Sugars in Pasture Grasses: Not All Horses Should Graze

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Recently, there has been a significant amount of interest in the sugar content of forage grasses. Pasture-induced laminitis (founder) can be triggered when susceptible horses ingest high amounts of sugar or fructans naturally found in forage species commonly grown in Minnesota. Susceptible horses include, but are not limited to, overweight or easy keeping horses, ponies, horses with metabolic syndrome, and horses that have foundered in the past. These horses should have limited grazing, or no grazing at all.

Sugar content depends on weather, plant stress, forage species, species maturity, time of day, and time of year. Any time forages are photosynthesizing, plants are producing sugars. When growth is limited from temperatures <40°F or from drought, sugars normally used for growth will begin to accumulate in plants. During these plant stresses, susceptible horses should not graze. Minnesota's cool spring and fall weather can cause sugar accumulation, and increase the risk of pasture-induced laminitis for susceptible horses. A better time to graze is anytime forage species are using sugars for rapid growth during warm weather or during respiration (using energy during dark periods). However, laminitis in susceptible horses can still occur if over-eating is allowed. Better times to graze include cloudy days and dark hours.

If grazing is tied to exercise, consider using a grazing muzzle to limit amount of forage the horse can ingest, and restrict grazing to periods when sugar content should be lower. Specifically, graze between 3 a.m. and 10 a.m., on cloudy days, and during periods when night temperatures are $>40^{\circ}$ F. Grazing in areas shaded by trees or buildings may allow longer access to grass as sugar accumulation will be less. Allowing pasture grasses to become more mature should also reduce sugar content and will result in less (and a slower) intake. Grazing during these times or scenarios do not guarantee sugar content will be lower.

There are other factors to consider that contribute to sugar content. Some pasture species have a higher genetic potential to accumulate sugars under stressful conditions than others. These species include timothy, bromegrass, orchardgrass, and most cool-season grasses that are commonly used in horse pastures in Minnesota. Most forage species store sugars in the bottom 3-4 in. of growth. Making sure pastures are not over-grazed will help to avoid laminitis. Forage species store sugars when they are under stress. Make sure pastures are properly fertilized and avoid grazing susceptible horses during drought and in the fall when nights are cool ($<40^{\circ}$ F). Keeping horses regularly exercised and in good body condition will help to reduce the risk of pasture induced laminitis as well. Not all horses need to follow these recommendations, but susceptible horses should. Some horses should not be allowed to graze because their risk of foundering is too great.