

New Breathable Film Wrap Improves Consumption

Kevin Shinnners, Garritt Boettcher, Daniel Schaefer and Allison Troutman, University of Wisconsin

In North America, the large round bale is the predominant method used to package dry hay. Round bales can be made for less cost than large square bales and because the bale shape helps shed precipitation, low-cost outdoor storage is possible. However, uncovered bales stored outdoors are subject to considerable losses and deterioration of nutrient composition due to weathering. Additional losses can occur during feeding, mainly due to animal aversion toward the weathered portion of the bale. In one study, uncovered round bales had twice the feeding losses of bales stored indoors (Belyea et al., 1985). The type of bale wrap, which influences nutrient retention in the bale's outer layer, could influence total feeding losses.

To protect round bales from weathering, producers sometimes wrap the bale with a few layers of plastic stretch film. Unfortunately, moisture in the bale can condense at the interface between the bale and plastic, causing mold and algae growth (Shinnners et al., 2009). A new type of bale wrap has recently been introduced to overcome these deficiencies. The new bale wrap is known as B-Wrap™ (www.ambraco.com/B-Wrap/B-Wrap.php). It is applied at baling and is designed to shed precipitation, but allows water vapor inside the bale to escape through microscopic pores. The film is applied by the baler's net wrap system after a few minor system modifications. This breathable film has been shown to reduce round bale DM loss during storage (Shinnners et al., 2010). The goal of this feeding trial was to determine whether the breathable film might also better conserve the outer layer of the bale leading to reduced animal rejection. Breathable film costs an additional \$5 per bale beyond the net wrap cost, but better DM conservation, reduced feeding losses, and improved animal intake would help offset this cost.

Preference Trials

Three different methods of wrapping and storing alfalfa hay in round bales were used to explore possible differences in preferential consumption. Large round bales of alfalfa were stored indoors, outdoors with conventional net wrap, or outdoors with breathable film wrap. Second crop alfalfa was baled in July and bales were removed from storage the following May, so weathering had occurred. Five separate preference trials each of 18 day duration with six 3-day periods were conducted using yearling beef heifers or steers. One-half of the animal's diet consisted of corn silage and the remainder was offered as tub-ground dry hay from the stored bales. Each day individually penned animals were fed corn silage and two types of baled hay in three separate feed bunks. Preferential consumption of hay was determined by weighing of the unconsumed hay the next day. Hay preference was quantified by the number of times one hay was preferred over another; and by the amount of each hay that was consumed across the entire trial.

Averaged across all five preference trials, hay wrapped with breathable film was preferred over net wrapped hay stored outdoors (Table 1). Cattle chose to consume hay from bales with breathable film 15 times out of 18 possible pairings and they consumed almost twice as much of this hay when paired with outdoor stored hay. Averaged across all five trials, preference of hay from breathable film bales did not differ from that stored indoors. This study showed that when bales are stored outdoors, beef cattle will strongly prefer to consume hay conserved with breathable film compared to net wrapped hay. This preference should lead to reduced losses due to hay rejection at feeding. The study did not address animal performance as a result of preferential consumption.

Table 1. Preferential consumption of hay wrapped and stored in three different ways, averaged across the five preference trials conducted (after Shinnners et al., 2013).

Treatments ^[a]		Number of Periods 1 st Treatment Preferred Over 2 nd (18 total)	Quantity of Each Treatment Consumed		Total Amount of Each Treatment Consumed	
1 st	2 nd	1 st preferred over 2 nd	Fraction of treatment consumed within pairing (% of DM fed)		Treatment	Consumption (% of DM fed)
			1 st	2 nd		
BF	NWO	15	65	31	BF	57
BF	NWI	9	49	42	NWI	52
NWI	NWO	13	62	37	NWO	35

^[a]BF: bales wrapped with breathable film and stored outdoors; NWO: bales wrapped with net and stored outdoors; NWI: bales wrapped with net and stored indoors.