



Midcontinent Livestock Supplements

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PROVEN PERFORMANCE

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Valley Mills, TX 888-657-8827

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Proper nutritional management of weaned calves is critical in ensuring optimal health and performance. It is important to develop weaning rations that will adequately prepare calves for efficient growth and profitability in backgrounding and finishing programs or for a lifetime of productivity in the cow herd. Understanding the digestive physiology of a ruminant animal can help provide some insight about how various feedstuffs and rations may impact future production potential.

Digestive Physiology

Cattle have four compartments in their stomach (rumen, reticulum, omasum, and abomasum) that allow for efficient digestion of fibrous feeds. The rumen is the largest compartment and is where the majority of fermentation takes place with the assistance of billions of bacteria, fungi, and protozoa. The rumen microbial population digests fiber components (i.e. cellulose and hemicellulose) to yield by-products such as microbial protein and volatile fatty acids (VFA's). Protein that is digested in the rumen is used to support microbial function and growth, while VFA's are primarily absorbed and utilized as energy by the animal.

Rumen Development

When calves are born, their initial digestive processes are similar to simple-stomached animals (monogastrics) such as pigs in order to maximize digestion of milk proteins, fats, and simple sugars. Rumen development begins within the first several days to weeks after birth, and is advanced by exposure to bacteria from the environment and consumption of solid feed. There are essentially two layers in the rumen; a muscular layer that assists in contraction and mixing of feed, and an epithelial layer that functions in absorption of nutrients. The production of VFA's from solid feed stimulates development of the epithelium, which increases surface area in the rumen. The epithelium elongates into small projections called papillae that increase the absorptive ability of the rumen. Both hay and grain are important for production of VFA's and rumen development. Fermentation of starch in grain produces high amounts of the VFA butyrate, which has been shown to play a critical role in formation of papillae, while forage intake promotes muscle development in the rumen and stimulates rumination and saliva production.

The figures below show rumen development in dairy calves at six weeks of age fed various combinations of milk, hay, and grain (photos courtesy of Penn State Extension). A healthy rumen has a dark coloration due to large blood vessels and greater tissue mass. Papillae should



Ration Weaning Tips

There are a variety of options available for weaning rations depending on the marketing plan and production goals. For normally weaned calves, receiving programs may be based on either forage or concentrate depending on available resources. If forage quality and availability is high, turning calves back onto pasture several days after weaning is a good option. Other programs may utilize a forage-based diet with supplement. Concentrates that are high in digestible fiber and moderate to low in starch such as distiller's grains, wheat middlings, and soybean hulls have been shown to provide adequate gain without the potential management issues associated with starch-based concentrates. A 50-60% concentrate ration is typically recommended for normally weaned calves. Good quality grass hay or medium quality alfalfa hay should be fed for the first several days at around 2% of body weight, followed by the introduction of concentrate. Utilizing a mix of forage and concentrate will stimulate rumen capacity and development, resulting in a healthy microbial population and optimizing health and performance of weaned calves



GOOD JOB BRAYLIN

MLS would like to congratulate Braylin Brunkhorst on showing the Grand Champion Market Lamb at the Howard County, MO Fair. Braylin is the Granddaughter of longtime MLS Missouri Plant Manager Neal Brunkhorst. The proud Grandfather is pictured here with Braylin. Team MLS is proud of you Braylin and are happy to be a part of your winning efforts.

WEANING * BACKGROUNDING * REPLACEMENTS

MLS #5 STRESS TUB

- ▶ Vitamin, Trace Mineral, Protein, and Energy Tub for Young Cattle.
- ▶ For Weaning, Shipping, or Situations Leading to Stress.
- ▶ Contains Availa®4 Organic Trace Mineral Package.
- ▶ Celmanax®SCP for *e-coli* and *salmonella* Protection.

PRE CALVING NUTRITION

MLS #15 HI ENERGY PLUS

- ▶ Protein, additional energy, and organic trace minerals.
- ▶ High energy for beef cows on low quality hay, dry grass or stalks.
- ▶ Labor saving, cost effective replacement for cake or range cubes.

MLS #1 HI PERFORMANCE

- ▶ Balanced concentration of vitamins, minerals, energy, and protein.
- ▶ For cattle needing both protein and mineral supplementation.
- ▶ Weatherproof, no waste supplement delivery system.

CELMANAX™

CELMANAX™SCP can be effective in reducing the incidence and/or severity of bovine respiratory disease (BRD) and scours caused by *E. coli* or *salmonella*.

ZINPRO

Availa®4 is a combination of organic zinc, manganese, copper & cobalt. Essential trace minerals for maximizing the health and performance of your calf crop! Available in many MLS products.

CELMANAX™SCP and ZINPRO®AVAILA®4 are available in these products and many other MLS tub supplements.

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