In a world of smart phones, GPS and precision technology, dairy cows are quickly becoming part of the emerging technology. In the past, dairy farmers were often tipped off to trouble in the herd when they saw a drop in milk production. The drop could have been caused from a change in eating habits, activity levels, sickness, or a variety of other conditions. Now, however, with the use of precision diary sensors, we are able to track eating habits, activity levels and physiological conditions in hopes of better understanding behavior and overall health.

At the West Central Research and Outreach Center (WCROC), we installed Heatime® HR Tags from SCR Dairy on 92 organic cows, and 8 conventional cows in the spring of 2013. This system allows us to track rumination (chewing) in addition to monitoring activity levels of cows. The tags allow us to “listen” to our cows 24 hours a day, even in the middle of the night when nobody is around. Our tags are the “HR” style, meaning they measure both rumination and activity, giving extra confirmation that cows may be sick or in heat. Like many other activity monitors, ours use an accelerometer to gauge our cows’ daily movement. Unique to the HR Tag, we are also able to monitor rumination through a microphone installed around the neck. This microphone is actually picking up jaw movements as bones rub together during rumination. Rumination is measured in minutes of rumination per day. So far, we’ve gathered over 150,000+ data points.

Activity and rumination is typically observed in two hour time blocks. The graph shows the raw activity and rumination average per 2 hours. Activity (red line) and rumination (blue line) patterns mirror each other; at night, the activity is low and rumination is high and vice versa during the day. Activity is at the highest in the evening (4:00-8:00pm), which is mainly because the cows are walking to and from the milking parlor. On average, our cows are ruminating 400 minutes per day, which is typical of most dairy cows.

Beginning in May of 2013, our HR Tag readings showed high activity levels due to the cows moving out to pasture. Once the cows were moved closer to the milking parlor in June, activity
levels decreased due to the cows close proximity to the parlor. On June 15, the cows moved to pastures farther from the barn, and thus activity increased again. Cows grazed sorghum-sudangrass for the first time on July 17, and the activity spiked remarkably. That particular day, the cows were grazing on grasses they had never grazed before, and thus the roamed the pastures a lot until they realized they could eat the sorghum-sudangrass.

In the future, we will be evaluating other activity and rumination systems for cows, and hope to provide valuable information to dairy producers that install these activity and rumination monitoring systems. To learn more about the dairy research program at the WCROC, please contact Brad Heins at hein0106@umn.edu or visit wcroc.cfans.umn.edu.