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WHEN THE SNOW FLIES---ARE YOUR HORSES NUTRITIONALLY PREPARED FOR WINTER?

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As the environmental temperatures begin to drop in the early winter months, horses require additional energy to stay warm and maintain their body condition. The additional energy needs to be addressed by making changes to your feeding practices. This Nutrifax will help you develop feeding practices appropriate for cold weather.

Lower Critical Temperature

Well fed horses adapt well to cold weather and will take between two and three weeks to adapt to cold temperatures. This adaptation involves a reduction in metabolic rate and lower respiratory rates and lower core-body temperatures. Energy is the only nutrient required in excess for horses kept at temperatures below their comfort zone or the "lower critical temperature" (LCT). The critical temperature for most mature horses is below -15 degrees Celsius (C), and that includes wind chill. Growing horses have a LCT of 0 degrees C. When the environmental temperatures drop below this level a horse uses significant amounts of energy to maintain its internal body heat.

For each degree C below the critical temperature, the horse requires 1% increase in digestible energy (DE) to maintain a consistent body temperature. That's equivalent to about 2% more feed per day. Wind chill, coat thickness and moisture can affect the critical temperature. A horse's winter coat is very good at insulating the horse against cold and wind, but that affect is lost if the coat becomes wet. A wet coat can increase the critical temperature by 5 to 10 degrees C. Horses also require additional energy during sudden cold snaps, as they have not been able to adapt to the sudden change in environmental temperatures.

Hair Coat	LCT (degrees F)
wet or short	0
moderate	-5
heavy	-15

Table 1. Estimated lower critical temperature (LCT) for horses in moderate body condition (university of Nebraska)

Water

Horses naturally drink less water when the environmental temperature drops, so it is important to encourage consumption during the colder months of the year. Under warmer environmental temperatures a horse will consume 3 to 7 litres of water per 100 kg body weight, so a 500 kg horse will consume 15 to 35 litres of water on a daily basis. As water temperature decreases, horses will consume less. Horse owners can encourage water consumption in several ways.

Always supply a constant source of clean, fresh water that is not too cold. Although horses will drink cold water, they will consume more when it is warmer, but not hot to the touch. Studies have shown that horses prefer to drink water at 7 to 8 degrees C. Snow and ice are poor substitutes for water as warming them to body temperature is a major drain on energy reserves. For each gallon of water consumed by a horse, 10 gallons of snow will have to be consumed. However, a Norwegian research study (Mejdell *et al.,* 2005) concluded that healthy, mature horses can manage for several days by consuming snow as their sole water source. Snow consumption does result in lower water intake, which increases the risk of impaction, colic and choke. For proper digestion, three litres of water are required for every kilogram of feed consumed. Adequate water consumption is very important in pregnant mares, foals, and senior horses as they are more susceptible to developing dehydration.

Water consumption can be increased several ways:

1. Removing ice daily from troughs to keep water source open.
2. Add 1 to 2 ounces salt to the grain ration, which will change the electrolyte balance in your horse, triggering its thirst response. Horses normally require 1 ounce (2 tbsp) salt daily to replace losses.
3. Feeding hot bran mashes, soaked beet pulp or concentrate. Serving a hot meal doesn't help the horse generate internal heat, but they certainly enjoy consuming them! Avoid feeding more than 2 bran mashes per week as bran contains inverted calcium to phosphorus ratio.
4. Use of a heated water trough.
5. Offer 20 litres of water at 45 to 65 degrees F or warmer twice daily to encourage water consumption.
6. Increase forage intake prior to a drop in environmental temperature. The increase in dry matter encourages the horse to drink more water to aid in digestion.

Forage

The increased need for energy is the major effect of cold on nutrient requirements. So, cold weather feeding simply involves the increase in the amount of calories fed. If additional energy is not provided, the horse will use its energy supplies and hence body weight and condition will decrease.

Forage is the best option for providing excess energy. Bacterial fermentation of fibre in the hind gut produces heat, which helps the horse maintain its body temperature in cold weather. Although concentrates contain more DE per kilogram than forage, the amount of heat produced during digestion is considerably less. During warmer weather, horses require 1.5 to 2.0% of their body weight in forage. For example, a 500 kg horse (1100 lb.) will normally consume 7.5 to 10.0 kg (16.5 to 22 lbs.) of forage daily. Offer free choice hay to your horse to help maintain its body condition in cold weather. If free choice hay feeding is not available, offer 10-15% more hay.

Free choice access of average to good quality forage will supply enough energy to maintain body condition and keep a horse warm during cold weather. Poor quality forage will not supply enough energy on its own and will need to be supplemented with a concentrate. Hay bellies are a good indication of poor quality hay as it contains higher levels of indigestible fibre. If your horse is cleaning up every scrap of hay provided during the winter and is looking thin, it most likely is not getting enough.

Alternative Fibre Sources

If hay availability is limited, feed alternative fibre sources, such as beet pulp or hay cubes. Commercial “complete feeds” or “hay substitutes” are also good alternative options. **EQUILINE® 12.5% Cool Energy Cubits** pelleted wafer cubit ration contains a high roughage level that can substitute a portion of your horse’s daily forage intake. **EQUILINE®** Fibre Nuggets, our highest fibre product, can be used as the sole source of roughage for your horse. Both contain highly digestible fibre sources, such as alfalfa, beet pulp and soy hulls, as well as yeast and balanced vitamins and minerals.

Very old, very young and sick horses have more trouble regulating their body temperature than mature horses. Horses with little body fat or a thin coat have less insulation. All of these horses need to be supplemented with concentrates, in addition to free choice forage. Forage and concentrates should also be increased during prolonged periods of cold temperatures.

Concentrates

Commercial concentrates can be increased in your horse’s diet, but should be gradually added to reduce the risk of colic and laminitis. Ideally concentrates should be fed over

three or more daily feedings to dilute the amount of starch offered throughout the day. Adding fat or a commercial fat supplement to the concentrate can increase its energy density. **EQUILINE® Shine Horse Supplement** is an excellent way to increase the caloric density of your horse's diet, without the added volume or starch. It can be fed at 0.5 to 1.5 kg per day. Feeding additional amounts of concentrate or increasing the caloric density of the diet is especially important for horses with poor body condition or those that are hard keepers. Extra body fat acts as insulation and serves as energy reserves that can be utilized by the horse if it is fed an energy deficient diet.

Body Condition

What is your horse's current body condition? Measure body weight using a weight tape measure at least once a month, if not every two weeks to ensure your horse is not losing weight. Visual estimates are not as accurate. Veterinarians and horse owners often visually underestimate weight by as much as 85 kg per horse! Take those blankets off! A blanket and fuzzy winter coat can easily hide weight loss. Thick winter coats can be deceiving, especially when it is very cold out as the hairs will stand on their end. It is important for horse owners to feel for fat cover over certain body areas, such as the ribcage, shoulders and loin. Use the Henneke Scoring system (available at http://umaine.edu/publications/1010e/) determine where your horse fits in the 1 to 9 body condition score (Table 2). Keeping a record of your horse's weight can inform you of any differences so dietary changes can be made before a dramatic change in weight occurs.

Type of Horse	Ideal BCS
ideal, pleasure and pregnant mares	5 - 7
moderate to intense performance	5 - 5.5
growing horses	5.5 - 6.5

Table 2. Suggested body condition score (BCS) of horses based on the Henneke Body Condition Scoring.

If your horse tends to lose body condition during the winter, try increasing its body weight prior to the winter months so it can lose some weight during the winter without getting too thin. Subcutaneous fat acts as insulation to help maintain body heat, so a moderately fleshy horse will fare better in the winter than a thin horse.

Make sure horses at the bottom of the social hierarchy have adequate body condition as they tend to have a lower feed intake because more dominant horses will limit their access to feed. When horses are involved in group feeding, several piles of forage should be spaced out evenly throughout the pasture or lot. Providing two or more extra

servings to the group will give the horses more options, particularly to the more timid horses being bullied by another horse.

Summarized tips to effective Nutritional Cold Weather Management:

1. Monitor weather forecasts to determine cold weather periods in advance.
2. Increase forage intake a minimum of 24 hours prior to the forecasted cold conditions. Increase by 2% for every degree C below the LCT or feed free choice.
3. Monitor your horse's body condition on a biweekly basis.
4. Increase forage intake to horses in good body condition and "easy keepers".
5. Increase forage and concentrate intake for horses with poor body condition and "hard keepers".
6. Supplement fat to increase the energy density of the concentrates, without adding more bulk.
7. Provide warmed water daily to encourage consumption.
8. Add 1 to 2 ounces salt to the concentrate ration to trigger the horse's thirst response.

References

Lewis, L. 1996. Feeding and Care of the Horse. 2nd Ed. Lippincott Williams & Williams, Media, Philadelphia.

Mejdell C.M., E. Simensen, K.E. Boe. Is snow a sufficient source of water for horses kept outdoors in winter? A case report. Acta vet. Scand. 2005, 46, 19-22.