Automated Heat Detection May Change the Way You Breed Cows

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Recent advances in heat detection and heat detection technologies are leading many producers to reconsider their current reproduction program. Automated estrus detection is becoming more and more popular throughout the industry mainly because of the decreased need for labor with these systems. Synchronization protocols call for several shots throughout the protocol and require quite a bit more labor when compared with automated systems.

Automated Estrus Detection Systems

Several commercial activity monitoring systems are currently available in the US. There are two main technologies used to monitor activity. Pedometers simply measure steps taken. The pedometers establish a base-line of normal activity, and using that base-line, a formula calculates an increase or a decrease in activity. A decrease in activity could be a sign of illness or lameness. Accelerometers on the other hand measure a few more variables. Accelerometers measure three different movements: side to side, up and down, and front to back.

Below are a few systems available in the United States and throughout the world. The University of Kentucky does not endorse any of the systems, and is not promoting any one system over another. The following is a small list and is not intended to be exhaustive.

AfiMilk®

The AfiAct system is a part of the AfiMilk system. The system collects activity data from a pedometer attached to the cow’s leg. The program can be used as a stand-alone system or as a part of the AfiMilk system for milking parlor data, production monitoring, and fertility management. Their latest technologies also offer resting time along with the activity monitor all in the same tag.

Select Detect™

Developed by Dairymaster and Select Sires, Select Detect uses neck-mounted activity monitors. The data is wirelessly uploaded periodically to a base station, and the software downloads the data. The Select Detect system uses an accelerometer to measure three different motions.

SCR HR-TAG™/ Semex AI24™

The HR-TAG recently launched in October, is a neck mounted accelerometer, along with a microphone that “listens” and times the cow’s rumination activity. The rumination microphone is a relatively new technology and can be used to detect illness. Current research at the University of Kentucky is examining the relationship between rumination time and estrus.
GEA Westfalia Dairy Plan C21™

GEA farm technologies recently released the Rescounter II+. This new product monitors and records individual cow activity every two hours. It is available in leg or neck versions. The program works with the Dairy Plan software through GEA, but can be operated alone.

IceRobotics™

The IceQube sensor by IceRobotics measures steps and lying time for individual cows. It summarizes data into 15 minute blocks, with lying bouts by the second. Data can be stored for 3 days or up to 60 days. Lying time could be useful to detect illness, while the increase in steps and reduction in lying time can be used to detect high activity cows.

DeLaval™

The DeLaval activity monitoring system is a part of the DeLaval AlPro herd management software. The system records activity on an individual cow basis, every hour, 24 hours a day. This activity monitor is mounted on a collar. The Herd Navigator™ management system includes the heat detection system. The system, which is being used in Europe now but is not available in the US yet, has the capabilities to measure progesterone levels in line for increased pregnancy detection. The program also has measures for mastitis detection and ketone levels.

Animart™

The Animart Legend™ system records activity on an individual cow basis up to ten times per hour. The data is then sent to the Animart Legend Track a Cow Software. The tag is mounted on the cow’s leg.

Boumatic™

The Boumatic heat detection system is a neck activity monitor. It transmits data as the cow moves through the parlor. The data is then sent to the Boumatic herd management software installed on the farm. High activity lists are then created from the downloaded data.

There are several other systems available across the world that may make it to the US. The systems mentioned above are some of the common systems that may be available in the US.

Considerations

There are the obvious reasons why producers would switch to automated estrus detection systems: less labor, no required visual heat detection, etc. However, there are problems synchronization protocols would address that automated systems would not. Cystic cows are one of the bigger concerns with automated estrus detection systems. With a synch protocol such as G6G or double-ovsynch, cystic and anovular cows will be taken care of. With the activity monitoring system, cystic and anovular cows, will still need to be treated. Hopefully producers would be set up to detect and manage these problems, but they could go unnoticed. Should your farm decide to install an automated estrus detection system, patience will be key. It will take employees and workers on the farm to become acclimated with the system and learn the system and how to use it effectively. A good rule of thumb is to give yourself six months to become familiar and know how to use the system to its full extent. These systems weren’t designed to raise your pregnancy rates overnight.
Costs

Cost is another factor that comes into play when determining your reproduction management program. The start-up costs for an automated estrus detection system can get expensive, but over the long-run, you will be purchasing and injecting significantly fewer hormones. Researchers have yet to do a cost-benefit analysis on these systems, but they look promising. Getting cows bred as soon as possible after your voluntary waiting period is key. The cost of one extra day open can range anywhere from $2.00-$4.00. Days open has yet to be compared between automated estrus systems and synch protocols, but by using automated systems you are catching almost all heats, thus minimizing days open. This brings the question of fixed versus variable costs in evaluating farm size. In many cases, most of the costs are variable which means there aren’t many advantages for larger farms—these systems can work well for small farms and may even work better because smaller farms have less time to dedicate to heat detection and injection administration.

Current Research

Research at the University of Kentucky using the AfiMilk™ system is ongoing. The goal of this research is to compare conception and pregnancy rates between the AfiAct System and an ovulation synchronization protocol. This one-year trial is being conducted in three Kentucky dairy herds.

Another trial at the University of Kentucky Research Farm using the SCR™ activity collars will begin soon. The new HR-TAGs, which also measure rumination activity, will be used to determine if there is a relationship between rumination and estrus. The collars are equipped with an accelerometer, and a microphone, which records rumination time and activity. The IceRobotics IceQubes™ and DVM Systems temperature boluses will also be examined in this study.

Conclusions

It is important to consider the benefits and setbacks of each system. If you are using a synchronization protocol and achieving conception rates of 40%, there may not be a good reason to switch. If labor and time management are an issue on your farm, then an automated estrus detection system may be right for your farm. If your farm milks twice a day, then a system that uploads data more frequently rather than at every milking may be the better route. If your farm is milking three times a day, then a system that uploads activity data as the cow passes through the parlor would work. Many considerations need to be considered when choosing a system that is right for your dairy, and many considerations should be taken into consideration whether or not automated estrus detection is right for your farm.

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