TDN and feeding the cow herd

By Paul Beck

We recently held a series of drought management meetings to help producers affected by this year’s drought find ways to keep their cowherds together through the winter. I know this meeting may have introduced more questions into our minds than answers. We must remember there is no ‘one size fits all’ feeding program for wintering beef cows. There are so many factors to consider in designing a winter feeding program it is impossible to make blanket recommendations. My goal when designing a feeding program is to do this on a least-cost basis and do so to the extent that the program fits the producer’s goals, meets the nutritional requirements of the cowherd, and matches up well with the producers’ feeding management skills, facilities and equipment.

Matching the cow’s nutritional requirements. A 1,200-pound dry pregnant beef cow in her third trimester requires 1.9 pounds of crude protein and 12.6 pounds of total digestible nutrients (TDN, a measure of energy) or 7.8% crude protein and 52.6% TDN, based on hay intake of 26 pounds per day. Once this cow calves, she requires 2.8 pounds of crude protein and 16.4 pounds of TDN. The increase in available capacity in her body cavity and the additional metabolic stress from milk production increases her hay intake to over 32 pounds of hay a day. Even with this large increase in hay consumption, the lactating cow’s nutrient requirement increases to 10% crude protein and 60% TDN. The lactating cow requires 25% more feed, 14% more energy, and 30% more protein than the gestating cow. This year’s short hay supplies and high feed costs make it very expensive to feed a lactating cow through the fall and winter. The large increase in nutrient requirements for the lactating cow is the primary reason for maintaining a calving season that fits your forage resources or at least being able to split cows into feeding groups based on expected calving date. If you feed cows that are fall calving and spring calving in the same group this winter your choice is ... Do I overfeed the dry pregnant cows or underfeed the cows with calves? Either case is expensive and wasteful.

Matching the producer’s feed management skills. When hay and forage is limited feeding management becomes more complex. With limited availability of hay, we can no longer put out multiple days worth of hay for cows to sort through and self-fed convenience products may not be something that can be used successfully. When cows are offered hay free-choice waste becomes a huge issue! If you do not have enough hay to make it through the winter and additional hay costs over $50 per bale, can you afford to lose 30 to 50% of it through poor feeding management?

Some producers are savvy enough and have the equipment available to make total mixed diets that can be limit fed to their cows. The feeding levels depend on the cow’s stage of

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Beck: Tailor-made feeding programs are best

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production and the energy content of the feeds used but range from 50 to 90% of full feed. With high hay prices, this feeding system can save a producer 30 to 40% in feed costs compared to free-choice hay feeding and a by-product based supplement.

Other producers that don’t have the necessary equipment or time to mix feed daily may be able to feed high levels (0.6 to 1% of cow body weight, or 7 to 12 pounds of feed per day to a 1200 pound cow) of a low-cost, low-energy supplement that can be used to reduce hay needs, yet not make cows too fat. Self-feeding liquid feeds or blocks as the sole supplement with hay is not recommended in the majority of our situations this year. These feeds are usually very effective at supplying protein and minerals to cows but many of these products are designed with very low consumption targets and the amount of energy provide by the supplement is quite small. These types of supplements mode of action is to stimulate rumen microbes, increasing intake of low quality hay and forage. When hay and other roughage are in short supply and expensive, stimulating increased intake may not be in our best interest. Some of these feeds can be very easily used as a part of total mixed diets (providing protein, minerals and dust control) or as a component in a supplementation program.

Feeding programs should be tailored to fit your operation. Programs that fit one operation will not necessarily fit yours. It is always best to consult with a trained specialist when making changes from your normal winter feeding program that always worked in the past.

Sample programs using alternate feed for beef cows

By Paul Beck

In the past couple of months I have gotten several calls about alternate sources of roughage and feeding supplements to replace hay. The majority of calls are regarding a sugarcane byproduct commonly called Sugarcane Bagasse, corn stalks or other crop residues, and rice mill feed type products. Here are some of the results we have gotten from our lab analysis of these products and some possible uses of them in feeding programs.

Sugarcane Bagasse—This byproduct of the sugar production industry can be used as a replacement for hay in many situations, but there are some problems. Dry matter is only around 50%, so there is a lot of water that is being delivered to your farm and freight on that water is not cheap. Protein levels are very low ranging from 2 to 4%. Digestibility and thus energy content is highly variable. One load we sampled was 54% TDN another load we sampled was only 36% TDN. When planning a feeding program we can make guesses about animal performance based on average energy content, but considering the variation, we will likely be wrong.

Corn Stalks and other crop residues—Crude protein estimates have ranged from 3 to 8% for milo stubble and corn stalks and TDN estimates range from 40 to 58%. This variation is usually related to the amount of crabgrass, barnyard grass and broadleaf signalgrass contaminating the fields. Care should be taken to ask the farmer about the use of herbicides and fungicides in their crop production that may contaminate residues before purchase and test for toxic nitrate concentrations before feeding.

Rice Mill Feed—A byproduct of the rice milling industry. I include other similar products with names like Animal Feed, Chicken Feed, and Rice Tailings into this category. These by-products are highly variable but average around 7% crude protein and 42% TDN. Protein analyses have come back as low as 4% and as high as 9% with TDN ranging from 36 to 64% depending on the amount of broken rice kernels in the batch.

Diets for Cows (1,200 pounds, 20 pounds peak milk) Using Sugarcane Bagasse:

Mixed diet. 60% Sugarcane, 20% Dried Distillers Grains, 20% Rice Mill Feed. Feed 33 pounds/cow/day to dry cows and 44 pounds/cow/day for lactating cows along with a balanced mineral.

Fed separately. Feed Sugarcane free-choice (intake will be around 30 lb/cow/day) along with 10 pounds per day of a supplement consisting of 50% Rice Mill Feed and 50% Dried Distillers Grains for a dry cow and 15 lbs/cow/day supplement for a lactating cow along with a balanced mineral.

Using Crop Residues:

Mixed diet. 42% residue, 20% Dried Distillers Grains, 38% Rice Mill Feed. Feed 24 pounds/cow/day to dry cows and 30 pounds/cow/day to lactating cows along with a balanced mineral.

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Sample questions?

If you have questions regarding this article, pasture management, or balancing beef cattle diets, feel free to contact your local County Extension office or Paul Beck at (870) 777-9702 or pbeck@uax.edu

Have questions?

Sample programs using alternate feed for beef cows

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Poultry Litter:

Feed in mixed diet containing 40% hay or crop residues, 20% Litter, 20%, Rice Mill Feed, and 20% Corn at a rate of 25 lb/cow/day for dry cows and 30 lb/cow/day for lactating cows.

If using Sugarcane Bagasse with Poultry Litter change diet to 57% Sugarcane Bagasse, 14% Litter, 14% Rice Mill Feed and 14% Corn and feed 25 lb/cow/day to dry cows. Lactating cows will need 45 pounds of a mixture made up of 62% Sugarcane Bagasse, 19% Litter, and 19% Corn. Diets containing litter will need supplemented with Vitamins A and D, and salt.

These are some general recommendations, it is impossible to formulate diets to fit all situations, therefore it is recommended that you seek the advice of a trained professional in developing your winter feeding program.
Considerations in feeding litter

By Shane Gadberry

A few factors to consider when feeding litter:

Digestibility. The normal range for litter total digestible nutrients (TDN) is 44 to 55%. On average, both gestating and lactating cows will need supplemental energy. Corn, soybean hulls, and hominy would be good energy supplements. Distillers grains and corn gluten feed would add a lot of unnecessary nitrogen to the diet. Rice bran, defatted rice bran, and Rice Mill Feed would require a much higher inclusion rate than the other energy feeds to balance the energy deficit in litter.

Milk fever. Milk fever may develop when feeding litter to mature beef cows. Many cattle producers believe adding calcium will help, but this likely won’t help. Litter averages 2.9% calcium and 1.6% phosphorus. There is already a good ratio (1.8:1) of calcium and phosphorus. The problem is calcium in litter is 10 times the concentration that is sufficient to meet a beef cow’s calcium requirement. Exposure to the very high calcium content, as well as other minerals in high concentration, is likely causing the body to minimize absorption and focus on mineral storage. Near parturition, calcium needs for milk production increase greatly and due to the exposure of high calcium in the diet, a cow’s body just isn’t prepared to absorb and mobilize stored calcium during this period when fed litter at a high rate. Reducing the amount of litter feeding prior to calving may help. Dairy rations are often formulated to change the ratio of sodium and potassium to chloride and sulfur (DCAD) to reduce incidence of milk fever. Research in Alabama indicated increasing hay supplementation for high litter diets is an effective option to help lower the chances of milk fever; whereas, adjusting the DCAD of a litter based diet does not appear to be effective.

Vitamins. Vitamin A status is “at risk” with long-term feeding of litter diets as well as long-term hay feeding. Vitamins break-down with mineral exposure and litter is very high in mineral content. A vitamin pre-mix can be added to the litter diet. It is difficult to make a specific recommendation for a premix amount to add to the diet because premixes come in different concentrations. Each beef cow needs 30,000 to 40,000 IU (international units) of vitamin A, daily, so if there are 38 beef cows in the herd and a vitamin A premix contains 1 million IU/pound then 1.3 pounds of the premix should be added to the total daily feeding for the herd. A vitamin premix could be added to plain salt as a free choice supplement and would require some trial and error to establish the right level of intake. A place to start with mineral mixing is an old rule-of-thumb that cattle will consume 1 to 2 ounces of salt daily. Going back to the 38-cow example, these cows would be expected to consume 3.5 lb salt/day, therefore, a 70% salt and 30% vitamin premix could be a starting point on this salt and vitamin supplement example. Alternatively, a vitamin injection may be given. Agrilabs AD3 injectable mineral contains 500,000 IU of vitamin A. A vitamin injection given now and a second injection given in 60 days can help control the risk of fat soluble vitamin deficiencies which could result in reduced pregnancy rates. This vitamin injection comes with a withdrawal period for slaughter of 60 days. So, anyone that thinks they may have to cull cows to cope with the drought should not consider using an injectable mineral.

Ammonia control. Products are added to litter in poultry houses to help control ammonia. Two products used are Alum and PLT. Alum is aluminum sulfate and the maximum tolerable level for aluminum in beef cattle diets is 1,000 ppm. Research in Arkansas and Mississippi has examined the effects of diets containing poultry litter amended with Alum. Based on the results, Alum treated litter mixed as a 50:50 ratio with an energy dense feed such as corn could be fed without concern. Unfortunately, many producers may be looking to use a greater rate of litter in the diets (70-80%) and any effect of Alum amended litter fed at this rate is unknown. The other product, PLT, is a sodium bisulfate. While there appears to be no published research on feeding litter amended with this product, this product would be less likely to cause performance issues. Sodium bisulfate is an approved feed additive that is also used in pet and human food and beverages.
Upcoming Events

• Oct. 11 Ouachita Co. Winter Feed Meeting, register by Sept. 27 (contact Jerri Lephiew, Ouachita Co. Cooperative Extension for information)
• Oct. 24 Beef IQ Nutrition, SWREC
• Nov. 1 Red River Master Gardeners, SWREC
• Nov. 3 Arkansas Forage and Grassland Council Fall Conference, Conway
• Nov. 15 Howard Co. Winter Feed Meeting, register by Nov. 1 (contact Sherry Beaty Howard Co. Cooperative Extension for information)
• Nov. 24 Thanksgiving
• Nov. 25 Historical date for start of hay feeding (whether they need it or not)
• Dec. 23 - Jan. 2 SWREC closed for Christmas holiday
• Jan. 3 SWREC reopens

GRAZING -- Even in the slanting sun, evidence of drought shows in the trees and the browning grass in this Madison County pasture. (University of Arkansas System Division of Agriculture photo by Darrin Henderson)

HIGH AND DRY – Drought in SW Arkansas has cooked this stock pond down to the dust, leaving this mallard decoy (inset above) high and dry. (University of Arkansas System Division of Agriculture photo by Joe Paul Stuart)