. Results are variable regarding effects on immunity and growth. Calves that are deficient respond to supplementation.

Given the difficulty to know and assess trace mineral status in calves in a production setting, it is recommended to provide trace minerals in the ration or offer free-choice access. Use of injectable trace minerals prior to weaning or at the beginning of the preconditioning phase has gained interest and popularity, as well. This allows producers to ensure each calf receives the appropriate amount at the “right” time, and avoids dietary interactions.

Recent research investigated the effects of vitamin E and vitamin C with regard to weaning and shipping stress. Improving antioxidant status prior to a stress event could improve post-stress performance. It is well documented that vitamin and mineral nutrition is essential for proper immune response and growth performance. However, it is difficult to determine a true cost-benefit on various strategies to improve status.

Cost vs. benefit

The most common question regarding all of these strategies to improve nutritional status is “does it pay?” The most common answer is usually “it depends.” From a management standpoint, this is not a very helpful answer. Still, cow-calf producers can evaluate several factors to help determine which side of the fence they are on regarding “it depends.” The key questions I began with are:

- ▶ What’s your target market?
- ▶ What’s the current nutritional status of the calves?
- ▶ What feedstuffs are available and at what price?
- ▶ What are current feeder-calf prices?

When you plan to retain ownership, you don’t have to convince anyone but yourself on the value of what you have done. Also, you will have the data to inform future decisions. When you are selling your feeder calves, it is a different story. One of the keys in getting a return on your investment is documenting and communicating your nutritional management.

Finally, this should not be a one-size-fits-all approach. Each operation is different. Managers should be prepared to vary their nutritional program each year. ■

Editor’s note: “The Digestive Tract” is a regular column in the *Angus Beef Bulletin* focused on nutrition for the beef cattle life cycle. Dan Shike is associate professor in animal sciences at the University of Illinois.