Feeding and Economic Considerations for Baleage use in Cow-calf Diets

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Introduction

Recent years of drought and suboptimal hay-making conditions have left many cattlemen in Iowa and much of the country with either reduced or poorer quality forage supplies, thus resulting in sharp forage price increases over the past 2 years. Feed costs in the cow-calf sector are often greater that 60% of total production costs, with a large proportion of that 60% derived from forage expenditures. Thus, evaluating harvested forage management practices and adopting new schemes that may increase forage quality, as well as reduce dry matter (DM) losses and feed wastage, are essential to minimizing wintering feed costs and maintaining profitability.

Considerations for Feeding Baleage

In the Midwest, the primary factor that influences quality of dry hay that is harvested is weather. In many instances, wet spring weather delays first cutting, resulting in mature hay that is decreased in quality, palatability, and digestibility. If harvest is not delayed, often times the window of opportunity for optimal drying is reduced, resulting in hay that is baled either too wet, or after it has been rained on, again, resulting in reduced quality at the time of feeding. In both of these circumstances, reduced hay quality and palatability will likely lead to increased waste at the feeder, particularly if bales have been stored outside. One managerial alternative that can be used to reduce waste is grinding hay and feeding as part of a total mixed ration (TMR). However, the infrastructure needed to implement a TMR scheme including a feeding apron, fenceline bunks, and mixer wagon may be more costly than a small- to medium-sized producer can justify in the short-term.

If a producer is currently feeding dry, large round bales in a ring or trailer-style feeder, utilization of a baleage feeding system may prove to be less costly than conversion to a TMR system, while still reducing the amount of DM loss during storage and waste at the feeder. In particular, employment of a custom harvesting and wrapping firm would still allow for use of existing infrastructure, without the necessity of upgrading equipment.

Advantages and Disadvantages of Baleage

As with any management system, the pros and cons should be considered prior to implementation. Due to the increased moisture content (40-50% DM) of baleage, the time needed for the forage to cure is drastically reduced when compared to harvest of dry hay, thus reducing the impacts of weather on harvest. In addition, baleage production results in decreased DM and leaf loss during harvest when compared to dry hay. This in turn, results in a forage

source that has increased protein and total digestible nutrients (TDN) when compared to dry hay. More specifically, in a University of Florida Beef Report, Hersom et al. (2007), when comparing Bermudagrass hay with Bermudagrass baleage from the same field, baleage had improved crude protein (12.9%) and total digestible nutrients (57.1%) when compared to bermudagrass hay (10.1% crude protein and 53.8% TDN) on a DM basis.

In addition to increased forage quality, baleage typically results in DM storage losses of only 5-10% (Crop Storage Institute) compared with as much as 30% in hay that is stored outside with no cover (Lane, 2009). Furthermore, due to deterioration and weather exposure, large round bales stored outside may have as much as 25% or more of the bale wasted at the feeder, whereas baleage likely results in 10% or less waste.

Even with the potential benefits of baleage, there are a few drawbacks. Some of these include increased cost per bale due to machinery and cost of plastic wrap, plastic wrap disposal, and spoilage risk if the bag or tube becomes punctured. In addition, because of the added moisture, bales are heavier, and more area is required to store a similar amount of DM compared with dry hay. Furthermore, the added water may limit the markets in which excess baleage can be sold and economically transported.

Utilization in Cow-calf Diets

Due to increased nutritional value and decreased waste at the feeder, baleage may be a cost-effective forage alternative to dry hay in cow diets. Table 1 depicts three hay- or baleage-based wintering rations for beef cows in mid-January in Iowa.

Table 1. Comparison of example beef cow wintering rations using dry hay or baleage[1]

Item	Hay in ring, lb as fed[2]	Hay-based TMR, lb as-fed[3]	Baleage in ring, lb as-fed[4]
1st cutting grass hay	39	25	---
1st cutting baleage	---	---	58
Cracked corn	2	---	1
Modified WDGS	---	7	---
Mineral	0.2	0.2	0.2
Cost/hd/d	$3.12	$2.27	$2.67

[1] Assumes 1350 lb cow, BCS 5, 3rd trimester, maintenance diet. Hay is assumed at $150/ton, corn at $4.24/bushel, MWDGS at $100/ton, and baleage at $88/ton on as-fed basis.
[2] Assumes 25% waste as result of outside storage and feeding in ring, hay at 85% DM.
[3] Assumes 5% waste, limit-fed ration, MWDGS: 60% DM.
[4] Assumes 10% waste of baleage, baleage: 50% DM.

The example rations indicate that when taking into consideration potential waste at the feeder, the non-limit-fed baleage ration is considerably less costly than non-limit-fed hay in bale rings, but is more costly than a limit-fed TMR consisting of ground hay and modified wet distiller's grains. However, it should be noted that these rations do not take into consideration additional

costs of equipment or infrastructure needed for feeding a TMR or baleage production. Such costs of baleage production will be variable depending on type of wrapper (tube or individual) and/or cost of custom harvest and wrapping.

Summary

In conclusion, baleage production results in less DM loss during storage, less waste at the feeder, add increased forage quality compared with dry hay. Thus, baleage-based diets may be a viable alternative to ring-fed hay diets, and may be comparable to limit-fed TMR hay diets when considering equipment and infrastructure needs. However, costs associated with baleage production should be considered to determine true economic viability. Ultimately, the best program for any one producer will be very individualized and depend on local opportunities.

References

Crop Storage Institute. Found at: http://www.cropstorage.com/storage_losses.html. Accessed December 14, 2013.

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