W 1136

Managing Hay Supplies for the Cow Herd

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Figure 1 (above). Cows eating hay. *Credit: Alabama Cooperative Extension System.*

In some years, especially those with periods of drought, hay supplies are limited for the beef cattle herd. In those years, it is helpful to have a strategy to cope with the situation. When managing short hay supplies, it is important to assess the situation, look for additional forage, stretch hay supplies with supplements, manage feeding and keep an eye on body condition. Further discussion of each of these points can be found below.

1. Assess the Situation

Cull the Herd. This is a crucial time to look closely for non-producers, cows with bad teeth and late calvers. Pregnancy check and do not over-winter open cows. Additionally, you may consider culling cows that wean light calves, have temperament problems or have large frames. Consider saving fewer heifers. When prioritizing heifers to retain, look for those with good foot and leg structure, conformation, and temperament, and ideally retain older heifers that are of average size for your herd (i.e. eliminate the outliers — too big, too small, too tall).

Estimate Hay Needs. A cow can eat 25 to 30 pounds of hay every day and waste a few more pounds, so allow approximately 30 to 35 pounds per day per cow. Allow about half this amount for weanling calves and about three-quarters for yearlings. As a side note, if you are feeding hay from October 1 until April 1, this is six months or 180 days. This could easily be over 5,000 pounds of hay per cow throughout the winter (Table 1).

Table 1. Estimates for hay needs across different animal ages and through the winter.

	Range for daily hay amount	Average daily hay amount	Estimated total hay amount over winter
Weanling calves (less than 8 months)	15 to 17 lbs./cow/day	16 lbs./cow/day	2,880 lbs./cow
Yearling calves	22 to 26 lbs./cow/day	24 lbs./cow/day	4,320 lbs./cow
Mature cows	30 to 35 lbs./cow/day	32 lbs./cow/day	5,760 lbs./cow

Estimate Hay Available. Remember, large round bales often do not weigh as much as we think they should. It is very typical for a "thousand-pound" bale to weigh 800 pounds or less. Bales stored outside on the ground may easily lose 20 to 30 percent of their dry matter. Even covered bales lose 10 to 15 percent dry matter, especially if some of the bales are in contact with soil. If storage conditions are not ideal, adjust the hay inventory to obtain more realistic estimates.

> ***Example with 10 Cows:*** If feeding cows 30 pounds per head per day for 150 days, 4,500 pounds is needed per cow or 45,000 total pounds. Bales weighed 925 in June but lost 15 percent (139 lbs.) in storage and now weigh 786. Divide 45,000 by 786 to see it may take 57 bales to feed these 10 cows. If, however, the bales actually weighed over a thousand pounds and there was little loss, it may only take 40 to 45 bales to feed the same number of cows.

2. Look for Additional Forage

Purchase Hay. Some producers may have hay for sale, but supplies may be tight. Seek out local hay directories from entities such as the Tennessee Department of Agriculture or ask your local Extension county agent for assistance in locating hay.

Consider Forage Alternatives. A popular forage substitute is commercially prepared pasture cubes. These cubes, or large pellets, are fed on clean sod and are designed to substitute some portion of hay. Other possibilities include straw, gin trash or cottonseed hulls. These alternatives (and others) will need careful supplementation to be successfully utilized, as they do not provide much energy value.

Use Crop Residues. When available, crop residue such as corn stover can trim many days off the winter hay-feeding period. Inexpensive, easily erected temporary electric fencing may make this a more viable option in certain situations.

3. Stretch Hay Supplies with Supplements

Start with a Forage Test. A forage test will give a relatively accurate assessment of hay quality and serve as a basis for supplementation decisions. During times when hay supplies are short, it is important to be strategic and precise in the way that we utilize forage resources.

Understand Basic Nutritional Principles that Apply. Understanding a few basic nutritional principles can help when you are trying to stretch hay supplies.

Principle: High starch feeds may depress consumption and utilization of forage. Research shows that high starch feeds, such as corn, fed at as little as 0.4 percent of body weight may depress consumption and utilization of the base forage.

Practical Interpretation: If you feed a lot of corn to cattle, expect them to eat less forage. In free choice forage situations, such as stocker calves on pasture, feeding too much corn can work against converting forage to gain. This fact also often leads producers to avoid feeding more than 5 or 6 pounds of corn to cows on hay or, more likely, to consider lower starch alternatives that may actually improve the utilization of the base forage. These could include soy hulls, commercial mixtures or other lower-starch feeds which still have enough total digestible nutrients (TDN) to help keep cow condition up. See Table 2 for additional guidelines for using alternative feedstuffs.

Principle: Corn may be substituted for hay. High starch feeds, such as corn, do decrease utilization of forages in a free choice forage situation. However, when forage is limited, corn can be used to stretch the hay supply, especially when corn is relatively inexpensive. Always transition cattle slowly to corn over a 7- to 10-day period. The rate of substitution is about 1 pound of corn for 2 pounds of hay. Avoid providing any more than half the ration energy as corn for cows.

Practical Interpretation: Corn can be used as a hay substitute, but other feed sources may be less expensive energy sources and have less negative forage utilization effects. Possibilities include wheat midds, whole cottonseed, soybean hulls, distiller's grains, corn gluten or commercial mixtures containing least-cost mixed proportions of these and other feedstuffs. Substitute at the same rate as corn: 1 pound of feed for 2 pounds of hay. Avoid feeding more than 3 to 4 pounds of whole cottonseed per head to calves or more than 5 to 6 pounds per head to cows, as fat content can inhibit fiber digestion.

Commercial blends are available in several forms, such as pasture cubes, which decrease the need for bunk space. Processing may or may not be needed. For example, many feedstuffs (milo, whole soybeans) must be at least coarsely ground or hammered to make nutrients available but others do not. Most research has shown that only marginal benefits are gained from grinding corn. In fact, fine grinding of corn increases dust and makes it more likely to cause digestive upset. The best argument for using a coarsely ground or cracked corn is that it improves mixing with other ingredients which decreases sorting at the feed bunk.

Principle: Protein often improves forage utilization, especially with low quality forages. Remember, when feeding cattle, we are really feeding rumen microorganisms. Protein requirements of the rumen microbes must be met if forage is going to be optimally utilized.

Practical Interpretation: If hay alone does not meet the protein requirements of the animal, add supplemental protein. For example, adding as little as a pound a day of a 30 to 40 percent protein feed could increase the utilization of the hay and assist in keeping cows in optimal body condition. However, the protein may actually increase hay

consumption if the hay is provided free choice. Suggested supplemental protein feeds include soybean meal, cottonseed meal, corn gluten feed, whole cottonseed or commercial mixtures.

Principle: Meet mineral requirements. Minerals do not have to be expensive to work, but rarely are the cheapest alternatives the best. This is especially true when cattle have been selected for good milk production and improved calf growth. Genetically superior cattle have higher mineral requirements. This becomes even more apparent if nutritional needs are being stretched in a difficult weather situation.

Practical Interpretation: Provide a complete free choice mineral year-round. The mineral should contain calcium and phosphorus rather than just trace mineralized salt. Most mineral programs are formulated to be consumed at a specific rate, usually 2 to 4 oz. per head per day. If you provide plain white salt along with a mixed mineral that contains salt (as most do), then the amount of mineral consumed will be diluted and may not meet total mineral needs.

Pick a supplement that fits the situation. Buying commodity or blend feeds in bulk is generally the cheapest option but there are additional considerations with large feed purchases. Many producers do not have time to carefully balance rations and mix ingredients. Some do not have time for daily feeding. Some products, such as whole cottonseed, are excellent sources of both energy and protein but require considerable labor.

Consider labor and equipment needs when selecting a feed to stretch forages. However, most of the low-labor alternatives cost more. This is termed the cost of convenience. Depending on a producer's situation, a more expensive and convenient feed may be the best option. Conversely, if a producer has equipment from a previous operation (say a total mixed ration mixer from a dairy farm), commodity feeds may be a better option.

Producers with small herds and those with time constraints often do not have storage capacity and are willing to pay higher feed bills for convenience. However, producers who are profit-motivated may utilize various means to store bulk feeds (both commodities and commercial feeds). Self-feeders, bins, gravity wagons, stable that has been converted to a feed box, and commodity sheds, etc. can be utilized to store bulk feed.

Table 2. Suggested Amounts of Various Feedstuffs for Stretching Hay in the Cow-Calf Herd.

Feedstuff	Amount suggested (lbs. per cow per day)	Notes
Corn	5 to 8	1 pound of corn to replace 2 pounds of hay
Corn gluten feed, dry	5	Generally limit to 0.5 percent of body weight; blends well with corn or soybean hulls if higher consumption is desired
Soybean hulls	5 to 10	Can feed even higher, but cost is a factor
Distiller's dry grains (DDG)	5 to 8	8 – 10 percent fat makes energy comparable to corn; research shows it lowers hay consumption
Distiller's wet or moderately wet grains	Same as DDG on dry matter basis, except water increases weight[1]	Price at source is often good relative to dry, but trucking and storage costs may limit utilization
Wheat midds	5	Not as palatable
Whole cottonseed	5 to 6	Can be fed on dry sod; usually handled with front-end loader or scoop shovel, so more labor
Commercial blends	By label, but often between 0.5 to 0.75% of bodyweight	Available in many forms such as bagged or bulk; bulk more economical; useful to include feed additives in certain situations

[1]For example, if feeding a 60 percent moisture product, the dry matter percentage is 40 percent. If you want to feed 5 pounds of dry matter with this product you divide by the dry matter percentage / 100. Therefore, you would feed 12.5 pounds of the feed on an as fed basis. (5 ÷ 0.4 = 12.5)

Use of Ionophores. Ionophores increase feed efficiency by altering the fermentation process. The main energy source for cattle is volatile fatty acids (VFAs). Ionophores allow cattle to produce more energetically efficient VFAs, so the energy status of the animal is improved, resulting in greater feed efficiency. Always follow label instructions when feeding medicated feeds. Ionophores are not regulated under the Veterinary Feed Directive.

4. Manage Feeding

Feed in Hay Rings. Providing this barrier around the hay results in less waste than setting hay bales out on the ground. Consider unrolling hay, but only if the amount that is unrolled can be consumed in one feeding. If too much is unrolled, cows will use the excess for bedding. Cut and remove the strings on hay fed in hay rings. Do not leave the strings in the field, because if they are consumed by cattle they can cause obstructions in the rumen.

Avoid Excessive Mud. Walking through mud burns energy quickly. Many days of this in a row will decrease performance and body condition. Consider using rocky outcrops or old roadbeds as hay feeding areas, if available. You may also consider creating heavy use hay feeding areas with crusher run (combination of coarse and fine aggregate) gravel over geotextile.

Learn *When* to Feed More Hay. This is easier said than done. Sometimes the last 1/4 to 1/3 of a large round hay bale is weather damaged and spoiled and has low nutritive value. Forcing cattle to eat this may cause decreased production or body condition. Conversely, replenishing hay before the cattle have eaten the best parts of previously fed hay is inefficient and can be wasteful in a year with limited hay supplies. Careful observation over time will allow a producer to develop the ability to assess remnant hay quality.

Increase Hay Allotment in Cold Weather. Nothing makes body heat better than microbial digestion of plenty of good hay. The technical term for this heat is "heat increment" or "heat of fermentation." Corn does not increase body heat as well as hay. A little protein may allow cows to better digest hay and increase body heat.

5. Keep an Eye on Body Condition

Understand the Scale. Carefully observe the body condition of the cow herd. The body condition score (BCS) scale ranges from 1 = emaciated to 9 = obese. Strive to keep the herd average in the 5 to 6 body condition score range (minimal to no ribs showing; smooth appearance throughout; noticeable springiness of fat around tailhead and on foreribs; firm pressure required to feel the vertebrae). When too many ribs and backbones are showing, increase hay or supplement. Cows with body condition in the 4 range have been shown over and over to be slower to rebreed or less likely to breed at all. This is particularly true with first calf cows. Figure 2 shows photos and illustrations of cows in a body condition 4 or 6.

Figure 2. Top left: photo of cow with a BCS of 4. Bottom left: illustration of cow with a BCS of 4. Top right: photo of cow with a BCS of 6. Bottom right: illustration of cow with a BCS of 6. *Credit: Oklahoma State University and University of Minnesota.*

Learn the Tradeoffs. Calves born to undernourished cows are likely to be lighter in weight at birth, and more susceptible to scours and pneumonia. Avoid calf losses by making certain that the cows get adequate nutrition. If the point is to survive the year with a short feed supply, one must exercise judgment constantly to maintain the cowherd in reasonable condition so as not to affect future performance, while maintaining acceptable performance under present conditions. Some drastic short-term measures may have to be considered, but also consider the long-term effect and decide if any sacrifices made now can be overcome later before the final decision is reached.

In summary, there are many things to consider when trying to make it through a tight hay feeding season. Understand what the needs of the herd are, what your hay and feed inventory look like, and how to select the right supplement. Reduce waste at storage and feed out to use what hay you do have efficiently. Finally, use body condition scoring as a way to monitor nutritional status and make adjustments as needed.

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