Does Your Hay Make the Grade?

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Stored forage/hay feeding is a common practice for many beef cattle enterprises. But are you getting all the value out of that bale of hay that you expected? Multiple factors affect the value and profitability surrounding hay feeding to beef cattle.

Too often if hay is purchased it is purchased on a $/bale basis rather than $/pound basis. The variation in the weight of bales is the first issue to address. Consider a 1,000 lb bale priced at $40/bale as the basis for comparisons; an 800 lb bale purchased for the same $40 costs 25% more on a dollar per hundred weight basis. Many cattle producers assume they are buying 1,000 lb large round bales, and they are wrong in fact they are receiving much smaller bales and as a result more expensive hay bales. Thus, the cost to provide hay appears to be greater because more bales have to be purchased to meet the pounds of hay required for the cow herd. Large round bales come in a number of different dimensions, couple that with differences in density and bale weight becomes a moving target. We buy and sell cattle based on weight why not hay? Next consider nutritional value measures of Total Digestible Nutrients (TDN) and Crude Protein (CP), two important nutritional inputs for the cow herd. Nutritional information is obtained from a forage test, one of the best uses of money for any cattle owner. Decisions about nutrition can't be made without a forage test. Using our 1,000 lb, $40 bale; every 2% decrease in TDN% equates to a $0.30 increase in the dollar per hundred weight price of energy supplied; so if our basis bale is 55% TDN a bale that is 45% TDN will cost 22% more on an energy supply basis. Meanwhile every 1% decrease in CP% equates to a $6.37 increase in the dollar per hundred weight price for protein supplied; if our basis bale is 10% CP a bale that is 5% CP cost 100% more on a protein basis. Generally, hay is not fed to meet the protein needs of cattle, but low-quality hay ultimately costs money because more supplemental feed is required to meet nutritional requirements. So how does a cattle producer get the information regarding hay bale weight and nutritional content? Hay bale weights can be obtained by weighing a representative subsample of the hay bales that are purchased in every load then take a hay sample of those bales. Work with your local extension agent to facilitate the hay analysis and interpretation.

Now consider the cows do not consume every pound of hay offered to the herd, so there is waste. Hay waste is inevitable and increased by feeding low-quality forage and inadequate hay feeding management. Hay waste comes from two sources: storage loss (Table 1) and feeding loss, both of which are affected by the management decision of the cattle owner. Very often the waste of hay is not included in the total cost of the hay feeding program (Table 2). Hay bales with low TDN and CP increase the likelihood of greater amounts of hay wasted so let's look at the economic outcome of hay waste. Using our 1000 lb, 51% TDN, 8% CP hay bale, a minimal waste figure of 10% increases the TDN cost of hay by $0.87 per hundred weight, unfortunately a figure of 30% waste is not uncommon and increases energy price by $3.36 per hundred weight of TDN. Similarly 10 % hay bale waste increases CP costs by $5.57 per hundred weight, but a 30% waste figure increase CP cost to $21.43 per hundredweight of protein. So to cut down on the hay waste: make/buy well-made bales that are dense, these shed water best and resist weathering losses; store hay in the proper way, under a roof is best if that is not possible on well-drained soil in a north-south orientation, stacked tightly end-to-end; feed hay in a manner that decreases the cow's opportunity to waste the hay (hay rings, cone feeders, unroll the bale).

Hay feeding is an important part of many cattle operations winter feeding program. All too often cattlemen are inadequately informed about the product that they are purchasing or producing. Lost opportunities regarding bale size, nutritional content, and waste occur because we don't weigh a bale, take a sample, or consider how to feed the hay bale. At a time of record calf prices and returns to the cattle enterprise, looking at the input costs will increase that return even more.

Table 1. Estimated effect of round bale size on dry matter storage loss

	Bale Size (ft)				
	4 x 4	5 x 4	6 x 5	7 x 6	8 x 6
Outer layer depth spoilage, (in)	---------- % DM Loss ----------				
2	16	13	11	9	8
4	31	25	21	18	16
6	44	36	61	27	23
8	56	46	40	34	31

Table 2. Effect of storage loss and hay price on associated economic hay value loss

	---------- Storage loss (%) ----------							
	5	10	15	20	25	30	25	40
Hay Price ($/Ton)	---------- Economic loss ($ per ton hay) ----------							
40	2	4	6	8	10	12	14	16
60	3	6	9	12	15	18	21	24
80	4	8	12	16	20	24	28	32
100	5	10	15	20	25	30	35	40
120	6	12	18	24	30	36	42	48

Well-made, dense hay bales maintain their quality during storage and decrease the amount of wasted hay and dollars during the winter feeding period.

Poorly made, low-quality hay is wasted in greater amounts leading to increased winter feeding costs that can be avoided with forage testing and proper hay feeding management.

Comparison of Hay Quality and Value

Bale	Hay Type	Bale Weight, lb	Bale Price, $	TDN, %	CP, %	Storage	Notes
1							
2							
3							
4							
5							
6							