Beef Tips

July 2006 Department of Animal Sciences & Industry www.asi.ksu.edu/beeftips

Upcoming Events

Early Weaning Meetings
785-332-3171
July 19
3 p.m., Rawlins Co. Fairgrounds
5:30 p.m., St. Francis
July 20
10:30 a.m. MT
Sharon Springs

KLA/KSU Field Days
Aug. 15, 22, 24
Glen Blundon Ranch
SL Cattle Co,
Triangle H Ranch
For further details see page 2

Beef Stocker Conference
Sept. 28
Manhattan, KS
785-532-1267

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Nutrition and management key to early weaning success

KC Olson, cow-calf nutrition and management

Continued dry conditions throughout the plains have prompted many cow-calf operators to begin planning for the pasture and hay shortages that they may face later in the year. Scarce range forage can have serious consequences for those that are unprepared. Reduced reproductive performance associated with poor cow body condition is usually the primary threat. Management strategies that spare forage resources and reduce the nutrient requirements of females during the breeding season may be called for during dry weather.

Early weaning has been used successfully as a measure to spare body condition and to promote reproductive performance of beef cows. Early weaning also provides an opportunity to reduce demand for pasture forage and other feed stocks during drought conditions. Many beef producers regard early weaning as a risky procedure that can elevate health risks and reduce carcass value; this is not the case. Provided that they are fed and managed properly, early-weaned calves (i.e., weaned at 60 to 150 days of age) have a similar incidence of disease and death loss as conventionally-weaned calves (i.e., weaned at more than 200 days of age). Likewise, early-weaned cattle have similar to better carcass quality when compared with conventionally-weaned cattle. Carcass weights of cattle weaned at less than 120 days of age can be smaller than conventionally-weaned cattle; however, carcass weights of cattle weaned at more than 120 days of age are similar to conventionally-weaned cattle.

Early weaning is typically applied when the calf is at least 60 days of age and has been suckling up to that point. The rumen of an animal of that age is nearly fully developed and dry feed consumption can be facilitated with proper management. The first phase of early-weaning nutrition concerns the 7 to 14 day period immediately post-weaning. It is very much like the receiving phase of a stocker/backgrounding operation. Immediately after weaning, specialized diets and management are required to 1) slowly adapt the calf to a dry diet and 2) facilitate normal immune system function.

It is important to keep in mind that rumen microbial populations can require up to 14 days to completely adapt to a new diet. Therefore, the newly weaned calf should be fed a diet that mimics, as closely as possible, feeds contained in the pre-weaning diet. Milk will obviously not be a part of this equation; however, we can still do a reasonably good job of adapting the rumen of the suckling calf to a new diet regime without causing undue digestive upset.

Premium quality grass hays are an essential part of the post-weaning phase of nutrition. These forages should be offered free-choice and in the long-stem form. The long particle size stimulates ruminal motility and encourages extensive rumination (cud chewing); these factors are vital to achieving a smooth transition from an immature rumen to a fully functional one.

It is also important that calves be introduced to concentrate feeds at this point. During the post-weaning phase, calves are predisposed to low intake and disease challenge. Increasing the energy density of the diet can help to alleviate these potential problems. Concentrate feeds should be selected that complement the basal forage. That is, concentrate feeds should be low in starch, high in fiber, and moderate or high in

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Field days set

The annual KLA/KSU Ranch Management field days are scheduled as follows. The first event will be Aug 15 at the Glen Blundon Ranch near Russell. SL Cattle Company managed by Eldon & Scott Lanham near Mound City will host the second event on Aug 22nd. Triangle H Ranch of Garden City will complete the schedule by hosting a field day Aug. 24th.

Events will begin mid-afternoon with a look at unique management practices used by the host ranch and conclude with a complimentary evening meal. For more information contact Twig Marston at 785-532-5428.

Considerations for alternative forages

Twig Marston, cow-calf management specialist

A universal, yearly concern to all cow/calf operations is forage supply. Again, with this year's sparse rainfall, cattlemen are scrambling to supply sufficient forage inventories.

Possible solutions for extra forage production include: crop residues, summer annuals, stressed cropland, and grain co-products. Sometimes these solutions can have animal health considerations (see Toxicity problems associated with drought, page 5). Many factors will influence forage options, making no one solution the best for all producers. The following sections review alternatives.

Crop Residues.

One crop aftermath that has been extensively studied at K-State is wheat straw. It has been fed with supplementation, ammoniated, and mixed with feedlot manure and ensiled to determine its nutritive value. Availability is usually not a concern with the vast number of Kansas wheat production acres. Tons per acre will be affected by the wheat variety planted, weather and moisture conditions, and grain yield.

Alone it is very low-quality forage but properly managed it can become a foundation for cow diets. The nutritive content is usually less than 3.5 percent crude protein, 45 percent total digestible nutrients, devoid of vitamin A, low in phosphorus, and contains no energy for body weight gain. However, it is fiber rich and that is why ammoniating will unlock the energy stored in the plant cell walls. Anhydrous ammonia will also add nitrogen to the straw, enough to almost double its protein content.

Briefly, adding up to 3 percent ammonia to a sealed, plastic-covered straw stack will increase the nutritive value and intake of crop aftermath. See figure 1 for budgeting the cost of ammoniating wheat straw. Safety is the first and foremost concern when preparing the stack and applying the anhydrous ammonia.

Feeding trials indicate that balancing cow diets with ammoniated wheat straw with a wide array of other ingredients can maintain or increase cow body weight. The key is balancing the ration for protein, energy, vitamins and mineral content. Alfalfa hay, wheat midds, corn gluten feed, and grain and/or protein supplement mixes have all been successfully used in gestation cow diets. To successfully satisfy the needs of early lactating cows ammoniated wheat straw diets will need to be fortified with "nutrient rich" supplements.

Untreated wheat straw can also be used in cow diets. It will take greater levels of protein and energy supplementation than

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Figure 1. 2006 budget for making ammoniated wheat straw[a].

Item:	Cost per unit	Total costs
Wheat straw, $/ton	0.00	0.00
Baling charge, $/bale	8.50	714.00
Labor (move and stack bales), 6 hours	10.00	60.00
Machine time and repair, 8 hours	12.00	96.00
Plastic sheeting, 40' x 100', 6 mil	130.00	130.00
Labor (cover, seal, application), 6 hours	10.00	60.00
Anhydrous ammonia, 3% rate, $/ton	490.00	617.40
Miscellaneous	20.00	20.00
Total cost, $/stack		1,697.40
Cost $/ton		40.41

[a]Assuming one stack of straw contains 84, 1000 pound bales.

ammoniated straw, but with the availability of grain co-products in some Kansas counties, it may be more economical than ammoniating the straw. Figure 2 shows the comparison of ammoniated wheat straw with untreated straw and grain co-product mixtures.

Research is limited on the application of molasses-based supplements to untreated wheat straw to encourage increases in dry matter intake and digestibility. Recently an experiment was conducted where medium quality forage was treated with a liquid-molasses protein supplement and the data indicate an increase in forage intake. More classical data using barley or wheat straw also show a 10 to 25 percent increase in straw intake, but only a limited or no increase in digestibility and absolutely no protein response to the urea in the liquid supplement applied. These data indicate that nearly 100 percent of the cow protein requirement is going to have to be supplemented with untreated wheat straw diets. Obviously, more research needs to be conducted in this area to improve the predictability of feeding untreated wheat straw to cows.

Another option for wheat fields is to allow crab grass to grow after wheat harvest, which in turn can be windrowed and baled. Field results indicate the straw/crabgrass bales will contain about 9 percent crude protein and 57 percent TDN. These nutrient levels are sufficient to maintain a late gestating cow without supplementation.

Grazing standing crop aftermath is the final management option. Wheat stubble is the least grazed crop residue; however, corn and grain sorghum residues are quite frequently utilized by grazing. Proper supplementation strategies depend on grazing length, forage and downed grain availability, time of year, weed concentrations, and the animal's stage of production. Traditionally, grazing crop aftermath has been the least expensive method of harvest.

Consult your local extension agent or nutritionist for fact sheets, advice, and ration balancing expertise.

Stressed Crops.

Stressed crops, summer annuals, CRP, and road ditches are other sources of emergency forage. Caution should be implemented as some plants may contain toxic levels of nitrates, prussic acid, oxalates, and other poisonous compounds (see Toxicity problems associated with drought, page 5). Oftentimes one of the first signs of poisoning is abortion which, of course, can be devastating to a cowherd. On the other hand, crops like soybeans, sunflowers, sorghum, corn, millets and clean grass stands can make excellent hay. For example, whole plant soybean hay or silage can contain 15 percent crude protein (much like alfalfa hay). Many times producers need to be looking for tons of forage. That is because diets can be supplemented to meet requirements if bulk fiber is present to maintain diet satiety (cows feel full).

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Figure 2. Comparison of anhydrous ammonia treated wheat straw to a mixture of supplemented, untreated wheat straw (dry matter basis).

	Wheat straw plus		
	Anhydrous Ammonia	Corn Gluten Feed	Dried Distiller's Grain
Wheat straw, % used	100	79	85
Inclusion rate, %	3.0	21.0	15.0
Crude Protein, %	6.5	6.5	6.8
TDN, %	50.0	49.9	48.25
Cost, $/ton	40.41[a]	38.80[b]	34.52[c]

[a]Cost of treated straw from Figure 1.
[b]Cost of untreated straw = $21.20/ton; corn gluten feed = $105/ton.
[c]Cost of untreated straw = $21.20/ton; dried distiller's grain with solubles = $110/ton.

"Provided they are fed and managed properly, early-weaned calves have a similar incidence of disease and death loss as conventionally weaned calves."

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protein during the post-weaning phase. Feeds that fit into this category are cottonseed hulls, soybean hulls, corn gluten feed, distillers dried grains, and wheat middlings to name a few. Corn and other high-starch feeds can also be fed to newly weaned calves; however, care should be taken to limit the amount. In general, whole or coarsely rolled corn should be fed at 0.25 percent of body weight or less during the 1 to 2 weeks post-weaning.

Avoid high-moisture feeds in the post-weaning ration. These feeds are typically unfamiliar to the calf and, as a result, intake is often too low to sustain the calf's high nutrient demands. Examples of feeds that fit into this category are silage, wet gluten feed, wet distillers grains, and ensiled grains. Feeds extremely high in moisture, such as lush pasture, can adversely affect the calf during the post-weaning phase from the standpoint that the calf is unable to consume enough dry matter to meet its nutrient requirements. Dry, concentrate-based supplements can be provided to early-weaned calves grazing lush pasture in order to increase the aggregate dry matter level of the diet and to increase its energy density.

Calves will often consume only 0.5 to 1.5 percent of their body weight in dry matter during the post-weaning phase; therefore, the ration must be fairly nutrient-dense. In general, the post-weaning diet should be 70 to 85 percent dry matter. It should contain 13 to 15 percent crude protein, 0.75 Mcal NE-maintenance/lb, and 0.44 Mcal NE-gain/lb on a dry matter basis. These energy values are the rough equivalent of 68 percent TDN. This diet should be fed until a stable intake level is reached by 85 to 90 percent of the cattle under early-weaning management.

The second phase of early weaning nutrition can be commenced once stable intake of the post-weaning diet has been achieved. As calves enter this feeding phase, they should be slowly adapted to a ration containing 50 to 80 percent concentrate over a period of ten days to two weeks.

Rations containing large proportions of high-fiber byproduct feeds are typically the easiest to manage under these circumstances. These diets should be formulated to contain 12 to 14 percent crude protein, 0.6 Mcal NE-maintenance/lb, and 0.35 Mcal NE-gain/lb on a dry matter basis. In short, the calves should be fed to gain at least 2.0 pounds per day.

Conversion efficiencies are extremely good at this stage of the calf's life, ranging from 4 to 5 pounds of dry matter consumed per pound of gain. This is the time to adapt calves to high moisture feeds like silage. It can be accomplished by providing cattle with the opportunity to select these feeds in addition to their normal diet. Once consumption has reached a significant level (i.e., 0.5 percent body weight), high-moisture feeds can be substituted into the diet as other feeds are removed. This is also the time to consider implants and ionophores for the calves - a growth promoting implant (feeder cattle only; no replacement heifers) is an excellent investment in the calf's growth rate and ionophores will promote improved feed efficiency and gain. Cow-calf producers should pay close attention to labels of these products to make sure that they are used according to Food and Drug Administration (FDA) guidelines.

Potential replacement heifers can be successfully reared as early-weaned calves. All of the guidelines discussed above apply to the early-weaned replacement heifer; however, there are some additional points that must be considered. Replacement heifers should be fed for moderate daily gains (i.e., 1.8 to 2.25 pounds per day) between weaning and first breeding. If the rate of gain post-weaning is too low, age at puberty will increase. Sustained post-weaning rates of gain that are too high (i.e., greater than 2.5 to 3.0) could promote fat deposition in the udder and could reduce the animal's lifetime productivity.

Early Weaning Web Resources

www.ansi.okstate.edu/extn/cc-corner/Earlyweaning.html
http://agebb.missouri.edu/dairy/byprod/index.htm
www.ag.ndsu.nodak.edu/drought/ds-8-97.htm
http://agbiopubs.sdstate.edu/articles/ExEx2031.pdf
http://extension.usu.edu/files/agpubs/beef14.pdf
www.ext.vt.edu/news/periodicals/livestock/aps-99_07/aps-0081.html
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/for8669
www.noble.org/Ag/Livestock/EarlyWeaning/index.htm
http://edis.ifas.ufl.edu/AN131

Beware of toxicity problems associated with drought

Larry C. Hollis, extension beef veterinarian

With the continuation of the drought across much of Kansas, the potential for a variety of toxicity problems rises in cattle. Producers should be aware of these possibilities, and take steps to prevent them from causing performance or death losses.

TOXIC PLANTS – Just because there is something green in the pasture, it does not mean it is grass! A careful walk through the pasture may reveal that the primary source of green is plants that are normally not eaten by cattle because they are toxic. Poison hemlock is one plant that cattle typically avoid, but will eat if forced to do so. It can cause death from respiratory failure, abortions in cows that eat a sublethal dose and birth defects if the cows do not abort. Such things as locoweed will often stay green long after pastures have dried up, and once cattle start eating them they tend to continue to do so. Kochia weed may be toxic if cattle are turned out to graze on it as it is approaching maturity. If you graze kochia, start early in the season and have enough cattle to stock the areas adequately to keep available supplies from maturing. And, if it ever rains again, cockleburs may be the first plants to sprout. They often grow along bottom land. At the 2-leaf stage, cockleburs are highly toxic to cattle. Blue-green algae toxicity can occur, especially as ponds dry up.

NITRATE TOXICITY – Nitrate toxicity may be a problem in both grazed and baled forages. Nitrate accumulation is a problem primarily in Johnsongrass, sorghum-Sudangrass hybrids, and pigweed, but can also cause problems in grain sorghum and corn fields when the plants are severely drought-stressed. Portions of any field that show drought-stressed stunting of plants should be considered potentially toxic. Avoid grazing or baling these portions of fields until you know that they do not contain potentially toxic levels of nitrate. Nitrate does not dissipate when the plants are harvested as hay, so samples should be tested if questionable.

PRUSSIC ACID POISONING – Those plants that typically have nitrate problems can also cause problems when it rains again! When they start sudden regrowth after a period of drought stress, they can produce toxic levels of prussic acid for several days. Grazing should be avoided until fields have been tested and found safe. Fortunately, prussic acid will dissipate if hay is well-cured before being baled.

POLIOENCEPHALOMALACIA – As pond water dries up, dissolved substances in the water will concentrate. Sulfates are normal substances found in water, especially in "gyppy" areas. As sulfate levels concentrate due to evaporation, the total sulfate levels increase. This problem may be accentuated when ethanol by-products are utilized to supplement protein on drought-stressed pastures. When a combination of sulfates from the water and the diet reach a threshold level, they start interfering with thiamine activity resulting in polioencephalomalacia. Polio in cattle is characterized by blindness without fever. Affected cattle usually die unless diagnosed properly and treatment with thiamine is initiated early in the course of the disease. Polio must be differentiated from lead toxicity, which may cause similar symptoms.

VITAMIN A DEFICIENCY – Unless properly supplemented with vitamin A during the winter, many cattle were deficient or marginally deficient entering spring time. What little green grass was available earlier this spring in some parts of the state may not have restored the vitamin A used up over the winter months, and surely didn't build up any reserves. The longer some areas go without any sustained green grass, the more likely animals are to experience deficiency problems. To avoid developmental problems in calves, and help cows breed back properly, be sure to supplement vitamin A with any supplement you provide while on pasture. The use of ethanol by-products to supplement protein will help stretch available pasture resources, but are not considered to be good sources of vitamin A. If in doubt, add a vitamin A supplement.

AFLATOXINS – Drought-stunted corn is usually much higher in aflatoxin than corn produced under normal rainfall. Beware of bargain corn offered later this fall, especially if

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"If in doubt have the products tested for suspected toxins before purchasing or feeding."

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An excellent website to visit on this subject is: http://www.extension.iastate.edu/ag/drought/ForageDrought2005.pdf

Grain co-products.

Diets can be formulated and fed in drylots or on limited forage pastures using a wide array of grain co-products. In a dry lot situation it is usually advantageous to minimize the amount of feed delivered and the production of manure. Research indicates that cow diets containing as little as 0.5 percent body weight of forage can be successfully fed. Furthermore, limit feeding a fairly high concentrate diet can reduce the amount of feed delivered to cattle by as much as 30 to 40 percent. Grain co-products can be combined with many ingredients to meet cowherd production goals. Fibrous co-products like soybean hulls, cottonseed hulls, sunflower hulls, and to a limited extent wheat midds and corn by-products can alleviate some of the fiber requirement needed by cows. Another advantage is that substitution effects often found with high starch supplements are reduced with high fiber supplements.

Cottonseed and sunflower hulls have been used routinely in feedlot diets to provide rumen "scratch factor". Some nutritionists recommend that soybean hulls should be limited to a 20 percent inclusion rate of the total diet because of the fiber's fermentation characteristics.

Turnips and other unconventional forages.

Brassica crops include turnips, rape, typhon, and kale. These crops will remain green and lush in fall, after most forage crops go dormant if sufficient fall precipitation is received. Brassicas have been used sparingly in Kansas, therefore, most of the information about brassicas is based on work done in other parts of the United States. Both tops (stems plus leaves) and roots (bulbs) can be grazed and are very nutritious. Therefore, they can produce high quality forage and appropriate animal gains on pasture at a time when other forage crops are relatively low quality. Some variance in animal performance when grazing brassicas has been noted and is thought to be caused by differences in intake. For livestock that have not been exposed to turnips it may take 2 to 3 weeks for the animals to become accustomed to eating turnips. Several management strategies can be used to try to minimize the variation in animal performance while grazing brassica crops: First - allow the animals to become adjusted to the brassicas gradually, and second - supply dry hay to animals grazing brassica crops. Brassicas appear to best fit an early to late fall grazing program in Kansas.

Alfalfa

Alfalfa can be an excellent option for high quality forage in the fall. Grazing alfalfa after dormancy is animal safe and high in nutritive value. In fact, the nutrient content of dormant, standing alfalfa is much greater than most beef cows require.

Summary.

There are several options available to increase forage supplies during droughty conditions for Kansas beef producers. Having an open mind, willingness to use unconventional management practices, and understanding the nutrient requirements of beef cattle can help producers maintain cowherd inventories and profits during droughty conditions.

Additional sources of information relating to alternative forages, drought, and beef cattle:
http://www.oznet.ksu.edu/forage/
http://ianrhome.unl.edu/drought/
http://sdces.sdstate.edu/drought/
http://www.uwex.edu/ces/forage/pubs/altcrp.htm
http://muextension.missouri.edu/explore/agguides/crops/g04661.htm
http://agbiopubs.sdstate.edu/articles/ExEx5050.pdf

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you do not know the origin or the test weight is low. Some producers or grain dealers may try to offer this corn for sale at reduced prices. Even though the legal limit for sale of corn for use in feeding cattle is 300 ppb, Diagnostic Labs at KSU and Texas A&M report dramatic reductions in performance anytime corn contains over 100 ppb aflatoxin.

The bottom line is that producers need to consider the potential toxicity problems associated with drought conditions. Beware of bargain feed, either as baled forage or whole corn. If in doubt, have the products tested for suspected toxins before purchasing or feeding.