Production, Management, and Environment III

320   Development of an integrated dairy farm decision support system to facilitate dairy management–I. Data integration and warehousing. S. R. Wangen*[1], H. D. Rodriguez[2], D. Liang[2], A. Christensen[1], M. Ferris[1], and V. E. Cabrera[2], [1]*The Wisconsin Institution for Discovery, University of Wisconsin-Madison, Madison, WI,* [2]*Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.*

The Virtual Dairy Farm Brain project proposes innovative ways of transforming the way farmers collect, use, and apply data on their farms. In this session, we describe Part 1 of the project: Data integration and warehousing. Disparate data streams describe many of the activities that take place on a large dairy farm (i.e., feeding, milking, management decisions, genetic testing, DHI test, milk composition, and economics). Independently these data streams are informative, but through integration it is possible to build a much richer picture of farm operations. The project aims to utilize the data richness to develop a decision support system (DSS) that can provide insights to the farm in near real-time to help dairy farmers optimize decisions. Records are extracted from farm management, feed monitoring and milking parlor software and are transferred from the farm to centralized server on a daily basis. Genetic, milk composition, and DHI test data, collected from the third-party services, are transferred on a monthly basis. All of these data are subjected to a normalizing and cleaning processes to create a flexible data warehouse structure that can be used to develop farm-level performance dashboards, perform fundamental research by aggregating farms to create large data sets for predictive model development, and provide enhanced analytic tools for the farm by applying those research models to farm-specific data. A proof of concept web interface will also be shown that illustrates the ability of the system to aggregate multiple sources of information to investigate the impacts of health events on daily milk production and feed efficiency at the herd and cow-level. In the future we hope to integrate a suite of analytical tools that will allow users to navigate, visualize, and analyze their own farm data across multiple sources in a single interface. In addition to data visualization and descriptive analysis, the DSS will allow farmers to investigate the tradeoffs of different management scenarios to help find optimal farm management strategies.

Key Words: data integration, decision support systems, farm management