

Cut Hay Early to Get the Most Out of Plastic Wrapping

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Profitable livestock production is based on good forage management. Forage yield and quality have major impacts on the economics of harvesting stored feed. When the first cut is delayed, forage yield increases, but forage quality and aftermath yield decrease.

If forage quality is too low, some of livestock may need an energy or protein supplement to meet their nutritional needs. The value of livestock product sold and the cost of purchased supplements determine the economics of using supplements to correct for less than optimal forage quality. Because different classes of livestock have different nutrient requirements, the optimal cutting date will depend on the needs of the livestock eating the hay.

Wrapping damp hay in plastic to make it into silage (baleage) is one way to make hay early without having to worry about poor drying conditions in the early spring. However, more will be spent on machinery, labor, and materials. To get the most out of these added costs, it is important to manage for good hay quality.

Hay quality is affected by:

- plant growth stage at harvest
- legume content
- harvest, baling, and weather damage
- plant species

The single most important factor determining hay quality is plant maturity stage at harvest. As plants mature, go to head, and then flower, the forage increases in fiber, reducing the crude protein and digestible dry matter content of the resulting hay. Hay digestibility decreases between 0.33 and 0.50 percentage points per day.

Legumes are lower in cell wall fiber (neutral detergent fiber) than grasses, allowing animals to eat more legume than grass. Animals that eat more hay will gain weight faster or produce more milk. However, when they eat more, more hay is needed to feed the same number of animals if the hay is fed free choice. Legumes are also higher in nonstructural carbohydrates (sugars and starches, which are nearly 100 percent digestible) and crude protein.

Forage will be lower in quality if it is damaged by rain; handled too roughly during tedding, raking, and baling; or stored at a too-high moisture content. The plant can lose 10 percent to 20 percent of its crude protein and dry matter digestibility. Weather damage can have an even greater effect on the hay's yield than its quality.

If hay on the farm does not supply the nutrients the livestock require and the animals are not performing adequately, or if the cost of supplemental feed is too high, the producer may need to improve hay quality by harvesting at an earlier growth stage. This is where using plastic-wrapped baleage pays off.

Testing forage and comparing the reported protein and digestibility to the needs of the livestock is a good way to evaluate the merits of improving forage quality.

To be profitable, a forage-livestock system needs to be low cost. One of the best ways to have a profitable system is to produce low-cost, high-quality forages. Knowing the livestock's nutritional requirements and the quality of the hay helps the producer determine if the quality is adequate. Harvesting at an earlier growth stage will increase quality. For every percentage point increase needed in hay digestibility, the hay needs to be harvested two or three days earlier. Harvesting one week earlier increases digestibility by about 2 to 4 percentage points. Protein content of hay is best increased by harvesting earlier and increasing the legume content in the hay. If grass hay does not have adequate nitrogen for maximum growth, nitrogen fertilizer may also increase the protein content.

When wrapping hay in plastic to make silage, remember that hay quality is determined by the quality of the forage going into the bale. If hay is cut late, the silage will be of poor quality. Ensiling may make the haylage smell good, but it does not improve crude protein content or dry matter digestibility.

Properly managing soil fertility and stand legume content and cutting the hay when it is in the late boot to early head stage of maturity will ensure high-quality hay. Using plastic to wrap the hay as soon as possible after baling will ensure that livestock receive high-quality hay.

Growth stage	Crude protein	Digestible Dry Matter
Pre-joint	0.28 ± 0.04	0.81±0.06
Early head	0.19 ± 0.04	0.70 ± .06
Early bloom	0.13 ± 0.02	0.64 ± 0.05
Post bloom	0.10 ± 0.02	0.55±0.05

Table. Content of crude protein and digestible dry matter decreases as well-fertilized grass hay matures. (Values represent mean ± standard deviation, which is the range that covers two-thirds of the observed responses.)