



# U of M Horse Newsletter

Providing research-based information to Minnesota Horse Owners

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Volume 13, Issue 8

August 2015



## Research Update: Crib-biting and Colic

Crib-biting and windsucking behavior in horses has been associated with increased risk of colic. The aims of the research, conducted in England, were to determine the prevalence of colic within a population of horses that display crib-biting and windsucking behavior and to identify risk factors for colic.

Owners and/or managers of horses in England that display crib-biting and windsucking behavior were invited to participate in a questionnaire-based survey about the management and health of their horses. The prevalence of colic was calculated and used to identify associations between horse- and management-level variables for two outcomes of interest: a history of colic ever and a history of colic in the previous 12 months.

Data were obtained from 367 horses. One or more episodes of colic had been observed in 130 horses (35%). A total of 672 colic episodes were reported and 13 colic episodes required surgical intervention.

Increased duration of ownership, increased duration of stabling in the Autumn months (September through November), crib-biting and windsucking behavior associated with eating forage, and horses that were fed haylage were associated with increased risk of colic.

Increasing severity (frequency) of crib-biting and windsucking behavior and increased duration of stabling in the Autumn were associated with increased risk of colic in the previous 12 months.

The prevalence of colic in a population of horses that display crib-biting and windsucking behavior appeared to be relatively high. The results of this study can be used to identify horses that display crib-biting and windsucking behavior who are at increased risk of colic and identifies areas for further research to determine if there are ways in which this risk might be reduced.

For more information on this research, click [here](#).

*Summarized by: Krishona Martinson, PhD, University of Minnesota*

## Ask the Expert: Using Rainwater in Stock Tanks

**Question:** Rain barrels are commonly used to collect rainfall for watering ornamentals. What are your thoughts about using gutters and downspouts to catch rainwater in stock tanks with the goal of watering horses?

**Response:** It is not recommend to use rain barrel water for human or pet consumption, or even for watering root crops and vegetables that will be consumed. There are potential issues with runoff from rooftops in terms of safe drinking water.

Atmospheric deposition of fine metals and particulates can be carried into roof runoff and possibly concentrated in the

rain barrel water, as can petro-chemicals from shingles. New roofs can be especially prone to releasing particulates and chemicals into runoff, particularly when there hasn't been much rainfall for a while and the sun has been heating the rooftop.

In a setting where there may be birds roosting or resting on the rooftop, you can also get significant amounts of bird droppings in the runoff, and that can contain salmonella and other bacteria that can be potentially pathogenic (disease-causing).

*By: Barb Liukkonen (retired), Water Resources Center, University of Minnesota*

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### Upcoming Events

#### 6th Annual Horse Forage Field Day

Thursday, August 20

6:30 to 8:00 pm

St. Paul Campus

\$15 per person

To register, visit:

[www.regonline.com/HorseFieldDay2015](http://www.regonline.com/HorseFieldDay2015)

#### Lunch and Learn Webinar

September 15, 2015

Noon to 1 pm (central)

“Preparing and Managing Arena Footing” presented by Dr. Ann Swinker, Penn State University

To join, click [here](#).

#### Lunch and Learn Webinar

December 1, 2015

Noon to 1 pm (central)

“Feeding Whole Grains” presented by Dr. Marcia Hathaway, University of Minnesota

To join, click [here](#).

Visit our [Facebook](#) page for “Weed of the Week Monday”, “Tip of the Week Wednesday”, “Friday Funny” and other events.

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## Determining the Value of Rained on Hay

Rain occurring while cut hay is laying in the field causes both yield and quality losses that reduce the value of the crop as an animal feed.

Weather-induced losses are caused by:

1. Prolonged plant respiration reducing soluble carbohydrates and overall energy content.
2. Leaching of soluble carbohydrates and certain minerals from the hay.
3. Leaf shattering and loss, removing the highly digestible and high protein portion of the forage.

Several researchers have studied the effects of rainfall on cut alfalfa. Wisconsin researchers measured dry matter losses of 22% when alfalfa was exposed to 1 inch of rain after 1 day of drying. Similar hay dried without rain damage lost only 6% of the initial yield. Losses appear to be greatest after partial drying of the forage has occurred. In a Michigan study, rainfall intensity was kept constant at about 0.7 inches but spread over periods of 1 to 7 hours. Dry matter losses ranged from 4 to 13%, with highest losses occurring when the rain was spread over a longer duration.

Given the same amount of total rainfall, a low intensity rain will result in more leaching of soluble compounds than a high intensity rain. Also, as forage moisture content declines, it is more prone to dry matter loss from rain. In a Wisconsin study, the maximum loss in dry matter (54%) was a treatment where 2.5 inches of rain fell on hay that was nearly dried.

Other species have been studied as well. Yields losses of birdsfoot trefoil appear to be less than alfalfa, while red clover shows even less dry

matter loss due to rain, and grasses suffer the least amount of dry matter losses. Dry matter losses usually represent a significant decrease in income for the farmer, since less hay is available for baling, feeding, and selling.

Three primary factors are involved in dry matter losses; leaching, respiration, and leaf loss. Leaching is the movement of cell solubles out of the plant. Components of the plant that are very water soluble are leached out of the forage and lost when rain occurs. Unfortunately, most of these compounds are those highly digested by the animal. About one-half of the dry matter leached by rain is soluble carbohydrates.

Unlike other livestock, losses of soluble carbohydrate can be beneficial for some horses, including ones diagnosed with laminitis, Equine Metabolic Syndrome or obesity. In order to manage these horses and reduce the amounts of carbohydrates in harvested forage, horse owners have resorted to soaking hay. Purchasing rained-on hay with naturally low levels of carbohydrates is a possible alternative to hay soaking.

Respiration (breakdown of soluble carbohydrates by plant enzymes) occurs at nearly 2% dry matter per hour in fresh forage, and declines almost in proportion to the decrease in moisture content until the plant reaches approximately 60% moisture. Every time the forage is wetted by rain, respiration is either prolonged or begins again in cases where the cured forage was below 60% moisture. In either case, additional dry matter is lost.

In Wisconsin studies, leaf loss ranged from 8 to greater than 20% as a percent of the initial forage dry

matter when rainfall amounts were from 1 to 2.5 inches. In Michigan studies, direct leaf loss was much lower (0.5 to 4%). Experience and common sense tell us that rain damaged alfalfa is more predisposed to leaf shatter after it dries, and rainfall often means additional raking and more lost leaves.

Depending on numerous factors, the digestibility of rained-on hay may decline from 6 to 40%. With the leaching of soluble carbohydrates, structural fibers (acid and neutral detergent fibers) comprise a greater percent of the forage dry matter; therefore, reducing digestibility. However, rainfall has little impact on protein concentration. For rained-on hay, it is common to see relatively high protein values in comparison to fiber concentrations, unless significant leaf loss occurs.

Rained on hay can be a suitable forage, but quality depends on several factors. Forage quality tends to be retained if rain occurs soon after cutting when the forage has had minimal time to dry; the rainfall was a signal event compared to a multiple day or drawn-out event; rainfall intensity was higher versus a longer, lower intensity event; and the forage has not been re-wetted numerous times. Rained on hay is actually beneficial for horses prone to laminitis and other metabolic disorders because of its reduced soluble carbohydrate content.

Analyzing forage for nutrient content is recommended, but can be especially useful when determining the quality of rained on hay.

*Authors: Krishona Martinson, PhD, University of Minnesota and Dan Undersander, PhD, University of Wisconsin*