The industry is in the midst of a new heat detection discovery era. It focuses on cow behavior and biological information, as well as data collection and interpretation, to track individual cows and identify the timing and need for reproductive management actions. As a result, activity monitoring and rumination monitoring systems are gaining in popularity on dairy operations.

Activity systems are based on the premise that when animals experience estrus, ovaries secrete mostly estrogen and little or no progesterone. This hormonal environment makes the brain stimulate physical activity in the animal.1

Using microchip and computer technology, individual animal activity is tracked and then reported to data collection software on a timely basis. Baseline activity measures are established for each animal and as additional data enters the system, managers can identify deviations from “normal” to determine which cows require management action. In addition to heat detection, the data offers insight into other health parameters, including lameness and early identification of metabolic issues in transition cows.

A field study2 published in the October 2012 Journal of Dairy Science found time to pregnancy was not different or was shorter with an automated activity monitoring system compared with a timed-artificial insemination (A.I.) program where 19% to 32% of total inseminations were based on observed estrus.

The trial followed the reproductive performance of three herds over one year. The authors concluded the differences between treatments were greater when considering only inseminations based on automated activity monitoring or timed-A.I.

**EVEN MORE INFORMATION**

Some systems take monitoring to an additional level and allow dairy producers to track rumination too. Again, once individual cow baselines have been established, this technology enables dairy management teams to see deviations from normal behavior. Rumination is an indicator of a properly functioning rumen, and an excellent gauge of animal health. Dairy producers, veterinarians and nutritionists have long relied on cud chewing as a key monitor of dairy cow health, but until now, rumination hasn’t been an easy parameter to track.

A research trial3 published in the December 2009 Journal of Dairy Science compared electronic rumination monitoring with visual rumination observation and found the electronic system results were highly correlated with those of visual observation. Monitoring rumination with an electronic system also provides a numerical value for each day’s rumen function, and compares it to the individual animal’s average.
One advantage of this additional information is that these data can help identify cows with lower prepartum dry matter intake. This is important because cows with lower rumination time before calving also often have lower rumination time after calving—and suffer a greater frequency of disease than cows with higher rumination time in late pregnancy. Diseases that occur during the transition period can play a key role in reproductive performance during the upcoming lactation.

**DECISION DATA**

Dairies using the systems report that the monitoring reports have several tiers of decision-making usefulness. They can be used to:

- Track individual cows
- Monitor pens of cows
- Identify problems or changes within cohort groups

This ability means producers can be more effective with their time and resources, and can quickly improve on health and reproductive protocols with information that’s not been previously available. By monitoring data trends, they can rapidly determine appropriate interventions and the timing of these actions to the benefit of individual animals and to the betterment of their whole herd.

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**SAVING TIME AND EFFORT**

More efficient use of time and resources is one big reason dairy producers are investigating and installing the activity and rumination systems.

For instance, before Funk’s Midway Dairy of New Munich, Minnesota, installed an activity and rumination monitoring system, the dairy’s employees would note at 10 p.m. which cows appeared to be in heat. At 2:30 a.m., the Funks checked those notes and did their best to guesstimate the state of heat.

“That was a tough process; human error made it difficult,” recalls co-owner Karl Funk. “Now we just work with the system. The program tells us when to breed, so we are phasing out having employees check for heat.”

Trent Bowman has obtained similar results on his family’s dairy in Hagerstown, Indiana.

“We used to watch heifers two hours a day to see who’s in heat, but now I spend maybe 10 minutes. You look at the charts, you sort and you breed,” says Bowman, co-owner of Bowman Dairy Farm. Each morning and evening the herd manager uses the heat report to make breeding decisions. Bowman and his team review the health reports every morning to identify cows that might need extra attention.

Additionally, “The other numbers that we won’t see until the second year are our calving interval and our pregnancy rate,” says Bowman. “Our pregnancy rate keeps increasing, so we’ll see fewer days in milk and a shorter calving interval. I fully expect to bring the interval down by 10 – 15 days, which will increase our milk sales by 2 – 3%.”

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