



NUTRITION NOTES

Innovation + Research from Kent Nutrition Group

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EFFECT RAIN ON FORAGE QUALITY

The quality of a hay crop declines with advancing maturity. Much of its nutritional value is derived from the leaves. As the plant matures, it increases in height and the amount of leaves relative to stem declines. This results in greater concentration of the fiber components, such as neutral detergent fiber (NDF), acid detergent fiber (ADF) and lignin. Without these, as the plant grows taller, it would not continue to stand. As the leaf-to-stem ratio goes down the digestible dry matter, protein, and energy fractions also decline. As cows consume diets containing forages higher in NDF, total dry matter intake tends to decline. Lower dry matter intake generally requires increased grain concentrations in order to maintain nutrient intake. This becomes a vicious cycle where; as more grain is added, there is less room for forage, which again requires more grain. In the best-of-years, it becomes a balancing act to harvest for optimal quality yet maximize yield. It is best to harvest grasses in the “boot” stage and alfalfa in the bud to very early bloom stage.

If first cut forages have had the added insult of being rained on before being chopped or baled, there are consequences. The longer it takes to wilt, the greater the likelihood is that it will get rained on. Hay, therefore, is at greater risk than is silage. Rain will leach soluble nutrients and reactivate plant respiration. Respiration losses occur from the breakdown of nutrients by plant enzymes and aerobic microorganisms while the crop is exposed to oxygen. Unfortunately, the nutrients that are lost are those that are most available to the cow, including sugars and non-protein nitrogen sources. The magnitude of the loss is dependent upon the amount of rainfall, plant species, and how long since cut. With increasing amounts of rain and greater wilting time prior to the rain, losses are greater. With legume crops, rainfall during wilting also causes significant leaf shatter and loss. Also, if additional tedding or raking is necessary, further leaf loss also occurs. As the crop lies in the field, it also increases the risk of yeast and mold growth. This leads to further nutrient loss and possible mycotoxin production.

To beat the rain, sometimes the crop is ensiled at higher than 70% moisture (30% dry matter). Hay crop silages ensiled this wet often experience clostridial fermentation. Clostridia are undesirable bacteria that are present in the soil and can be introduced into the forage when harvested. During normal fermentation, pH quickly drops to 4.5 or less, at which clostridia do not thrive. Clostridia produce large amounts of ammonia and butyric acid, causing a rise in pH to greater than 5. Quality hay crop silages will usually test less than 15% ammonia nitrogen and less than 0.1% butyric acid. Higher levels may indicate clostridial fermentation. Large amounts of carbon dioxide and hydrogen gas are also produced, representing DM and energy losses. These forages will have a strong, rancid smell and when fed will cause a significant drop in DM intake and possible significant health problems. To prevent herd health problems, silages suspected of clostridial problems should be allocated to late lactation cows or heifers.

We can do nothing about the weather. That’s probably a good thing! We can recognize, however, that harvesting a mature hay crop will yield feed of lower quality. We can and should plan for this. Finally, despite weather forecasts, getting over anxious and ensiling wet feed will be counterproductive and should be avoided.

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