



Back to Basics

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Mineral: A necessary input cost

There wasn't a lot of sun shining in much of the Great Basin and Intermountain West during the month of June. Instead, unseasonably wet weather delivered as much as 4 inches (in.) of moisture to many hayfields during harvest. The result is thousands of tons of rain-damaged or late-maturity harvested beef hay on the market at reduced prices. In this issue of "Back to Basics" let's discuss rain-damaged hay.

Discoloration and bleaching is the least of our concerns relative to rain-damaged hay. In addition to hay harvested and baled with high moisture content posing the threat of fire in the stack due to spontaneous combustion, rain-damaged hay can lose quality in several ways, including mold, loss of protein and energy, as well as damage from excessive heating after harvest.

Reduction in quality is dependent upon many factors, such as how far into the curing/drying process the hay was when the rain was received, how much rain was received, and for how long the rain persisted.

Drying conditions after rainfall stops also affect quality. Plant respiration will take place until it dries to less than 30% moisture. Rewetting the hay will restart the respiration process, which uses carbohydrates (lowering energy value).

We often have to mechanically turn hay to expedite the drying process. This mechanical process often causes leaf shatter and loss of leaves, which, in turn, results in reduced quality.

Wet hay promotes microbial activity and growth, which, in turn, results in lower quality and potentially moldy hay. Certain molds, when fed to livestock, can

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cause abortions in cattle and can cause other health risks, including reduced fertility in bulls. Avoiding the purchase and feeding of moldy hay is always the wisest choice; however, that option is not always possible.

Researchers at Iowa State University (ISU) provide a general guide for feeding rain-damaged hay, yet go on to state that these guidelines should not replace testing of hay. The ISU researchers suggest that newly cut hay receiving a light rain probably loses little quality. Nearly dry hay that receives a light to severe and extended rain may suffer significant quality loss. Dry-matter loss can be up to 5% per inch of rain, while digestibility can decrease up to 10%. The most significant loss will be in energy. Protein will also decrease; however, not as significantly as energy. Vitamin A content will also decrease.

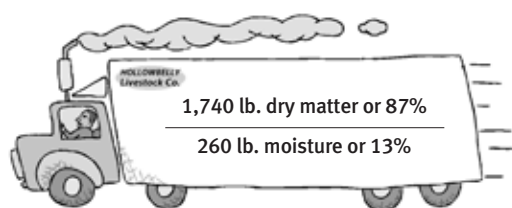
An Oklahoma State University publication points out that mild and long-term rainfall, such as we saw last spring, will leach more soluble
(Continued on page 52)

Pricing Rain-Damaged Hay

Whether you are selling, purchasing or feeding rain-damaged hay, it is important to know what you are dealing with. The best and most appropriate way to accomplish this is to compare price per pound (lb.) of nutrient, not price per ton of feed. This is when an accurate forage/hay sample and analysis will earn/save you valuable dollars.

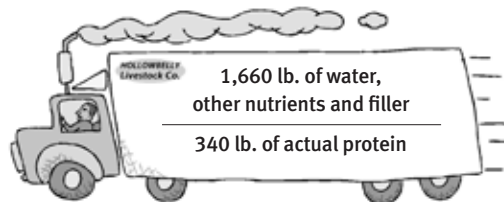
Feeds should not be compared by cost per ton, as this is very misleading. When nutrient shopping, you are normally interested in protein and/or energy. So when you are comparing feeds for specific nutrients, the following guidelines assist in determining the best buy. Don't get caught paying high prices for ingredients used as fillers.

First, determine the dry-matter (DM) content of the feeds to be compared. Do this by multiplying 2,000 lb. by the percent DM contained in the feed as determined by laboratory analysis. This will give you the total pounds of DM in one ton of feed. For example, if a hay sample is 87% DM, multiply 2,000 lb. of as-fed hay by 87% (0.87) DM content, which results in 1,740 lb. of actual DM.

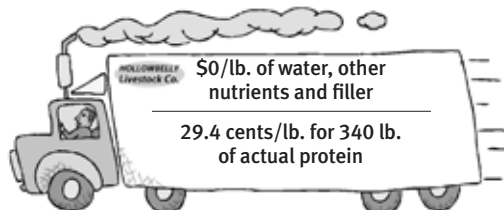


Next, determine the total pounds of a nutrient in

those 1,740 lb. of DM. Do this by multiplying 1,740 lb. by the percent of the nutrient contained in that feed. For example, if the hay is analyzed at 19.55% crude protein (CP) on a DM basis, multiply 1,740 lb. DM × 0.1955 (19.55% CP) = 340 lb. of CP. This leaves 1,660 lb. of water, other nutrients and filler contained in one ton of as-fed feed (2,000 lb. - 340 lb. of CP = 1,660 lb.).



Finally, determine cost per pound of actual protein. Do this by dividing the ton price of as-fed feed (most feeds are priced as-fed and by the ton) by the pounds of actual protein contained in that ton of as-fed feed (\$100 per ton ÷ 340 lb. of crude protein = 29.4¢ per lb.).



In the example above, \$100 per ton as-fed hay with

a protein content of 19.55% (DM basis) has a price comparison shopping value of 29.4¢ per pound of CP.

Factors other than price should also be considered when shopping for feed ingredients. They include but are not limited to:

- Convenience/feed ability — feeding blocks or tubs vs. hay or pellets
- Transportation cost of getting feed to the ranch and storage facilities at the ranch (it will probably cost the same to transport a load of good hay as it will a load of junk hay)
- Cost of feeding the product
- Availability of the product
- Consumption amount required to balance the ration
- Other nutrients required to balance the ration
- Waste
- Salt and mineral content
- Competition when fed (bunk space)
- Opportunity to medicate feed
- Worn and broken teeth on blocks

Remember, not all feed ingredients are equal in nutrient value or price. Therefore, get your feed analyzed so you know what you are buying or selling, and sharpen your pencil to determine the best value that meets your needs. For more information on comparing feed ingredients go to www.unce.unr.edu/publications/other/AlfalfaForBeefCows.xls and utilize the interactive spreadsheet developed by University of Nevada Cooperative Extension.

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carbohydrates and nutrients than intensive short-term rainfall. Up to 50% of the dry matter removed might be soluble carbohydrates. This loss of carbohydrates equates to a loss of total digestible nutrients (TDN), also known as energy.

One year ago beef hay was priced at greater than \$200 per ton. This year we

can buy all we want for less than half that amount. Caution is warranted when purchasing severely rain-damaged hay and utilizing that hay in a beef cow ration. Every hay field is different and the loss of quality is variable. There is no way to establish value or balance a ration until you know what nutritive value is

contained in the hay at time of feeding. Thus, the best advice is to spend the \$30 to \$50 and have hay tested at a commercial laboratory prior to purchasing and feeding (see sidebar stories: "Pricing Rain-Damaged Hay" and "Incorporating Rain-Damaged Hay into Winter Beef Cow Rations").

If you would like to discuss this article or simply would like to talk cows do not hesitate to contact Torell at torellr@unce.unr.edu or 775-738-1721, Foster at fosters@unce.unr.edu or 775-273-2923, McCuin at mccuig@unce.unr.edu or 775-237-5326, or Parsons at cory.parsons@oregonstate.edu or 541-523-6418.



Incorporating Rain-Damaged Hay Into Winter Beef Cow Rations

The authors cannot overstate the importance of analyzing the nutrient quality of hay, especially when considering purchasing or incorporating rain-damaged hay into your winter feeding rations. Knowing forage quality allows us to balance least-cost rations for animals of various ages and groups of animals in various biological cycles of production. Additionally, we can determine what supplements or what quality of hay will be needed to round out the total ration. If supplementation is accomplished through least-cost analysis of the feedstuffs, you may reduce cost and increase performance and profitability.

Feed analysis will also reveal which groups of animals should (or should not) receive the lower-quality feeds. For example, hay that has been damaged by excessive precipitation may produce mold. Moldy hay can be toxic, depending upon the type of mold, and has usually lost most of its nutritional value. Moldy feeds may make cattle go off feed and/or become depressed and, occasionally, can cause abortions and death. Inhalation of certain molds can also cause respiratory disease. Older cattle have a higher tolerance to molds than younger cattle, so eliminating the feeding of moldy hays to younger stock and minimizing the amount of moldy hay fed at one feeding will lessen the risk.

According to research done at the University of Tennessee ("Feeding Moldy Hay to Beef Cattle," James Neel, professor, Department of Animal Science), the effect of the moldy hay can be reduced by feeding a higher-quality hay and grain or commercial supplement. Severely moldy

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To apply for membership in the National Junior Angus Association, visit www.njaa.info and download a printable application, or call 816-383-5100 to request the application.

hay should be diluted to no more than 30% of the ration in order to reduce the risk of mycotoxicosis and reduced performance. Hay with limited heat damage and mold should be diluted to 40%-60% of the total ration. Do not force cattle to consume moldy hay without other forage being available.

In the absence of a forage analysis, assume that the quality is poor and feed only to mature animals. Try to avoid feeding low-quality hay to weaned calves, lactating cows and cows during late pregnancy. Even with these precautions, a nutritional supplement will probably be necessary when feeding rain-damaged or overly mature hay.

Nutritional supplements come in all shapes and sizes and range from commercially produced tubs, blocks or pellets to natural feedstuffs known to be relatively high in protein or energy, such as high-quality hay, soybean meal or corn. Choosing which type is best for your operation will vary according to individual circumstances. In many cases a variety of supplement products will best meet your cattle's needs.

Remember, not all feed ingredients are equal in nutrient value or price. Therefore, get your hay analyzed so you know what you are dealing with. Use this information to your economic benefit to determine the best value that meets your operational and livestock's needs. For more information on comparing feed ingredients, go to www.unce.unr.edu/publications/other/AlfalfaForBeefCows.xls and utilize the interactive spreadsheet developed by University of Nevada Cooperative Extension.