



# Horse Feeding Management

## Cold Weather Feeding Practices for Horses

*Special management practices are required during the winter to ensure the health and proper body condition of your horse. This fact sheet will help you to develop feeding practices appropriate during cold weather.*

### The Impact of Cold Weather

During cold weather, the horse requires additional energy to maintain its internal body temperature and keep warm. The exact amount of energy depends on the severity and extent of the cold period. In the Carolinas, horses typically experience a dramatic drop in temperature for 1 to 3 days followed by a return to moderate, normal temperatures. When environmental temperatures (including wind chill) drop below 45°F (referred to as the *critical temperature*), significant amounts of energy are used by the horse to maintain its internal body heat.

The amount of energy required by the horse to meet daily energy needs is measured as digestible energy (DE) in calories. The critical temperature can be used to estimate increased energy needs which the horse must obtain from its diet. For each 1°F decrease below the critical temperature, the horse requires a 1% increase in digestible energy to maintain a consistent body temperature. Wind chill, moisture, and coat thickness will affect the critical temperature. The horse's thick winter coat has an insulating effect against cold and wind. If the coat becomes wet, the critical temperature will increase by 10 to 15°F.

The following formula is used to calculate the increased DE requirement for a horse as a result of cold temperatures and wet, windy conditions: *critical temperature – actual temperature = % increase in DE required.*

### Adjusting Energy Intake: An Example

The following example clarifies how to adjust energy intake for a dry environmental temperature of 30°F with a wind chill that results in an actual temperature of 25°F. The

example applies to a 1,100-pound horse at maintenance.

#### Step 1.

Subtract the actual temperature (including the wind-chill adjustment) from the critical temperature (accounting for wet conditions if necessary):  $45^{\circ}\text{F} - 25^{\circ}\text{F} = 20\%$  increase in DE requirements.

#### Step 2.

Because a 1,100-pound horse at maintenance requires 16.4 Mcal of DE per day (see AG-558-1) and because the horse in this example requires a 20% increase in DE, you multiply as follows:  $16.4 \text{ Mcal} \times 20\% = +3.28 \text{ Mcal}$  increase. The requirement thus increases as follows:  $16.4 \text{ Mcal} + 3.28 \text{ Mcal} = 19.68 \text{ Mcal DE/day}$ .

#### Step 3.

Next you need to determine the amount of feed necessary to supply these increased calories. A 1,100-pound horse typically consumes 19 pounds of ration daily (1.7% of its body weight). Because the recommended DE level of the ration (concentrate mix plus forage) fed to a horse at maintenance is .90 Mcal DE/lb of feed, we can calculate the increase in feed as follows:  $3.28 \text{ Mcal} \div .90 \text{ Mcal} = 3.64$  pounds of additional feed to provide 19.68 Mcal DE/day.

#### Step 4.

Determine the total amount of feed the horse requires by adding the 3.64 pounds of additional feed to the 19 pounds of feed the horse requires under normal conditions:  $19.0 + 3.64 = 22.64$  pounds per day of total ration.

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## The Importance of Hay and Fat

Feedstuffs vary in the amount of internal heat produced when digested by the horse. Forages, which are digested by microbes located in the cecum and large intestine, produce more heat than concentrate mixes, which are digested by enzymes in the small intestine. Although concentrates contain more total DE per pound than hay, the amount of actual heat given off by the digestion process is significantly less. Thus, the best way to increase internal body heat while maintaining a safer, more consistent energy intake is to increase the intake of hay. A horse should consume at least 1.5 to 1.75% of its body weight as hay during cold periods. Thus, a 1,000-pound mature horse should consume 15 to 17.5 pounds of hay daily to meet critical temperature needs during cold weather.

During prolonged periods of cold temperature (several days below the critical temperature), both the concentrate and forage portion of the diets should be increased in equal proportions. The energy density of the concentrate mix can be increased by adding fat in the form of 4 to 8 ounces of a vegetable oil per day, or by the addition of a commercial fat supplement according to label recommendations. Feeding of additional amounts of concentrate or increasing the energy density of the concentrate is especially important if the horse is in poor body condition with low body fat or is a "hard keeper." The extra body fat provides an additional insulating effect against wind and also serves as an energy reserve that can be used when the horse is fed an energy-deficient diet.

## The Importance of Water

Maintaining ample water intake is the most critical part of ensuring the health of your horse during cold weather. The horse prefers a water temperature of 45° to 65°F. Under normal conditions, the horse will consume one gallon of water per 100 pounds of body weight. A 1,100-pound horse will consume 10 to 12 gallons of water daily. As the water temperature decreases, the horse will consume less water. The same 1,100-pound horse may consume as little as 1 to 3 gallons of water daily when water temperature is 32°F.

Low water intake is directly related to the increased incidence of impaction colic. Water intake can be encouraged by increasing the amount of forage being fed prior to a drop in temperature. The resulting increase of dry matter encourages the horse to drink more water.

Concentrate mashes should be fed during the actual cold period when water temperature is below 45°F. Feeding 2 to 3 gallons of hot water daily mixed into a mash with a textured or pelleted concentrate mix will provide additional water intake. To avoid gas colic, allow the mash to sit for 15 minutes; this will permit the feed to expand prior to feeding. If possible, offer 10 gallons of water (at 65°F or warmer) twice daily. Break and remove ice from water tubs, making certain to provide water that is available free-choice.

## Ten Steps to Effective Cold-Weather Management

- Monitor weather forecasts to determine cold periods in advance.
- Increase the dry-matter content of the diet 24 hours prior to forecasted cold conditions.
- Strive to keep your horse in good body condition prior to winter months.
- Determine your horse's critical temperature and adjust DE intake accordingly.
- Increase hay intake to horses in good body condition and "easy keepers."
- Increase forage and concentrate intake for horses in poor condition and "hard keepers."
- Supplement fat to increase the energy density of concentrates.
- Feed the same concentrate as a moist mash during cold periods.
- Offer 10 gallons of warmed water daily.

## For Additional Information

The following titles in this series are available from your county North Carolina Cooperative Extension Center:

- AG-558-1, Nutrient Requirements for Horses
- AG-558-2, Estimating Body Weight in Horses
- AG-558-3, Selection of Feedstuffs for Horses
- AG-558-4, Water Intake, Sweat Production, and Electrolyte Supplementation in the Horse
- AG-558-5, Interpreting Horse Feed Analysis
- AG-558-7, High-Fat Diets for Horses

Additional titles are also available in the *Mare and Foal Nutrition Series*. Contact your county agent for additional information.

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