Using PocketDairy with RFID for herd management

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Summary

Herd management software for use on mobile devices continues to grow in popularity and in the number of features. The addition of RFID as the identification driver significantly reduces the labor involved in data collection, and increases accuracy of the on-farm database.

***Key words**: Mobile devices, Handheld computers, Dairy herd improvement, RFID, PDA.*

Introduction

Since the early 1970s, one of the most popular reports provided by Dairy Records Processing Centers has been the pocket-sized herd management report. The obvious disadvantage was that the data were only refreshed following the monthly Dairy Herd Improvement (DHI) test. The freshness of data took a step forward with the advent on on-farm management software, but as herds grew in size, even these locally-printed pocket reports became unwieldy. Harnessing the first widely successful mobile platform (Palm), PocketDairy was released in 2000 as the first comprehensive program for dairy management data input and access. The mobile device is synchronized with a desktop herd management system (PCDART) to extend the farm database to cowside and field locations. With the release of ISO-compliant radio-frequency identification (RFID), all lookup and input functions in PocketDairy were enabled for this form of identification.

RFID environment in the USA

Numerous attempts to require RFID in animal agriculture at the federal level have not been successful. At the current time, numerous states have implemented phased regulatory approaches to RFID adoption, but the DHI organizations cannot rely on mandatory RFID adoption on which to build an RFID services market. This has forced RFID solution providers to develop strategies based on sound economic return at the farm level. Milking systems manufacturers have recently been investing

in solutions based on passive RFID, but adoption is only at the earliest stages. However, farms employing this solution provide an excellent opportunity for early adoption of RFID-based mobile devices.

General benefits of mobile devices

Virtually all management action data are available in PocketDairy for all cows, heifers and bulls at all times. This reduces the delay in performing ad hoc cow management tasks that rely on the availability of current data.

"One-time" data entry

The most apparent benefit of mobile data entry is the elimination of the labor needed to transfer data from the pocket notepad or clipboard to the desktop system. However, the greater impact on farm operations is likely due to the savings generated by the reduction in errors. Anecdotal reports indicate that numerous errors are trapped at the mobile entry point due to real-time error checking in the mobile device and the presence of the cow handler at the time of data entry to correct the flagged entries.

Real-time data entry

On most large farms, manual data recording is performed by the field staff, and input into the onfarm system is accomplished by an office staff working in batch entry mode. Therefore, recent inputs are not available to other cow handlers until hours or days following input. Using PocketDairy, mobile input data can be synced numerous times per day, making up-to-date information available to all handlers.

The managers at two early PocketDairy installations (using five to eleven devices) have reported a significant change in the daily decision-making process. Rather than rely on office staff to input the previous day's events, all cow handlers sync their devices throughout the day. At the end of the day, the farm management staff reviews reports based on the day's activities, and is prepared to adjust the tasks scheduled for the next shift of workers. This eliminates one-half to a full day from the decision-action loop.

Consultant data entry

Informal use of PocketDairy by consultants, veterinarians, and genetic industry field staff has been reported throughout the PocketDairy market. This usage reduces data entry and data transfer delays.

Primary management uses for PocketDairy

Numerous forms of identification are stored in PocketDairy, but a very significant linkage is made between the RFID number and the index number. This linkage can be made on the desktop, but is usually accomplished in the barn upon the first encounter with the new animal. The linkage screen is accessed during a dedicated registration task or whenever an animal is encountered that does not have a registered RFID tag. Once the linkage is made, the user is not exposed to the RFID number again.

Cow page lookup

The most frequently accessed screen is the Cow Page, providing basic status and production data. Additional user-defined fields are available for download of custom items.

Data input

The types of data entered using the mobile device are targeted to cowside entry activities, but are generally similar to data entered at the desktop computer, such as calving, breeding, pregnancy, treatments, disposal, and new animal entry. Even without RFID, data entry is surprisingly efficient due to the use of droplists preloaded with frequently used selections.

RFID enhancements

Using RFID, various PocketDairy functions are enhanced significantly, including:

- ***Cow Page with Audio Playback –*** Users can link an audio file to cow records that satisfy a particular query. The user then rapidly walks through the barn while scanning cows in a hands-free mode until a cow of interest triggers the audio file. In this manner, cows of interest can be quickly located for treatment, group changes, etc.
- ***Lost Animal Feature –*** In large dairy operations, cows are frequently placed in an incorrect group. By wanding and comparing against the correct group number in the mobile database, the "lost cow feature" alerts the user to the presence of cows in the incorrect group.
- ***Treatments, Chores and Protocols –*** PCDART provides a system for active management of tasks scheduled for individual cows or groups of cows. Various settings are available in PocketDairy to permit scripted data input and to allow data to be applied to an entire group of cows.

Interfacing with PCDART

Numerous mobile devices (up to 99) can by synced with PCDART by direct connection or wirelessly. During the sync, mobile inputs are edited for accuracy and applied to the PCDART database and processed. All updated records are returned to the mobile device within the same sync session.

The farm manager can set administrative options to restrict users to various read/write options and subsets of the entire farm database. One commonly requested feature at large farms using multiple devices is the ability to review the quality of the input received from the mobile devices.

Supported operating systems

The evolution of the PocketDairy system began solely on the Palm operating system. During the period from 2000-2003, the Windows CE and successive operating systems were extremely unstable. Once the Windows OS stabilized in 2004, PocketDairy was ported to that platform. However, the significant installed base of Palm users were resistant to the higher cost and complexity of the Windows OS. In addition, the upgrades of the Windows Mobile OS are often more intrusive and more complex than Palm OS upgrades. In 2008, PocketDairy continues to be available on both platforms, with no plans to deprecate either platform.

The changing mobile devices market

Market conditions in the mobile device hardware market can significantly influence the success of the mobile systems deployment. As various vendors enter and leave the market, the mobile customer base alternates between enthusiasm (over new product releases) and apprehension (over the obsolescence of recently-purchased hardware).

The release of new Palm devices is slowing significantly as Palm, Inc. focuses exclusively on smartphones. The sales of consumer-level Windows devices are also fairly stagnant following the departure of Dell from the mobile device market. Fortunately, devices for vertical field management applications, such as produced by Socket, are filling the void. Pricing is attractive for use by DHIA field management and on large dairy farms, but may be too high for widespread adoption by moderate-sized herds. The only mobile platforms experiencing growth at this time are Blackberry and Apple, in form factors that appear inappropriate for on-farm use.