

Five New Developments in Precision Dairy

COOPERATIVE
EXTENSION
SERVICE



By: Matthew Borchers, Karmella Dolecheck and Jeffrey Bewley, Ph.D.

The 7th European Conference on Precision Livestock Farming was held September 15 to 18, 2015 in Milan, Italy. The conference provided an opportunity to not only share research results, but also discuss future applications for animal monitoring. Five of the dairy topics discussed at this year's Precision Livestock Farming Conference were:

- Combining robotic milking and grazing: The concept of incorporating an automated milking system (AMS) into a grazing herd is complicated by the requirement that cows must voluntarily come from the field to the robot. Researchers at Moorepark, an animal and grassland research and innovation center in Ireland, are studying how changing AMS milking frequency can impact milk production, cow traffic, and milking duration. Preliminary results show that reducing the number of visits the cow is allowed to the AMS could improve cow flow and make AMS use easier for grazing herds.
- Economics of combining robotic milking and grazing: Moorepark researchers also considered the economic implications of using an AMS system in a grazing herd. They found AMS systems implemented in grazing herds to be profitable, but with lower net profits than conventional milking herds. Therefore, if a producer using a grazing system is interested in investing in an AMS system for social or other reasons beyond net profits, the option should still be considered.
- Virtual fencing: For grazing herds, investment in fencing and the labor associated with moving fencing can represent a significant cost. Researchers in Ireland have come up with one potential solution to this problem: virtual fencing. In this system, each cow is fitted with a collar. Collars receive a signal indicating the assigned grazing area. If cattle approach the boundary of a grazing area, collars beep to communicate this. If cows cross this boundary, a small shock is issued to encourage the cow to turn around. Preliminary studies of this technology confirm that most cows can easily adapt to this system, but further development will be needed before it becomes commercially available.
- Real-time milk separation: Cheese production is maximized when milk coagulation properties are ideal. Coagulation properties vary drastically between cows and even from the beginning to the end of milking for each cow. Afimilk has developed a system that can monitor coagulation properties and the type of fat produced while cows are being milked. When this system is used in conjunction with multiple bulk tanks, milk can be separated for use as cheese, fluid milk, or any other use. This system would be valuable for producers with access to multiple processors, milk pickup routes, and component premiums. Although already being implemented on some Israeli farms, adoption elsewhere will depend on the market and milk pricing systems. This system also offers the benefit of monitoring fat mobilization rate and type in early lactation cattle. Using this system, cows that are at risk for ketosis or other metabolic disorders can be identified and treated more quickly.

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.

Five New Developments in Precision Dairy

- Real-time cow location: Several presentations at this conference focused on the development and improvement of real-time cow location systems. Utilizing the ability to find and identify dairy cattle in large housing facilities is an interesting concept, but is difficult to financially justify. Because of this, manufacturers have added additional metrics in order to increase the usefulness of these technologies. These systems now offer heat detection, health monitoring, lameness detection, calving detection, and many other uses. The combination of behavior monitoring and knowing where cows spend their time enhances these system's monitoring capabilities compared to other commercially marketed technologies. This could provide information that is much more useful to managers than traditional accelerometer-based systems.

Precision dairy management can be an answer for many issues on a dairy farm, but further development is necessary for many of the technologies and concepts mentioned above. Through collaboration between manufacturers, researchers, and most importantly dairy farmers, steps can be taken to improve the effectiveness of dairy cow management.