# 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

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## Abstract

A comprehensive data base syste m, integrated with DH IA and automatic milk recording has been used for total ma nagement of a herd wi th 7600 fem ale 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 d ual sort-g ates at each of two exits. C omputer wo rk 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 da ys per week. The herd uses extensive estrus synchronization, embryo transfer and aggressive sire selection programs. PCDART's protocol system allows for generati on of to-do lists and signa ls for cows to be sorted for attention.

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

## 1.0 Introduction

Large h erds in t he U.S. have implemen ted v arying strategies t o accompli sh day- to-day management routines. Some herds have uni que barn configurations, designed to manage cow location in order t o h ave sim ilar cows h oused together. Others use lock-up s tanchions f or breeding, vet check and treatment.

The h erd in t his stu dy depen ds on cow -sorting af ter milking t o al low breeders an d oth er personnel access to co ws needing various kinds of atte ntion. Cows are managed in groups ranging from 100 to 500 cows. Each cow pa sses a dual sort gate as she e xits the do uble-40 milking parlour. Cows may be sorted automatically based on algorithms in the parlour software or by the PCDART pr ogram's schedule of chores to be done tha t day. Addi tionally, farm personnel can enter so rt requests based on observation or k nowledge of a part icular co w'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 t he agricu ltural comm unity of Bell, F lorida, 3 0 mi les w est of Gain esville an d t he University of Florida, North Fl orida Holsteins is home to 6 400 head of Holsteins on 1250 acre s. Managing partner Don Bennink and the entire management team are committed to prod ucing quality mi lk f rom comf ortable cow s. P riorities for thi s he rd are breedi ng, performance, her d health and environmental stewardship. Management depends heavily on digital in formation for everyday operation.

North F lorida Holst eins pract ices an in tensive embryo transfer program with a professiona l veterinarian performing the flush while in-house herd heal th technicians implant the embryos. This procedure is used both for genetic improvement, and to maximize conception rates during the extrem e summer heat. Appro ximately 20 % of the herd is bred to young sires, including homebred sires from well-respected cow families.

More than 70 employees are or ganized into se ven de partments, including: parlour, herd health, cal f, hospi tal, hei fers and feed, farm maintenance-crops, a nd administration Among these employees at a ny given time one will fi nd 8-10 internati onal studen ts, most of wh om have veteri nary or fou r year agriculture degrees, part icipating in a h ighly su ccessful program where both the students and the farm benefit.

## 2.0 Description of Data Management System

The observ ations of th is study be gan wi th th e transi tion from a previ ous syst em i n June of 2009. The new system consists of two BM20 60 controllers from Boumatic, each connected to an individual PC o n the parlou r office network. There are a to tal of 13 PC's, 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 A llflex 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 h ave been co llected successfu lly for both the d ouble-40 and double-12 parlors. PCDART com municates routinely with both B M2060 controllers and successfully collates data from both. Early in the observati on 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 bre eding, treatments, va ccinations and reproductive evaluations for all cows. Sort gates run d uring first and second shift (0700 -23 00 hr) every day.

In the first weeks of o bservation, there were si gnificant issues wi th EID tags no t being read. These problems w ere fou nd t o be due t o significant elect rical n oise e mitted by motors, ligh ts and other devices. Once these were cl eared, i dentity has been satisfactory with 94- 96% complete on most days.

Herd management personnel have defined 77 different protocol s using 146 cho res for routine herd mana gement. ( Protocols = sc hedules. Chores = actions, drugs or observations scheduled.) These protocols have been us ed heavi ly. For exampl e, for 8 months

(September - April) 2355 cow s were en rolled on  the primary  sy nchronizing  protocol ( SYP); 1807 cows were on the foot mana gement protocol (LAMECHK); and  3087 animals were on the primary vaccination protocol.

On the mo st recent  herd test 37 74 milk ing co ws avera ged: 35.3  kg milk, 3.7% fa t, 2 .8% protein, 178 thousand scc.