BETTER FEED, BETTER RESULTS SUMMER 2021

Livestock Nutrition Center
Better Feed, Better Results

NEWS

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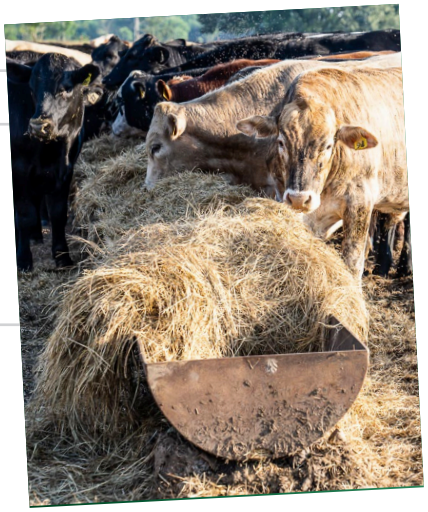

ENERGY SUPPLEMENTS IN FORAGE DIETS

By: Levi Trubenbach, Ph.D - Livestock Nutrition Center

Stocker operators often feed supplemental energy to calves on forage-based diets to increase gain, stocking rate, or both. Historically, the standard energy supplement has been grain-based, in conjunction with a protein source to optimize ruminal fermentation. However, our team often recommends hand-feeding a blend of mostly byproduct ingredients, including beet pulp, soybean hulls, wheat middlings, etc. While the calculated, or "book," energy values (TDN = 69-74%) of these byproducts are significantly lower than that of corn (TDN = 89.5%), several experiments have concluded that their actual nutritive value, when supplementing a forage-based diet, is equal to corn.

How is this possible? If energy consumption increases, then performance rates should follow suit, right? While this concept is fundamental in nutrition models, there is a key distinction to be made between calculated and true energy values that occur in reality. Grains are fermented rapidly in the rumen, causing accumulation of organic acids. Acid accumulation can inhibit proliferation of fiber-fermenting microbes; if fiber fermenters are not populating the rumen in sufficient quantities, then potential fiber digestion rates are often not achieved. In other words, changes in the ruminal environment can have significant effects on the digestibility of individual ingredients. In grain-based feedlot diets (from which book energy values are calculated), intense ruminal acid production reduces fiber digestion substantially, suggesting very low nutritive values for many high-fiber ingredients. Moreover, the total energy lost from undigested fiber is minimal in feedlot diets because roughages (and their potential energy from fiber) typically only represent 10% of the diet or less.

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Circle back to the point of this article: forage-based diets contain at least 40-50% forage, so total energy losses from poor fiber digestion can represent a larger percentage of the total available. If our diet is 60% hay, a moderate reduction in fiber digestion rate can lead to substantial losses in actual energy intake and animal performance. The point is: calculated energy values (TDN, for example) do not always tell the whole story. Sometimes we need to rely on controlled experiments to help us define nutritive values in the diets we are feeding, rather than relying on published numbers.

Most grain byproducts are high in fermentable fiber, which means they generally support the growth and productivity of fiber-fermenting microbes. This provides complementary energy supplementation to the basal forage diet. Moreover, these byproducts are often cheaper than corn, and all have protein values equal to or better than that of corn. That means we can reduce the total cost of supplementation, while maintaining targeted performance objectives.

PRODUCING QUALITY HAY

Dr. Vanessa Corriher-Olson, Professor & Forage Extension Specialist
Texas A&M AgriLife Extension

Hay is the most common source of stored feed used in livestock operations. Because most of the harvested hay is used on the producer's own farm, producers should be concerned with producing high quality hay to maximize animal performance.

The range of hay quality varies greatly, depending on climate, soil fertility, weed control, stage of maturity at harvest, harvest conditions, and storage. Most forage species, whether legumes or grasses, can produce high- or low-quality forage. Low quality hay requires extra supplementation to meet animal requirements. High-quality hay is dry, palatable, and a highly digestible forage that has enough nutrients to meet the livestock's nutritional needs.

Hay quality is affected by such factors as maturity at harvest, soil fertility, nutritional status of the plant, available moisture during the growing season, season of the year, ratio of leaves to stems, stem size, weed control, foreign matter, harvesting, weather at harvest, and storage. Of all factors, the most important is stage of maturity or age of the plant at harvest.

As a plant matures towards heading, flowering and seed formation, its growth pattern changes from producing digestible leaves to producing indigestible hard stems and the ratio of digestible leaves to indigestible stems changes. This ratio determines the forage's nutritive content and digestibility.

At each growth stage, the digestible part of the plant tissue decreases rapidly. To optimize both forage quality and forage yield it is commonly recommended that forages such as bermudagrass be harvested every 3 to 5 weeks and that forages such as sudangrass and sorghum x sudangrass hybrids be harvested before mature seed head production.

Harvested forage that is left to be rained on may exceed 40 percent moisture content for an extended period and lose substantial energy content due to leaching of non-structural carbohydrates. Rain can also shatter leaves off harvested forage and reduce both the crude protein and energy levels of the hay. It is better to wait for good curing conditions than to take a chance that rain will fall on mowed hay. At baling, the moisture content of hay for large round bales should not exceed 18 percent; for small square bales, moisture content should not exceed 20 percent. Tight windrows, moist soil and cloudy humid conditions all delay drying and promote valuable energy losses.

Close attention to all aspects of hay production will result in production of high quality and quantities of livestock feed.

UNDERSTANDING HEAT STRESS IN BEEF CATTLE

By: Cody Welchons, Ph.D - Livestock Nutrition Center

Coming into the heat of the summer, it is important to think about how high temperatures and humidity can affect cattle and to consider potential methods to mitigate heat stress. While cattle in pens are more susceptible to heat stress, cattle on pasture can also be affected if there is not sufficient shade for them to loaf in or open water sources for them to cool down in. Research at the US Meat Animal Research Center (MARC) has identified four major risk factors for cattle influencing susceptibility to heat stress.

1. GENETICS- European lineage and dark colored cattle are the most susceptible compared to light colored cattle and breeds that are tropically adapted.
2. HEALTH- Cattle that are currently sick or those that have experienced previous cases of pneumonia are at elevated risk due to decreased lung capacity limiting their ability to dissipate heat through respiration.
3. PRODUCTION STATUS- Heavier cattle are at greater risk than lighter cattle (i.e., close to finished cattle in the feedyard vs stockers on grass).
4. PREVIOUS EXPOSURE TO HEAT STRESS CONDITIONS- Cattle that have been recently transferred from more temperate climates are likely to show a greater stress response than cattle that have had time to acclimate to hotter conditions.

As cattle are largely unable to dissipate heat through sweating, they will primarily regulate body temperature through increasing their respiration rate (panting) and decreasing feed intake. Reduced feed intake will decrease heat generated by ruminal fermentation, which will help the animal reduce overall heat loads. Thus, their ability to regulate body temperature is influenced by air temperature, relative humidity, wind, thermal radiation, and diet. Once the heat load of an animal surpasses its ability to dissipate that heat, stress occurs.

MANAGEMENT CONSIDERATIONS TO MITIGATE HEAT STRESS

1. HANDLING - During periods of heat stress only work or move cattle early in the morning, and under extreme heat conditions refrain from handling cattle at all. Handling cattle causes an increase in body temperature to which there is a lag time before core temperature reaches its highest point. Therefore, under extreme heat conditions, even when it starts to cool off cattle should not be handled in the evening.
2. WATER INTAKE – In the summer mature cows require 20-30 gallons of water per day, with this number increasing under extreme heat stress. Ensure that there is both adequate drinking space (3 linear inches per animal) and water pressure/capacity to supply needed water.
3. SHADE – Providing 20-40 square feet of shade per animal (artificial or natural) can increase gains compared to non-shaded cattle both in confinement feeding and grazing scenarios.
4. TIMING OF FEED DELIVERY – During periods of extreme heat, it may be beneficial to feed a greater amount of the daily feed delivery in the evening as cattle can then dissipate heat from their diet in the cooler part of the day compared to morning when they must dissipate heat production from eating during the hotter part of the day.
5. FLY CONTROL – If cattle are suffering from heavy fly infestations, they will tend to gather in groups which reduces evaporative cooling due to decreased air flow.

References: US Meat Animal Research Center – About Cattle Heat Stress https://www.ars.usda.gov/plains-area/clay-center-ne/marc/docs/heat-stress/main/; Iowa State University – Heat Stress In Beef Cattle https://vetmed.iastate.edu/vdpam/about/production-animal-medicine/beef/bovine-disease-topics/heat-stress-beef-cattle; Noble Research Institute - When It's Hot It's Hot and When It's Not, It's Still Hot! https://www.noble.org/news/publications/ag-news-and-views/1999/august/when-its-hot-its-hot-and-when-its-not-its-still-hot/

HOW TO WEAN CALVES WITH HIGH FEED PRICES

By: Henry Hilscher, Ph.D - Livestock Nutrition Center

As we prepare for the summer heat and weaning calves later this year, it is a good time to reflect on last year's weaning. What worked well and what would you change? Apart from the gate that needs to be fixed or the squeeze chute that needs to be greased before weaning, have you looked at commodity prices? When this article was written, December corn was at $6.00/bu and November feeder calves were $159/cwt. How do those prices affect your strategy for this year? With corn and commodity prices high, ration cost will have a big influence on how and when to wean calves. Determining your expected Value of Gain (VOG) could help you decide whether to retain your calves to a heavier market weight or wean quickly and sell earlier. The VOG is the value per head of the animal at the end of the weaning/feeding period (sale value) minus the value of the animal at the beginning of the weaning/feeding period (purchase value) divided by the weight gain.

For example, based on the last three years of AMS data, a 575 lb steer in Oklahoma City in October could be sold at $149.08/cwt and bring $857.21 per head. A 772 lb steer in the same market could be sold at $142.71/cwt and be worth $1,101.72 per head. Taking the difference in ending and beginning value divided by the weight difference gives you a VOG of $1.24/lb. Every pound of gain is worth $1.24/lb, so if your Cost of Gain (COG – the cost to put on 1 lb of gain) is less than $1.24/lb, it makes sense to increase the weight of your calves. If your COG is above $1.24/lb, then selling them as soon as possible is the best route.

Inital weight	Value at beginning	Sell weight	Value at the end	Weight difference	Cost difference	Value of gain
575	$857.21	772	$1,101.72	197	$244.51	$1.24

In another example, adding 100 lbs of gain over this same time period has a much lower VOG, so your weaning program would need to change in order reduce COG below the VOG of $0.60/lb.

Inital weight	Value at beginning	Sell weight	Value at the end	Weight difference	Cost difference	Value of gain
426	$766.45	527	$827.41	101	$60.96	$0.60

Market conditions and seasonality will dramatically change VOG. Your analysis should be based on your local markets and should be continually updated along with COG.

Having a good idea of when you are going to sell will help with the weaning process and determine the kind of weaning program to utilize. Mitigating stress should be goal number one. Reducing weaning and handling stress, providing proper nutrition, and preconditioning against disease increases the value of your calves and improves their performance when they enter the growing and finishing period.

Separating calves from their dams at weaning causes behavioral changes and stress. Vocalization, walking fences, and reduced intake can all result in reduced performance and health concerns. Pre-weaning management, 2 to 3 weeks before weaning, is important to ensure calves can continue to grow and stay healthy when exposed to the stressors associated with weaning. Giving shots early will help develop

immunity, and getting calves used to eating feed before you wean them can have a big impact on stress at weaning. Start with some supplementation on pasture. Calves will learn by watching their mothers eat.

If calves are allowed to continue grazing after weaning, consider the nutrient content of the forage. Warm season forages are declining in nutrient content at the end of summer. Weaned calves grazing warm season grasses in the fall may require supplemental feed depending on your weaning plan. Consider the price per pound of protein and energy in your feedstuffs and which sources offer the greatest return on investment. Cheaper options might not always be better options.

Calves moving from grazing to a dry lot for weaning must learn to eat from a bunk. Ensure that each calf has at least 18 inches of linear bunk space. The feed bunk should be easily accessible to the calves. Unlimited access to fresh, clean water is essential for weaned calves.

Make accommodations to familiarize the calves with new water sources. Allowing the water source to overflow for a brief time may help calves find the water. Maintaining feed intake is crucial. By feeding long stem, high quality grass hay in the first two- or three-days post-weaning, you can get the calves accustomed to eating from the bunk and establish good eating behaviors. After two or three days, begin adding some energy feeds to the diet.

The diet can be delivered as a total mixed ration, or the energy feed can be fed on top of the hay. While energy is important, energy sources that are high in starch, such as corn, should be limited to 50% or less of the diet dry matter. Ionophore additives also boost feed efficiency and average daily gain. When feed prices are high, adding ionophores to feed supplements are a good choice to improve weight gain.

In hot weather, consider pasture condition and air flow. Lack of shade can promote crowding. Read the recent article on heat stress by Dr. Cody Welchons on more info on shade mitigating heat stress.

For more information, contact your LNC representative to discuss your weaning program.

References: Management, Health, and Nutritional Considerations for Weaning Calves NebGuide http://www.ianrpubs.unl.edu/sendlt/g2057.pdf, USDA Agricultural Marketing Service. Feeder Cattle Report Oklahoma National Stockyard Feeder Cattle 2020-2018 https://mymarketnews.ams.usda.gov/public_data?slug_id=1280

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MEET THE TEAM

LNC takes great pride in sourcing our employees. Each issue we will introduce you to one of our own.

Levi Trubenbach, Ph.D.
Nutritionist
Saginaw, TX // Quanah, TX // Hereford, TX // Altus, OK

Levi grew up on a family-owned stocker and cow-calf operation in North Texas. He received his BS in Animal Science, along with both MS and Ph.D. degrees in Ruminant Nutrition from Texas A&M University. Levi's, research was focused on limit-feeding gestating beef cows, fetal programming, and stocker production systems.

Today, the bulk of Levi's focus is on optimizing feeding strategies for preconditioning and bull development facilities, grow yards, cow-calf producers, and forage-based stocker cattle managers.

JOIN OUR TEAM

Do you know someone that would be interested in joining our team?

At Livestock Nutrition Center we are always looking for qualified hard-working individuals. All of our positions offer a competitive salary, full benefits and uniforms.
https://www.lnc-online.com/careers/

MARKET OUTLOOK

By: Matt DeFlon, Procurement Manager, Livestock Nutrition Center

Volatility continues throughout the market, with September corn futures seeing price swings well in excess of $1.00 per bushel since the last writing of this update in April.

The driving force, however, has shifted from demand to weather. Demand is still lurking, but high prices have suppressed buying interests both domestically and internationally for the nearby. The weather over the next two to six weeks will be crucial to the state of corn and soybean crops, especially in the NW region of the corn belt.

If favorable growing conditions continue through this time frame, supply and demand figures tell us we should come out okay from an ending stock perspective. However, with slightly below estimated planted acres of both corn and soybeans recently reported, the condition and yield of this crop will become even more important.

High prices and favorable pasture conditions have subdued buying interests in feed ingredients as well. As mentioned in the previous recap, it is important to remember that these ingredients are a byproduct from the production of ethanol, flour, corn syrup, etc. Just as the demand for ethanol will drive the supply of DDG, these plants will also find the value necessary to keep the byproduct moving in times of weak demand.

Corn prices will play a role in where values go from a relative value standpoint when demand does pick back up. But, as these byproduct markets continue to mature, evolve and find new markets over time, what was once a typical relative value may not be the case any longer.

Along with ingredients, the fiber/roughage market has begun to stabilize. Rain across TX, OK, CO, KS have turned what would have appeared drought like conditions into more favorable growing conditions and better outlook. Conversely, the same dry areas being watched in the grain markets will have an impact on supply line traditionally coming from SD, ND, MT, etc.

For the next six plus weeks, weather will continue to be the driver of volatility in the market. The next few weeks will tell us a lot about the state of our crop and which direction we move from here.

LOCK IN SAVINGS

High Density Nutrition™ Booking Program

Book by August 18

When you take advantage of our High Density Nutrition™ Program you will receive $5 OFF RangeMax® Cubes or High Protein Supplement Blends when booked together with FortiGraze® Mineral and Tubs. *$5 OFF offer is only valid when booking together.* **BULK DELIVERY AVAILABLE.**

$40 OFF/TON
FORTIGRAZE® Minerals & Tubs
and
RANGEMAX® Tubs

$5 OFF/TON
RANGEMAX® Cubes
and
High Protein Supplement Blends
Additional savings when booked with FortiGraze

$5 OFF/TON
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All tons must be contracted by August 18, 2021. A minimum of two tons of FortiGraze mineral products is required and must take delivery by March 31, 2022 to receive discount.

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