

# Northwest Veterinary Associates Newsletter

November 2020

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I was performing an LDA surgery the other day and was conversing with Ryan, one of our very knowledgeable dairy clients. He had mentioned that this particular animal had been “chewing her cud”, or ruminating, and was surprised when he had heard the ping of her displaced abomasum. His comment quickly brought my memory back to the time when I had started my career, here in Franklin county, VT, as a large animal veterinarian. I too had been amazed when I had diagnosed a cow with an LDA that was clearly ruminating. How could that be? I thought that only healthy cows chewed their cuds.

As I drove home from the call, I got to thinking about this. Another client of ours had installed a rumination monitoring system and was using the information to help keep tabs on his herd health status. Between what he had learned to date about his new system, and a conference that I had recently attended, it dawned on me that many sick cows still ruminate. The difference here is the reduction in the amount of time she spends in a day ruminating when the cow is sick.

So why do cows ruminate? The rumination process allows these animals to eat forages and other high fiber feeds that are not able to be eaten by humans and other non-ruminant animals. Ruminants have a rumen, which is their largest stomach compartment. Along with the reticulum, the two work together to allow a cow to ingest large amounts of feed, be it grass on pasture, or TMR, and then regurgitate the feed for further feed breakdown, and then passage into the rest of the gastrointestinal tract for better digestion and nutrient absorption. Cud chewing also stimulates saliva production to help buffer the rumen pH and helping to reduce the risk of acidosis.

Another benefit of rumination to the cow may be related to sleep. Researchers have studied this in cattle and have determined that cows only sleep about three to four hours per day. Back in the 1970's, researchers also looked at brain EEG patterns in the cow and discovered that during rumination, patterns were very similar to those seen during sleep or somnolence. From the studies, it was surmised that rumination offers to cattle the physiological benefits provided by deep sleep. This helps explain, to me, anyway, why some cows look totally “out of it” as they lie and chew their cuds!

Cows typically spend about one-third of their day, or eight hours, ruminating. It occurs at all times of the day, but we do see cows chewing cuds more frequently at night and following feeding. Rumination is more likely to occur when cows are lying down, making it important to ensure that dairy cattle have adequate and comfortable stalls to rest in. A 2% increase in resting translates into a 7% increase in cud chewing. Another interesting fact is that cows have a significant drop (up to 70%) in rumen activity starting about six days pre-calving and then rebounding to normal within two weeks post-calving.

Rumination is controlled by internal factors within the rumeno-reitculum. These include primarily nutritional things like scratch, or NDF, as well as starch levels in the diet. Rumination time is positively related to forage-NDF and negatively associated with diet intake of starch and sugar. It is also controlled by external environmental factors, primarily those related to management. These include stocking density, heat stress, excessive headlock time, and mixed parity pens (milking heifers in same group as mature cows).

We know from the data collected from different rumination and activity monitoring systems that cows average between 450-550 minutes per day ruminating. Studies have been done using this baseline information looking for associations between rumen activity and health issues in transition dairy cattle. One such study observed rumination and activity data from cows five days prior to five days post-calving, as well as the development in those cows of DA, ketosis, and indigestion. A clear pattern emerged showing that the majority of cows that developed these ailments after calving showed a decrease in rumination before, during and after calving. Cows with an LDA showed the most drop, 50-60% reduction, with moderate ketosis being less severe, 35-40% decrease, and light ketosis showing just a slight drop, 10-18% drop, when compared to healthy cows. These decreases in rumen activity were seen up to three days before other signs seen in a sick fresh cow (i.e. high BHBA, ping, milk drop, etc.). Cows with other health issues, such as metritis and lameness have also shown similar responses in rumination.

Several herd management factors have also been looked at. One is grouping strategies looking at activity in first lactation animals. By separating heifers into their own milking group, they were seen to increase their ruminations from 363 minutes per day to 428. Heat stress has also been looked at. With an increase in air temperature from 77 to 104 degrees F, eating decreased by 46%, standing time increased 34%, and rumination time decreased 22%.

In conclusion, a cow that is seen chewing her cud, may not be without issues. As these technologies become cheaper, they hopefully will become more common place. It can be used to monitor individual animals, as well as group and herd monitoring. Remember that a healthy rumen means a healthy cow. We should do all that we can to help her keep it that way.



Hope you have a healthy and safe Thanksgiving! We are thankful for all your support.