Use of RFID Ear Tags in Dairy Herd Management in Canada

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As part of the national livestock identification (NLID) program to identify all bovine animals, Canadian dairy animals, since 2004, have used uniquely coded half duplex radio frequency identification (RFID) ear tags compliant to ISO 11784 and 11785 standard.   While designed to be a traceability tool, the tags provide a practical and inexpensive option for automated on-farm identification and for use in herd management systems. Field experience in applications involving automatic calf feeding, parlour identification and sorting systems are described. Because of lower cost and the regulatory requirement to use these tags, they have completely replaced commercial RFID neck tags in calf feeders.   This technology is rapidly being applied in management of larger dairy herds of 1000 cows and up in United States, however there is a need to develop applications for freestall herds in the 100 to 500 cow range for this technology to gain widespread acceptance as a herd management option in Canada.

Two approaches were used to learn about application of RFID technology in Canadian dairy farms: 1) A pilot project involving two dairy farms with differing management systems, one using a management rail and one using self-locking headgates to gain knowledge in the use of RFID technology, wand readers, handheld computers and related herd management software. 2) Follow-up surveys conducted by CanWest DHI staff of their client dairy farmers who had recently purchased RFID herd management hardware and software.

1. In the Pilot Project, the two subject herds had been using computerized herd management software but all operations in the barn were carried out with paper and clipboard. Each herd was provided with: Approved RFID tags to identify all cows in the herd, handheld RFID readers, handheld computer devices, and associated hardware and software including wireless communication. Before and after measurements of time and labour used for cow management activities were recorded by a technician and evaluated. In one herd, time saved by the herdsman and veterinarian for creating work lists, applying multiple treatments following a single sort, describing and recording treatment events, reduction in time resulted in a one year payback.

In the other herd, insufficient headlocks and inability to adapt to new technology and new work routines meant that the technology provided variable results and no overall benefit. Tag issues, adaptability of the herdsman's routine, and overcrowding were found to be factors in success or failure of application of this technology. In addition to labour saving and improved work efficiency, other potential benefits include fewer treatment errors and better protocol compliance, ability to collect more detailed management information, and improved cow welfare when the need for restraint for handling is minimized. Challenges such as tag retention, the need for interim tag replacement, tag positioning, reader design as well as wireless technology and use of audio commands were dealt with in the study and possible solutions and limitations determined.

2. Client follow-up study survey questions were designed to collect information to characterize the herd, management characteristics, ease of use and success with adoption of the RFID reading equipment combined with the handheld computer, wireless communications and herd management software, and labour saving and efficiencies gained from its use. Six dairy farmers who had purchased and applied this technology within the past 1-2 years were interviewed with a standard set of questions. All participants used a PSION brand weatherproof protected handheld datalogger type computer with an attached Agrident extendable reader wand and equipped with wired communication to earphones for audio commands to the operator. These herds used Dairy Comp 305 herd management software along with Pocket Cowcard handheld software to implement the RFID scan setups. Data transfer was by a docking station.

Average herd size was 432 milking cows with a range of 250 to 730 cows. Four out of the six herds had undergone expansion in the previous year up to 58% in one herd. All but one managed cows in groups, and handling facilities varied including locking headgates, sort gates and management rail, or a combination of both depending upon groups within the same herd. The number of people using the handheld and scanner in a herd was from one person to three.

Uses of the RFID System

All participants used the RFID scanner and software for regular veterinary checks, three used it with their heifers for checking ID, moving between pens, and vaccinations. One herd used it for ovsynch and two herds with AI breeding. Other uses including treatment records, hoof trimming, looking-up cow information in the barn, checking information on cows in heat. Training required was not identified as an obstacle in any of the farms. Time required for training varied widely from 1-4 hours to two days total time spread over 1-2 months. Time required increased as more people were involved and in one situation there was a language issue.

All participants stated that time transcribing or entering data was reduced. Most participants identified reduced time spent checking for cows and time required to handle and treat cows. Those who tracked time saved reported savings of 30 to 60 minutes per veterinary check, and 15 to 30 minutes less time entering data. Cows spent 30 to 45 minutes less time in headlocks per procedure. The number of people required to do the herd management tasks was unchanged.

Summary

The initial study of adoption of RFID computerized technology in dairy herd management in a pilot project of two dairy herds identified issues of consistent 100% compliance in tagging, adaptability of herdsman to technology, and facilities such as overcrowding in handling area. Positive returns on investment resulted from reduced operator time to ID cows, sorting and treating, especially uploading and downloading information and as well, accuracy of ID and protocols. The survey of users of the RFID DairyComp305 system identified time savings in handling and treating cows, in working with veterinarian in vet checks, and in data uploads and downloads as well as better accuracy in cow identification and data recording and transfer. After initial set up and training, users were generally satisfied that the system generally improved efficiency of management of their 200 -700 cow herds. A response by one user was: "Now that I have it, I would not be willing to give it up".