Experiences with comprehensive herd management of a mega-dairy using RFID, automatic milk recording and multi-client cow-side data entry with reproduction and health protocols

D.W. Webb

Southeast DHIA, Inc. and University of Florida, P.O. Box 142460, Gainesville, FL 32614, USA

Abstract

A comprehensive data base system, integrated with DHIA and automatic milk recording has been used for total management of a herd with 7600 female animals located in Florida. Cow identity is provided by Allflex RFID tags. The herd’s primary data resides in PCDART along with real-time milk weights and parlour performance collected by Boumatic. The milking parlour is a double-40, rapid exit system with dual sort-gates at each of two exits. Computer work stations, networked to PCDART are present at three cow-side locations for entry and look up of breeding, health and group data. The adult cow herd of 3800 milking is milked three times per day. Cows are sorted for diagnosis, treatment and breeding on each of two milkings, 7 days per week. The herd uses extensive estrus synchronization, embryo transfer and aggressive sire selection programs. PCDART’s protocol system allows for generation of to-do lists and signals for cows to be sorted for attention.

Keywords: DHIA, RFID, sort gate, data management system.

1.0 Introduction

Large herds in the U.S. have implemented varying strategies to accomplish day-to-day management routines. Some herds have unique barn configurations, designed to manage cow location in order to have similar cows housed together. Others use lock-up stanchions for breeding, vet check and treatment.

The herd in this study depends on cow-sorting after milking to allow breeders and other personnel access to cows needing various kinds of attention. Cows are managed in groups ranging from 100 to 500 cows. Each cow passes a dual sort gate as she exits the double-40 milking parlour. Cows may be sorted automatically based on algorithms in the parlour software or by the PCDART program’s schedule of chores to be done that day. Additionally, farm personnel can enter sort requests based on observation or knowledge of a particular cow’s history or need. Networked PC’s, located at cowside allow for immediate access to and input of breeding and health information. PCDART, QUICKCOW and BOUMETRIX software programs are used for individual cow information in the parlour office. A second parlour, double-12 is used for cows in the hospital area.

Located in the agricultural community of Bell, Florida, 30 miles west of Gainesville and the University of Florida, North Florida Holsteins is home to 6400 head of Holsteins on 1250 acres. Managing partner Don Bennink and the entire management team are committed to producing quality milk from comfortable cows. Priorities for this herd are breeding, performance, herd health and environmental stewardship. Management depends heavily on digital information for everyday operation.

North Florida Holsteins practices an intensive embryo transfer program with a professional veterinarian performing the flush while in-house herd health technicians implant the embryos. This procedure is used both for genetic improvement, and to maximize conception rates during the extreme summer heat. Approximately 20% of the herd is bred to young sires, including homebred sires from well-respected cow families.
More than 70 employees are organized into seven departments, including: parlour, herd health, calf, hospital, heifers and feed, farm maintenance-crops, and administration. Among these employees at any given time one will find 8-10 international students, most of whom have veterinary or four year agriculture degrees, participating in a highly successful program where both the students and the farm benefit.

2.0 Description of Data Management System

The observations of this study began with the transition from a previous system in June of 2009. The new system consists of two BM2060 controllers from Boumatic, each connected to an individual PC on the parlour office network. There are a total of 13 PCs, 2 for Boumatic, 3 at cow-side stations, 6 in the office, 1 as server for PCDART and 1 for data backup.

Cows are identified with RFID. Current tags are all Allflex HD button tags. Numbering is coordinated with Holstein USA for registration and pedigrees.

Cow identification, milk weight assignment and automation control are managed by software from BouMatic, called the SmartEID™ISO Ear Tag ID System, specifically SmartEID™ and BouMetrix. These programs interface with PCDART (pcdnet version) for acquisition of data entered by the farm staff and delivery of milk weights and other data collected at milking. BouMetrix receives cow-sort requests from PCDART and generates parlor sorts based on real-time observation at milking. Both are transmitted to the sort gate controllers such that cows can be sorted for action as they exit the parlor.

PCDART serves as the primary database combining data from Boumatic, cow-side, office entries, DHIA, USDA AIPL genetic evaluations, USA Holstein pedigrees and physical traits. Health and status events are stored for lifetime. Individual milk weights are maintained for 400 days. PCDART provides a system of protocols and chores to assist in organization of actions needed for all cows on a daily basis. Once cows are entered into a protocol, they will be included in the work list and cow-sort requests for the appropriate day according to the schedule for that protocol.

Quickcow is a PCDART dependent application that is used to view individual cow’s most current data at cow-side. It can be configured to display user-selected data in an abbreviated format to make use more convenient. Quickcow consolidates the most recent parlor data including milk weight, deviation and parlor sorts.

3.0 Experience and observations

Parlour data for all milking cows have been collected successfully for both the double-40 and double-12 parlors. PCDART communicates routinely with both BM2060 controllers and successfully collates data from both. Early in the observation period, data were transferred at the close of each milking. Currently, parlour data are being pulled at 10-minute intervals. Data entered at cow-side are transmitted immediately.

Sort gates are operating fully and provide cows for breeding, treatments, vaccinations and reproductive evaluations for all cows. Sort gates run during first and second shift (0700-2300 hr) every day.

In the first weeks of observation, there were significant issues with EID tags not being read. These problems were found to be due to significant electrical noise emitted by motors, lights and other devices. Once these were cleared, identity has been satisfactory with 94-96% complete on most days.

Herd management personnel have defined 77 different protocols using 146 chores for routine herd management. (Protocols = schedules. Chores = actions, drugs or observations scheduled.) These protocols have been used heavily. For example, for 8 months...
(September - April) 2355 cows were enrolled on the primary synchronizing protocol (SYP); 1807 cows were on the foot management protocol (LAMECHK); and 3087 animals were on the primary vaccination protocol.

On the most recent herd test 3774 milking cows averaged: 35.3 kg milk, 3.7% fat, 2.8% protein, 178 thousand SCC.