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Dairy Production Medicine in Canada

Paul Baillargeon* DMV, MSc, St-Louis de Gonzagues,QC, Émile Bouchard DMV, MVPM, St-Hyacinthe,QC, Stephen LeBlanc DVM, DVSc, Guelph,ON

The evolution of veterinary services in animal production has been described previously[5]. The recognized simple host-agent relationship of the epidemic diseases has moved toward a more complex environment-host-agent relationship[2]. Brand *et al*, in the editor's preface of their textbook suggest the terminology "Herd Health and Production Management" for this new way of delivering veterinary services to the dairy producers. The veterinarian becomes a herd management advisor in this new framework with the objective of optimizing animal health and production[2].

In this approach, the traditional role of the veterinarian is still recognized but clinical diagnosis and accompanying treatment, instead of being an endpoint, become the starting point of an investigation process aimed at the identification of the risk factors involved in the observed problem. The evolution of the philosophy underpinning dairy production medicine practice in North America has been described[3,4,6]

The Canadian dairy industry

In January 2002, veterinary practitioners were providing services to 18,673 dairy farms in Canada, of which the majority were located in Quebec (48%) and Ontario (33%). The average number of milking cows per herd in the country was 57 (45 for Quebec), 86% of herds (93% for Quebec) were less than 78 cows and average milk 305-day production per cow was 9242 kg[i].

Industrialization of milk production has resulted in higher production per cow and larger number of cows per unit of operation thus increasing the need for management support at the farm level. These changes have brought fundamental changes to the demands on veterinarians, and the stakes involved. To serve larger, more sophisticated dairy farms, veterinarians must understand and advise on increasingly complex interactions among pathogens, nutrition, facilities, environment, cattle management practices, and human resource management. The knowledge and skills to successfully provide such a service were not part of traditional veterinary curricula.

The veterinary profession adapts to the changing industry

At the end of the eighties, there was an intense search for tools that would support the new role of the veterinarian on the farm. Two significant projects were developed and offered to veterinary practitioners across the country: the ASTLQ (Amélioration de la Santé des

Troupeaux Laitiers du Québec) research project and the Dairy Health Management Certificate Program in Guelph.

The ASTLQ research project in Quebec, in 1990, was intended to create new tools to help the practicing veterinarian to assist producers to improve the profitability of their business. Specifically, the plan was to build a comprehensive animal health database for dairy cattle, to develop software (DSA - *Dossier Santé Animal*; Animal Health File)and to educate and train veterinary participants in all aspects of Herd Health and Production management[1].

In 1993, at completion, the projects linked 1400 herds and 35 clinics with the Data Bank of the Population Medicine department of the *Faculté de Médecine Vétérinaire* (FMV) in St-Hyacinthe. The products of the ASTLQ research project have since been offered to veterinary practitioners of the province. In 2004, the service has a network of about 200 veterinarians in 50 clinics and 1900 dairy herds across the province. Overall, 2982 herds have been filed since in the data bank[ii].

The Dairy Health Management Certificate Program (DHMCP)

The concept of the DHMCP was pioneered at the University of Guelph in 1990 as means for dairy practitioners to gain advanced knowledge in dairy production medicine in a short time frame that was consistent with the demands of practice. The mission of the DHMCP is to provide intensive, science-based education to enable progressive dairy veterinarians to gain knowledge, skills, and attitudes to enhance the health, profitability, and sustainability of dairy farms. The objectives are that graduates of the program have knowledge of current information on dairy cattle health and performance, evaluate health management strategies in a financial context, apply medicine, epidemiology and economics to identify and solve herd problems, and be seen as thoughtful and ethical leaders in the dairy industry and veterinary profession.

The program consists of a group of the same 35 practitioners and is delivered over two years in twelve, three-day modules of lectures, seminars, case studies, and farm visits covering topics such as monitoring and analysis of records, nutrition, infectious disease control, reproduction, design of facilities, udder health, economics, and financial analysis. The program is distinguished by extensive small group discussions between experts and the group, and among the practitioners, as well as assignments in which participants apply new information and skills in their clients' herds. The first group graduated in 1992, and the second in 1994. Since then, an annual 2 to 3 day update meeting is held to maintain knowledge, contacts, and motivation among the participants. The program was successful and has since been emulated at several universities in the United States. Graduates report that their professional confidence, enthusiasm, and satisfaction, and to a lesser extent financial success, were greatly enhanced by the program. A new and updated offering of the program began with a third group of 36 veterinarians in October 2002.

Health Data Management

Some of the challenges veterinary practitioners must deal with in implementing Herd Health and Production management programs are handling of data, developing the skills for data analysis and mastering the tools to do so. Most dairy operations use some sort of manual herd record including some health data. Sharing information with the veterinary practitioner is often

technically difficult or tedious and he often must reorganize the existing system in order to access the necessary data.

Computerized health records have done a lot to facilitate both the capture of information and the analysis of data. Two of these systems are currently used on a large scale in Canada. DSA for dairy is used by about 200 dairy practitioners in Quebec through DS@HR[iii] in a packaged service including access to the software, training and continuing education sessions, and a biannual comparative herd report. A Canadian version of Dairy Comp 305 (Valley Ag Software, Tulare, California) is used in the other provinces. The system is managed the CanWest DHI and made available to both dairy practitioners and producers in different versions.

DSA for Dairy

This computer program was built using the individual animal record as a starting point. This record allows each animal in the herd an unlimited number of entries using an alphabetical coding system. Production data are integrated from Dairy Herd Improvement (DHI) (PATLQ[iv], ODHIC[v]) monthly electronic reports and can also be summarized and sorted in different ways either in pre-programmed or in user defined reports. Data entries are performed by technical staff or by the practitioner before the farm visit thus allowing for validation and for synchronization of the filed information with the veterinary visit.

DSA has been developed to support veterinary activities at the farm. A growing number of practitioners are taking portable computers with them into the barn in order to capture the full benefit of the program capabilities in this respect. Accessing up to date information of each individual cow at a key stroke has done a lot for veterinarians looking for a proactive strategy in their farm visits. The objective is that, by the end of the farm visit, no cow should escape any planned assessment or management procedure.

Record analysis is an important aspect of this program. The veterinarian can access, among others, detailed analysis of udder health, production and reproduction performance. An innovative alarm system performs analysis of 19 management areas and allows the veterinarian to quickly pinpoint issues of concern. Prediction of daily herd production and analysis of test day milk components are modules that have proved to be powerful instruments in the hands of the veterinarian wishing to advise herd management on these matters.

The service provided by DsaHR includes semi-annual summary reports on the data bank accessible on its internet site, and biannual comparative herd reports in which every herd is ranked on four different management areas, expressed in terms of associated milk losses.

Dairy Comp 305

In Ontario and western Canada, different software programs and data collection systems are employed. Key assumptions of the system were that data entry by veterinarians is likely inefficient and unprofitable for the practitioner, and that the existing data collection and processing system of milk recording (CanWest Dairy Herd Improvement (DHI)) could be used and built upon. In 1996, Ontario DHI evaluated various existing commercial dairy data management programs, and Dairy COMP 305 (DC) was selected. The advantages of this

software were that it offers very extensive capability for customized analysis and reports, can be used on farm for daily management tasks as well as interface with parlour data, and is widely used in much of the USA. All farms on DHI in Ontario and western Canada have a DC file that contains at least an inventory of all animals with parity, calving and dry dates, monthly milk production and components, and in most cases somatic cell counts. Additionally, if provided by the herd owner, all breeding data, disease events, and management events (e.g., vaccination, hoof trimming) can be entered and integrated with other data. After each visit to the farm by DHI staff (generally 10 times per year), updated animal data as well as production and SCC data are integrated and are available for download by veterinarians within 2-3 days. Veterinarians also have the ability to transfer data directly from the approximately 5% of herds that use the DC software on the farm. The system is used by field veterinary practitioners in support of their herd health visits [7]. The flow data from collection to processing and back to producers and veterinarians and other advisors has been dubbed "The Loop" (Figure 1).

In Ontario, 73% of the approximately 5500 dairy herds are on DHI, and in 39% of these (28% of all herds) the herd veterinarian accesses the herd information via the Loop monthly. In the four western provinces, 62% of the approximately 2300 dairy herds are on DHI, and in 19% of these (12% of all herds) the herd veterinarian accesses the herd information via the Loop monthly.

This system has the advantages of providing the task of most data entry for veterinarians, and having practitioners use a common software tool for herd monitoring so that approaches and tips can be shared among users. Weaknesses of the system are that reproduction and disease records may be incomplete if producers are not motivated to provide these data, and health events do not yet have standard case definitions across farms. The potential to benchmark herds using a provincial or national database has not yet been developed to its potential.

Conclusion

Pioneering work of the early nineties in St-Hyacinthe and Guelph has had a tremendous impact on repositioning Canadian veterinary practitioners to meet the new challenges facing the dairy industry. Development of new tools and acquisition of new skills through continuing education have filtered in their already busy agendas. Herd health and production monitoring is now a large portion of their mandate and it is likely one of the best tools available to the industry to successfully manage its profitability as well as the growing consumer concern about food quality, animal welfare and safe use of antibiotics.

Abstract

Les médecins vétérinaires en industrie laitière du Canada se sont adaptés aux changements survenus en industrie laitière au cours des dernières années. Le projets ASTLQ au Québec et le « Dairy Health Management Certificate Program » pour les autres provinces constituent des étapes importantes de cette évolution. Ce texte présente les grandes lignes de ce qu'il est maintenant convenu d'appeler la Médecine de Production en industrie laitière pour le Canada.

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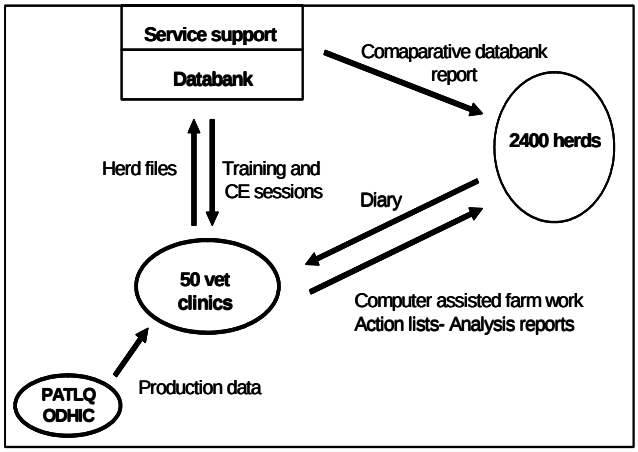

Figure 1. DSA for Dairy Data Flow Network

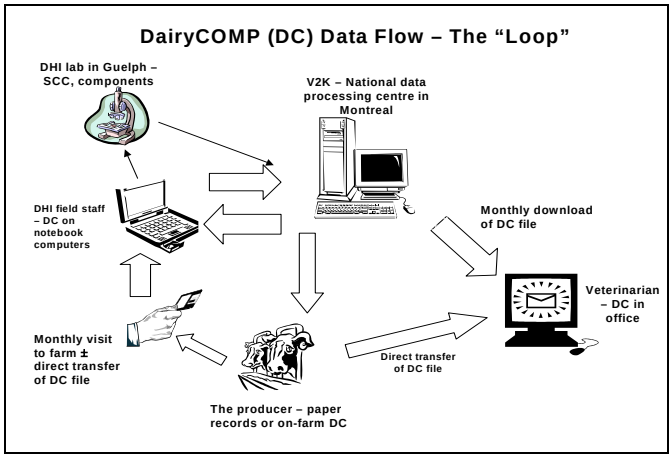

Figure 2. DaryCOMP Data Flow Network

[i] Dairy Farmers of Canada, Facts and Figures 2000-2001
[ii] David Cambell, DS@HR, communication personnelle
[iii] DA@HR Inc., 2645 Sicotte, St-Hyacinthe, Qc, J2S 2L3
[iv] PATLQ Inc., Ste-Anne de Bellevue, QC
[v] ODHIC, 660 Speed Vale Ave , Suite 101, Guelph, N1K 1E5