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# INFOSheet

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## Hay, Haylage and Treated Hay for Horses

Dr. Bob Wright

Untimely rains during the haying season result in anxious farmers and calls regarding methods of preserving hay as an alternative to dry hay. Under normal conditions, hay is cut, crimped, raked and/or turned to reduce drying time, and then baled. The moisture content of standing hay varies from 65-85%. Hay destined for small square bales needs to be dried below 15% (85% dry matter) before baling for horses, to reduce the chance of dust. The majority of hay is air dried in the field over a 3 to 5-day period. Some producers build hay dryers to enable them to bale hay at moisture contents up to 30%. These dryers mechanically draw dry and often heated air through the bales reducing their moisture level. Square bales will normally lose moisture during storage, resulting in a final dry matter content of about 89% or 11% moisture.

If the hay is destined for baling into round bales, the hay should be field dried to 13% moisture prior to baling. Round bales, baled at 15% moisture level (85% dry matter) or greater, do not lose moisture in the storage period as easily as the smaller square bales and often become dusty. Therefore, hay being baled into a round bale form must be drier before baling.

Dust in hay comes from four sources:

*Leaf shatter dust:* the hay is extremely leafy and very dry. The leaves shatter during the baling process.

*Soil:* dirt is splashed onto the cut hay during heavy rains.

*Molds (mesophilic – grow at 20 - 45°C):* molds and fungi growing on the cut hay during damp/wet periods prior to baling. Very humid days with poor drying conditions that extend over a number of days, or rainfall, promote their growth.

*Molds (thermophilic – grow at higher temperatures, e.g., >45°C):* molds and fungi that grow on baled hay at moisture levels greater than 15%. These fungi grow in the presence of oxygen and sufficient moisture when the hay is heating in the mow or in densely packed round bales.

During a wet haying season, producers often look for alternative forms of forage than the traditional dry hay. Horse owners can consider the use of haylage (bagged or wrapped) and/or preservative-treated hay. These alternatives will allow producers to bale during unpredictable weather conditions and thereby ensure higher feeding values rather than waiting for suitable drying weather before cutting or having hay rained upon.

**Haylage, grass silage, or baleage** are terms given to hay that has been ensiled. Ensiling is a preservation method requiring;

- the cutting of young lush plants (grasses and/or legumes);
- removing some moisture by partially wilting (down to about 45% moisture);

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- eliminating contact with oxygen by placing the material in a container, such as a silo or plastic bag and
- allowing a fermentation process to drop the pH of the material below 5.

At pH 5 and below, bacteria and fungi will not grow and the material is maintained in a stable state unless air enters the bag/container.

In the case of **round-bale silage** (baleage), the hay is baled at about 45-50% moisture and immediately wrapped with plastic, or placed in a bag. The wrapping will prevent further entry of oxygen while the young plants respire using up the remaining oxygen. The pH will drop below pH 5 within a few days. Should the bag become punctured, the haylage will undergo secondary fermentation and spoilage will occur in those areas where oxygen is present. If the forage is baled too dry (25-30% dry matter), incomplete fermentation and higher pH levels occur, and there is a greater chance of growth of undesirable bacteria and fungi. Growth of *Clostridia botulinum* and production of deadly toxins (botulism) can be the result.

**Treated hay** is the name used when a commercially available preservative product is applied to hay. These products are often used on hays between 15-30% moisture and are sprayed on the hay during the baling process. There are two main types of preservatives; those containing an acid, such as propionic, acetic and formic acids, and those containing mold inhibitors.

The **acids** being used today are buffered and are less likely to cause corrosion of equipment than previous products. Propionic and acetic acid are commonly combined. They are produced naturally in the cecum and colon of horses as a result of microbial digestion of fibrous feed <sup>(1)</sup>. These organic acids are potent mold inhibitors. The acids are applied to the hay during baling when it is difficult to dry the hay below 15% moisture content. Studies have shown that heating and molding of hay during storage is decreased with the use of these preservatives <sup>(2)</sup>. However, these products must be applied evenly onto the hay to be effective. Studies have also shown that, when given the choice of dry hay or preservative-treated hay, horses preferred the dry hay. However, when only given treated hay, daily consumption did not decrease <sup>(1,2,3)</sup>. The preservatives, when used properly, allow the storage of hay at a moisture content level of up to 30% <sup>(2)</sup>. Treated hay should not be placed beside dry hay or the dry will absorb moisture from the treated hay and mold.

**Mold inhibitors** are routinely applied to hay in a similar manner as the propionic/acetic-acid products. They are commonly used in hay fed to cattle but no research for horses has been found to compare parameters, such as acceptability, daily consumption and weight gain. Antidotal reports suggest that horses readily consumed hay treated with these products.

## Advantages of Haylage and Treated Hay

- The process of ensiling maintains the quality of the forage as it was cut.
- Digestibility and palatability are not decreased with the use of preservatives <sup>(1)</sup>.
- Usually, haylage is higher in energy and protein because the cutting date is not dependant on the weather (less mature plants with higher carbohydrate and protein content and with less indigestible fibre).
- The high moisture level and lack of dust are useful when feeding a horse with heaves <sup>(3)</sup>.
- Since no ill effects were noted during studies conducted using treated hay, the feeding of treated hay to horses appears to be safe <sup>(1,2,3)</sup>.

## Disadvantages

- There are outstanding unanswered questions, including:
  - the effect of long-term feeding of a preservative-treated (acidic) hay when also feeding high volumes of grain and
  - the possibility of causing colic when feeding frozen silage.

- Handling problems can occur because the bags/bales are almost twice the weight of dry hay (due to the 50% moisture level).
- Individually bagged haylage cannot be moved with the normal bale spears. A grasping unit is required to prevent damage to the integrity of the bags. If the bag or plastic wrap is damaged, oxygen enters and spoilage occurs.
- There is a greater danger of botulism when feeding round-bale silage or bagged silage than when feeding dry hay. Visual appearance of the haylage will not indicate the presence or absence of botulinum toxin. Horses should be vaccinated for botulism prior to feeding round-bale silage or bagged silage.

Since large wrapped round-bale haylage came into common use, there are several reports each year of groups of horses dying of botulism after eating this type of feed. Commonly, the haylage does not look or smell spoiled, but horses eating it develop botulism.

Antidotal findings suggest that haylage baled, bagged, or wrapped drier than the normal 40-50% moisture level are more prone to containing botulism toxin. An increased risk of botulism occurs when:

- a producer, trying to make dry hay, was unable to get sufficient drying conditions.
- a decision was made to bag or wrap the bales when the moisture content was in the 20-30% moisture range. (This is too dry for silage.)
- The pH does not drop below pH 5 within 3 to 5 days of baling, allowing the right environment for growth and proliferation of *Cl. botulinum*.

***Producers should use a hay preservative on hay in the 15-30% moisture range rather than attempt to make haylage by bagging or wrapping the bales.***

For more information on botulism, refer to the information sheet *Botulism in Horses and Haylage*, [www.gov.on.ca/OMAF/english/livestock/horses/facts/info\\_botulism.htm](http://www.gov.on.ca/OMAF/english/livestock/horses/facts/info_botulism.htm)

## References

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