

Hay Storage And Feeding Losses Are Expensive

By Dr. Don Ball

Hay production represents about 28 percent of the cost of beef cow/calf production (which is the single largest expense), according to Auburn University beef cow/calf budgets. This is particularly sobering in view of the fact that the hay feeding period is only a few months. By comparison, pasture costs are estimated at 27 percent, but pasture provides feed over a much longer period of time.

Hay Waste Is Excessive

Most hay in Alabama is put up in large round bales and stored outside, often resulting in huge storage losses. In fact, several studies have indicated that typically 30 percent or more of hay which is stored outside in high rainfall climates such as in Alabama is lost during storage. There are several ways that these losses occur.

Dry matter losses (actual weight loss) of bales occurs due to plant respiration, microbial activity and weather deterioration. When hay is stored inside a barn, losses to respiration and microbial activity for hay are likely to be 5 percent or less if hay is quite dry (16 percent moisture or less) at baling time.

The "rule of thumb" for safe baling of hay is 20 percent or less for rectangular bale hay and 18 percent moisture for round bale hay. At higher moisture contents mold growth will result in higher losses and, if the moisture content is several percentage points higher, it could result in enough heat production to even cause hay to catch fire.

When hay is stored outside and the outer portion is periodically wet by rainfall, dry matter losses are much higher than occur with inside storage. This is especially true for the outermost layer of hay. The depth of this highly weathered hay varies depending on rainfall, type of hay, and length of time that hay is



Photos by Mark Morrison

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stored outside, but typically is 6 to 8 inches. Relatively little weathering occurs on the flat ends of a round bale.

It may seem that a loss of 6 to 8 inches of the outside of a bale doesn't amount to much, but this accounts for about one-third of the volume of a 4.5-by-4.5 foot bale. And, with larger bales, the percentage of weathering loss is less, but the total pounds of hay lost per bale is greater.

Losses on the bottom of bales stored on the ground can be much higher than losses on the sides and top of bales. In fact, in some studies the bottom half of bales were lost on storage sites which were particularly unfavorable. This is because hay sitting on wet soil can wick moisture into the bale from the ground. Obviously, it is extremely important to try to prevent this from happening.

IN ADDITION to dry matter losses, forage quality is also reduced

by outside storage. Research has shown that digestibility of the outside portion of round bales stored outside can be decreased by more than 15 percent, accompanied by substantial losses of crude protein content and sharp increases of fiber content. Rejection of highly weathered hay by animals during feeding further adds to the overall hay loss.

Other Factors

Bale density has an important influence on the amount of hay storage loss because a tight bale sheds water better than one which is loosely baled. Some balers have the potential of making bales which have a density nearly twice as great as other models, but keeping a given type of baler properly adjusted also is a determinant of bale density.

Weather conditions also have a great impact on hay storage losses. Losses tend to increase as rainfall increases, but rainfall distribution is



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important also. For example, a storm which drops a couple of inches of rain in two hours will not be as damaging as the same amount received in small amounts over a period of two weeks. Factors such as humidity, amount of sunshine and temperature also affect hay drying, and, thus the ability of molds and other microorganisms to live within hay bales.

Outside Storage Tips

The first important consideration regarding outside hay storage is to locate a good site. It should be out in the open where sunshine and breezes can dry out the hay after rainfall occurs. In the interest of reducing the risk of fire, a hay stackyard should not be located near any metal object (including fences) or close to upright objects such as trees.

A particularly high priority should be placed on preventing hay from coming in contact with wet soil. Use of items such as wooden pallets, railroad ties, or old tires to store hay on is a good way of providing a barrier between hay and soil. On some farms, crushed rock or a concrete pad might be constructed (or already available) for this purpose. At a minimum, a well

drained area should be selected (a sandy, porous soil is preferable to a heavy clay soil).

It is generally accepted that a space of at least 18 inches should be left between bales to allow good drying and air flow. Storing hay end-to-end (flat sides together), though, is acceptable. If placed on a hill, rows of bales should be perpendicular to the contour so they don't provide a dam for surface water.

Feeding Losses

Studies at Auburn University's Black Belt Substation revealed that feeding losses can be as high as 50 percent under a particularly wasteful situation. Use of bale protectors and minimizing the amount of hay to which cattle have access at one time can greatly reduce hay losses.

Highly porous hay is susceptible to damage and should be fed before hay which is tightly baled. To further minimize losses, hay stored outside should be fed before any hay stored inside a barn. Total storage losses can also be reduced by feeding high quality hay first and then providing supplementation along with lower quality hay which is more highly weathered.

Protect Your Investment

Hay is a logical stored feed for most Alabama cattle producers, but it is also the single largest expense for most. It is likely that many cattlemen do not realize just how much wasted hay is costing them, but it is a serious "money drain" in many cattle operations.

Simply producing hay isn't of much value to livestock producers unless it ends up inside the animals. Excessive waste increases the quantity of this expensive commodity which is required. Hence, taking the time to do a good job of storing and feeding hay can pay big dividends.

(Dr. Ball is an Extension agronomist and teaches in the Agronomy and Soils department at Auburn University.)

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