

REDUCING LOSSES AND GETTING HIGH QUALITY FORAGE

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Perhaps this long winter is finally drawing to a close. I don't think I have ever wanted spring to come so badly, and I know you are anxious for it, too. The silver lining is that this past winter has reminded us of several things. First, high quality hay is necessary to keep flesh on cows that are weathering low temperatures, cold rains, and mud. Secondly, storage losses in hay are a major issue affecting our beef cattle industry. In previous articles and as I speak to cattlemen all around the state, I have provided information about each of these subjects. But in this month's article, I hope to present an option that can kill both of those birds with one stone: baleage.

What is Baleage?

Round bale silage (or baleage) is simply baled forage that has been ensiled. The process of making baleage includes cutting the forage crop with conventional hay harvesting equipment, allowing the forage to wilt to 50 – 65% moisture, baling the forage into dense and well-formed bales, and quickly wrapping the bales in plastic so that oxygen is excluded. In the absence of oxygen, the wet forage in the bale does not rot. Instead, it goes through an ensiling process where microorganisms (mainly *Lactobacillus* sp.) ferment the feed and stabilize it by forming lactic acid and other mild organic acids. These acids give the bales the sweet smell of silage and, more importantly, inhibit the growth of other microorganisms (mainly yeasts and mold) that cause rot and deterioration.

Baleage Reduces Total Forage Loss

The ensiling process uses up some of the carbohydrates in the forage, but this loss is inconsequential relative to the savings made as a result of substantial reductions in the losses associated with making, storing, and feeding hay (Table 1). Because baleage is prepared from moist forage, it has much less risk of leaf shatter losses and rain damage (as it usually is cut one afternoon and baled and wrapped the next day). Further, the forage is wrapped in plastic, which prevents losses due to weathering or rot. Finally, cattle usually do an excellent job of eating all of the available baleage that they are given and feeding losses are minimal. As a result, the total losses associated with producing, storing, and feeding baleage are typically far less than that of either hay system.

Table 1. The typical losses of dry matter associated with producing, storing, and feeding grass hay and baleage.[†]

	Harvesting & Baling	Storage	Feeding	Total Losses
Hay, no cover/on ground	7-15%	20-40%	5-25%	30-60%
Hay, under roof	7-15%	2-10%	5-15%	15-35%
Baleage	3-10%	3-10%	4-10%	10-25%

[†] Adapted from data from eight distinct studies performed in the US.

The estimates of total loss in Table 1 enable one to compare the costs associated with these losses in each of the systems. In Table 2, I have listed the amount of total loss that I believe to be typical for these

three systems in Georgia. From this, I calculated the value of these losses for forage valued from \$80 up to \$140/dry ton. This table reinforces the concept that no hay storage system is cheap! But, this table also allows one to better understand the value of baleage.

Table 2. The value of typical total dry matter losses associated with producing, storing, and feeding grass hay and baleage in Georgia.

	Anticipated Losses	Cost of Production (\$/ton)			
		\$80	\$100	\$120	\$140
Value of Losses in the System (\$/ton)					
Hay, no cover/on ground	50%	\$40	\$50	\$60	\$70
Hay, under roof	25%	\$20	\$25	\$30	\$35
Baleage	15%	\$12	\$15	\$18	\$21

One could take this a step further by examining Table 2 a little closer. Let's say that the cost of production is \$100/ton. If the only option a producer has is to store the forage outside (i.e., barn storage is not an option), then the baleage system will prevent \$35 worth of losses per ton of stored forage relative to hay stored outside on the ground (i.e., \$50 - \$15 = \$35). This would suggest that as long as the baleage system added less than \$35/ton to the cost of production, it may be a feasible alternative to storing hay outside on the ground. Of course, these calculations include very broad generalizations and cannot account for all the differences between hay and baleage production systems. Thus, each producer should thoroughly examine the potential impact of this production change using a partial budget analysis.

Baleage Allows Timely Harvesting of High Quality Forage

The second major advantage to baleage is that it allows harvests to be very timely. A good example for this, particularly in the context of the current time of the year (April), is the harvest of excess annual ryegrass. It is frequently difficult for producers in Georgia to cut annual ryegrass at the proper maturity (early boot stage) because hay drying conditions are very poor at that time of year. Our research crew at the NW Georgia Research and Education Center's facility in Red Bud has helped Dr. Lawton Stewart and I evaluate the potential of ryegrass baleage in feeding replacement heifers. Last spring, they cut a pasture of ryegrass that was extra, took part of it off as ryegrass baleage, and let the remainder dry out for hay. We then compared the forage quality and average daily gain (ADG) of weanling replacement heifers provided either the ryegrass baleage, ryegrass hay, or a good crop of 'Russell' bermudagrass hay that was harvested later in the summer. The results are summarized in Table 3.

Table 3. The forage quality and average daily gain (ADG) of replacement heifers fed bermudagrass hay or ryegrass baleage or hay (unpublished data, Calhoun, GA. 2009).

Treatment	CP	TDN	RFQ	ADG
	%	%		(lbs/hd/d)
Bermuda Hay	16.1 a [†]	62.9 b	116 c	1.56 b
Ryegrass Baleage	16.3 a	65.9 a	174 a	1.94 a
Ryegrass Hay	14.7 b	62.4 c	133 b	1.26 b

[†] Averages within a column with a different letter are different ($P < 0.10$). The heifers were provided no additional supplementation.

The ryegrass hay was substantially lower in quality than the baleage. This is largely the result of two light showers (total of ~0.5 inches) that it unexpectedly received while we attempted to dry the hay to a moisture level appropriate for hay storage. Of course, this is a quite common occurrence when attempts are made to make ryegrass hay in the Southeast. By using baleage, the ryegrass was successfully harvested in a way that was mostly independent of the rainfall. Plus, the gains that these replacement heifers made without any supplementation are quite remarkable.

Baleage is NOT for Everyone

There certainly are a number of benefits to utilizing baleage as a system for conserving forage. However, it is important to recognize that baleage is NOT appropriate for everyone. The costs associated with baleage can be quite substantial, and a certain amount of scale is necessary for one to make the system cost-effective. Adopting baleage as a production practice should only be done after a thorough economic analysis has shown it to be cost-effective and practical in the farm operation.

Learn More About Baleage

There will be two events in April that will allow one to better understand how baleage fits within their farm operation. Baleage will be discussed at length at UGA's Hay Production School on April 8-9th in Moultrie at the Sunbelt Ag Expo site. We will also be discussing and demonstrating baleage as part of the Annual Ryegrass Field Day on Saturday, April 10, 2010 at Greenview Farms (Mr. Jonny Harris) near Odum, GA. Registration and program details are available for both of these events on the "Upcoming Events" page on www.georgiaforages.com. Of course, you also are encouraged to learn more about baleage as an alternative forage conservation method by visiting our website at www.georgiaforages.com or by contacting your local University of Georgia Cooperative Extension office at 1-800-ASK-UGA1.