

Making feeding more efficient: Matching cattle requirements to available resources

Dr. Brandi Karisch – Extension Beef Cattle Specialist, Mississippi State University

Recent lower cattle prices have many producers taking a close look at their inputs, and evaluating places where a few extra dollars can be squeezed to help make a profit. The largest expense for cattle operations is easily found in feed costs, and is often the first place producers start their budget evaluation. A good place to start is evaluating your forage and supplementation program to more closely match animal needs.

The goal for most stocker producers typically involves adding value to cattle. Typically, this comes in the form of added weight and improved health. In Mississippi, cattle producers are fortunate to have a generally abundant forage supply to meet most of those nutrient needs, and when forage alone does not meet the levels required to reach desired goals, a wide variety of feeds are available to support additional gain. The ruminant digestive system allows cattle to utilize a wide variety of feedstuffs, and there is no one “best” feed for every situation.

Nutrients from the diet are required to support body maintenance, reproduction, lactation, and growth. The nutritional needs of beef cattle vary by age, class, stage of production, performance level, and weight. Physiological and environmental stressors, such as sickness and weather, can also affect nutritional requirements. Beef cattle need water, protein, carbohydrates, fats, minerals, and vitamins. Of these nutrients, they require water in the greatest amounts daily. The second greatest need is energy, which is supplied by carbohydrates, fats, and protein. Protein is essential in beef cattle diets, and is typically the most expensive nutrient to supplement. Of the nutrients listed above, beef cattle need minerals and vitamins in the smallest quantities, but they are essential to health and productivity.

One of the first steps in determining what need to be supplemented, is first to determine how much forage an animal can be estimated to consume. While pinpointing an exact consumption estimate is difficult, there are certain rules of thumb that can be followed to estimate intake. Estimates of how much forage or feed an animal will consume is needed for diet formulation and prediction of animal performance. Daily dry matter intake of forage and feed is the amount of forage and feed (excluding the moisture content) consumed in a day. Cattle require certain amounts (reported in pounds) of certain nutrients every day, such as protein or calcium. To meet specific nutrient requirements, the percentage of nutrients in the diet for cattle is based on the quantities of forages and feeds consumed daily. Many factors affect dry matter intake, including animal weight, condition, stage of production, milk production level, environmental conditions, forage quality, and amount and type of forage or feed offered. Forage intake capacity is affected by stage of production and forage type and maturity. Forage availability is the most important factor affecting forage intake on pasture. A general rule of thumb is that cattle will consume approximately 2.5% of their body weight on a dry matter basis per day.

Extreme temperatures and weather can impact feed intake. The thermal neutral zone is the effective temperature range within which performance and efficiency are maximized. As temperatures rise above the animal’s thermal neutral zone upper critical temperature (such as in the heat of the summer), dry matter intake falls. As temperatures drop below the animal’s thermal neutral zone lower critical temperature (such as in the dead of winter), dry matter intake

increases. The effects of temperature on feed intake depend upon the animal's thermal susceptibility, acclimation to the conditions, and diet. Mud, precipitation, humidity, and wind heighten temperature effects on feed intake. The duration of these adverse conditions and the photoperiod, or length of daylight, may also influence feed intake. It is important to consider the effects that temperature will have on intake when determining an animal's needs.

Complete tables and a more thorough discussion of beef cattle nutrient requirements can be found in Publication 2528 Beef Cattle Nutrient Requirements (<http://extension.msstate.edu/node/7284>). Data provided in the nutrient requirement tables can be helpful in determining specific beef cattle nutrient requirements. The values listed in the tables serve as a general guide for matching forage and feeding programs to cattle nutrient needs. These tables are intended to be used as a general guide, but it's important to remember that actual nutrient requirements vary depending on many animal and environmental factors. Since the requirements of growing cattle can change rapidly as they grow, it is important to make adjustments to cattle diets to achieve desired performance results. Tabular values are intended for healthy, unstressed cattle in good body condition. Thin cattle need additional nutrients to improve body condition. Cattle under stresses, such as weather extremes or physical exertion, also require extra energy for maintenance.

Forage testing provides producers with the knowledge of the nutrients and helps to eliminate guesswork when it comes to supplementation decisions. We all know that everyone's hay is "really good" until it gets tested. It is important to remember that no matter how "good" a bale of hay looks or smells, you won't know the nutrient quality until you send off a sample! This aids in matching forage quality to animal requirements, and aids in designing a supplemental feeding program. With a wide variety of forages used for hay production in Mississippi, there is a wide range of forage nutrient quality. More information on forage testing can be found in Publication 2539 Hay Testing and Understanding Forage Quality (<http://extension.msstate.edu/node/7033>). Your local Extension agent is a great resource for helping to obtain and submit a sample of your hay.

While determining the nutrient requirements for a group of cattle may seem like a daunting task, it can be broken down into several steps. Having knowledge of both cattle needs, and the nutrients available from the forage gives producers the opportunity to be more efficient and more accurately target end goals.

For more information about beef cattle production, contact an office of the Mississippi State University Extension Service.