



U of M Horse Newsletter

Providing research-based information to Minnesota Horse Owners

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Research Update: Bedding Materials

It can be a challenge to find suitable horse bedding materials that provide higher moisture absorption, acceptable animal comfort, good fertilizer values, and improve indoor environmental quality.

Researchers at North Dakota State University set out to determine the water absorption capacity of two bedding materials, flax shive (a newer bedding material) and pine wood shavings which are commonly used by equine facilities. The second objective was to measure ammonia, hydrogen sulfide, and greenhouse gas concentrations emitted from stall surfaces bedded with both materials.

The water absorption capacity of bedding materials were measured at 0.5, 1, 2, 3, 4, 6, 8, 12, and 24 hours in a laboratory. A total of eight horses were used for a 14-day study period. Of these, four horses were bedded with flax shive and the other four were bedded with pine wood shavings for week 1. During week 2, the bedding materials were switched between the two groups. Ammonia and hydrogen sulfide were measured in the stalls. Greenhouse gas measurements were collected 6 inches above the bedded stall surface.

The size of pine wood shavings were much larger than flax shive. The smaller particle size might be a precursor of dust, which was noticed in the stalls bedded with flax shive. The water absorption capacity of flax shive was 56% greater than the pine wood shavings when soaked for 24 hours. There were no differences in ammonia, hydrogen sulfide, and greenhouse gas concentrations between the two bedding materials. Mean nutrient content was similar between both fresh bedding materials, except for phosphorous and potassium. As expected (due to the addition of manure and urine), the nutrient content between fresh and soiled bedded samples for each bedding material were different. Total phosphorus and potassium contents of soiled pine wood shavings bedding were approximately 7 and 20 times higher, respectively, than those of fresh pine wood shavings bedding material. Total nitrogen and total phosphorous contents of bedded flax shive were approximately twice than those of fresh flax shive.

Flax shive shows potential as a new bedding source for use in horse stalls. For more information, click [here](#).

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

Ask the Expert: Winter Pasture Access

Question: Is it recommended to keep horses on pasture once the ground has frozen and there is snow cover?

Response: We do not recommend keeping horses on pasture over winter. There is minimal nutritional value in the dormant/dead grass and legumes. Hoof traffic and continuous grazing can cause considerable damage, which can result in weak plants or bare spots in the pasture the following spring and summer.

Also, some poisonous plant skeletons, like white snakeroot, can remain above the snowline, tempting horses to ingest them. During winter months, keep horses in a dry lot (or sacrifice lot) where they are fed hay, and have access to water and shelter.

As a guideline, turn horses back into the pasture the following spring when grasses are between 6 to 8 inches tall.

By: Krishona Martinson, PhD, University of Minnesota.

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Upcoming Events

Regional Horse Owner Program

November 6, 2014
6:00 to 8:30 pm
Bluff Country Equine
Winona, MN
\$15 per person
Click [here](#) to register

Visit our [Facebook](#) page for "Research Update Monday", "Tip of the Week Wednesday" and "Friday Funny"

Looking for a "speaker" for your next equine function?

Use our free, recorded webinar library!
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Check out our Apps!

"Hay Price Calculator" converts price per bale to price per ton. "Healthy Horse" estimates a horse's body weight, ideal body weight, and body weight score. Both are available for Apple and Android devices for a small fee.

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Blanketing 101

By: Marcia Hathaway, PhD, University of Minnesota

A horse's winter coat can be an excellent insulator, but its insulating value is lost if it gets wet. If the hair is wet or full of mud, air is excluded, reducing its insulating value and increasing heat loss. As little as 0.1 inch of rain can cause cold stress by matting the hair and reducing its insulating value. It is important to keep the horse dry and sheltered from moisture. As expected, a horse with a thicker hair coat can retain more heat. Research has been conducted on the benefits of blanketing a horse to reduce the effects of cold weather.

Most horses are blanketed for various reasons (show schedules) or due to personal beliefs of the horse's owner. However, blanketing a horse is necessary to reduce the effects of cold or inclement weather

when:

- There is no shelter available during turnout periods and the temperatures drop below 5°F, or the wind chill is below 5°F
- There is a chance the horse will become wet (not usually a problem with snow, but much more of a problem with rain, ice, and/or freezing rain)
- The horse has had its winter coat clipped
- The horse is very young or very old
- The horse has not been acclimated to the cold (i.e. recently relocated from a southern climate)
- The horse has a body condition score of 3 or less

It is equally important that the blanket fits the horse. Horses can

develop rub marks or sores where the straps secure the blanket if it fits improperly. If the horse is blanketed continuously, the blanket should be removed daily, inspected for damages, and repositioned. Make sure blankets are kept dry and do not put a blanket on a wet horse; wait until the horse is dry before blanketing.

Keep in mind a horse will continue to develop a natural winter coat until December 22, while days are becoming shorter. Horses begin to lose their winter coat, and start forming their summer coat, as the days begin to get longer on December 23. Blanketing before December 22 will decrease a horse's natural winter coat and may result in the need for winter-long blanketing.

Winter Feeding Strategies for Horses

By: Marcia Hathaway, University of Minnesota

A horse's nutritional requirements change when the temperature dips low during the winter. The ideal situation is to have a horse entering the winter acclimated to the cold with a thick hair coat and fat cover. It has been estimated that a horse with a healthy winter coat and kept dry will be comfortable at temperatures down to 18° F. If the horse has access to a shelter it can tolerate temperatures as low as -40° F.

As the temperature decreases with the onset of winter, the horse requires additional dietary energy in order to maintain its body temperature and condition. For every degree below 18°F the horse requires an additional 1% energy in their diet. The question then becomes, what is the best source of additional dietary energy during the cold winter months? A horse

manages to utilize the dietary energy in the winter to keep warm in a couple of different ways. First, there is the heat given off as a by-product of normal metabolic processes. Secondly, there is the heat generated from microbial fermentation of forages that occurs in the hindgut during digestion.

Many people believe that feeding more concentrates or grains (because they are energy dense), will help keep the horse warmer. However, there isn't as much heat produced as a byproduct of digestion, absorption and utilization of concentrates and grains as there is from the microbial fermentation of forages. Consequently, increasing the amount of forage in the diet will help meet the increasing energy needs and will result in an increase in microbial fermentation which will help keep the horse warm.

For example, if a 1,000 lb horse needed 16 lbs of good-quality hay each day when the temperature was 18° F, its requirement could be expected to increase by approximately 2 to 2.5 lbs to 18 to 18.5 lbs if the temperature dropped to 0° F. The increased dietary energy requirement would be even greater if the horse didn't have access to shelter.

An additional very important point to consider is the need to provide access to clean, "warm" (45° to 64° F) water. A horse will require more water when eating dried feedstuffs like hay, compared to horses grazing on lush, moisture dense pasture. If the water is ice cold, the horse will not drink as much. The goal should always be to maximize water consumption to help prevent the possibility of dehydration and colic.