Minnesota's Transition Management Facility: A Private–Public Partnership in Dairy Veterinary Education and Applied Research

John Fetrow ■ Trevor Ames ■ Ralph Farnsworth ■ Sandra Godden ■ Paul Rapnicki ■ Steven Stewart ■ John Vrieze

INTRODUCTION

Colleges of veterinary medicine face several challenges relating to educating veterinary students in dairy veterinary medicine. Changes in the nature of the dairy industry, in the veterinary student population, and in teaching hospital case loads have all placed unique pressures on colleges to adjust their clinical training programs and to prepare students for a different style of dairy practice.

Dairy (and, similarly, beef cattle) practice is unique in the veterinary profession in that it must address issues of individual animal clinical care while also operating on a population-based, economically driven level as well. Individual cows are valuable enough to warrant ante-mortem clinical diagnosis and therapy, but consolidation of the industry into larger production units means that many common illnesses are diagnosed and treated by lay personnel, and veterinary services often operate at a consulting and production medicine level.

Colleges of veterinary medicine have historically relied on their teaching hospital case loads to provide the clinical material for veterinary education. For dairy education, this method is increasingly untenable for most, if not all, colleges. Large production units are likely to deal with most or all clinical problems on-farm, referring few, if any, cases to a teaching hospital. Private practitioners are fully capable of dealing with the overwhelming majority of surgical cases needing care, and the cost and inconvenience of transport and bio-security issues make many producers hesitant to send animals to teaching hospitals, most of which are now in urban areas. Costs of care in most teaching hospitals have grown in response to internal financial demands, and often care is priced at a point that makes it economically unfeasible for routine cases to be referred. On the other hand, operating food animal clinics at a loss places financial strains on colleges under budget pressures. Despite efforts to subsidize food animal cases or provide transportation, at many teaching hospitals the few cases that do arrive are either very valuable animals with unusual complaints or cows en route to the necropsy floor as representative cases of a larger herd problem. Ambulatory clinics provide teaching opportunities at some colleges, but at many schools geographic constraints and the nature of the local dairy industry may make this option ineffective.

The end result of these forces is that few cases of routine dairy cattle disease ever arrive at a teaching hospital. Case loads are conspicuously lacking in common diseases such as metritis, mastitis, ketosis, dystocia, milk fever, or even abomasal displacement. Students may graduate without any experience in diagnosing or treating these disorders, despite the fact that after graduation such problems will be the bulk of their clinical practice and they will be expected to train lay staff on dairies how to identify and treat them. In addition, it is interesting to note that the individual diagnostic process and uniquely tailored treatment regimes that are the cornerstone of internal medicine and surgical case management in a teaching hospital are to some extent at odds with standardized case definitions and treatment protocols that graduates will need to put in place for lay staff on large dairies.

To further complicate the problem, students entering dairy practice need practical experience at a level beyond the clinical care of individual sick cows. Because most veterinary students have not grown up on a dairy farm, they also need to learn what normal cows look like (e.g., normal variation in conformation, behavior, normal events at calving). In order to function effectively in a consolidated dairy industry, students must be comfortably familiar with the workings of large dairies, including day-to-day operations (feeding, routine cow flows, standard operating procedures, labor utilization, manure handling, etc.) as well as understanding how veterinary and medical services and protocols integrate into the operation. None of this can be taught in a teaching hospital. Learning about how a modern dairy farm works requires on-site experience in large dairy operations.

In order to educate veterinary students interested in dairy medicine, colleges adopt a variety of strategies: purchasing cases, laboratory sessions, externship opportunities, field trips, rotations at other institutions, ambulatory practice experiences, and so on. This article describes another approach to addressing these issues: a private–public partnership designed to provide an active clinical case load for education in the context of a large commercial dairy enterprise.

A PRIVATE–PUBLIC PARTNERSHIP IN VETERINARY EDUCATION: THE NATURE OF THE AFFILIATION

In 2000/2001, the College of Veterinary Medicine at the University of Minnesota (CVM-UM) formed a private–public affiliation with a large dairy enterprise near Baldwin, WI, about one hour's drive east of the college. The private dairy operates two 1,200-cow dairies about eight miles apart. Under the affiliation, a special 400-cow facility was built (adjacent to one of the two dairies) to house and care for cows during the dry period, at calving, and for the first few weeks after calving (the "transition period"). The facility is called the Transition Management Facility (TMF). The TMF calves approximately 2,500 cows per year. In addition to the dairy, the site has teaching classrooms, simple laboratory

space, additional restraint facilities, and housing for up to eight students.

Much is made of the value of private–public partnerships in education, but less is said about the challenge of actually finding a partner with whom those partnerships can flourish over an extended period. The CVM-UM has been extremely fortunate to have developed such a relationship with our partners in the dairy enterprise. Our partners met the practical criteria of being properly geographically situated and of sufficient scale to support the project; more importantly, they have the broad vision, entrepreneurial spirit, and willingness to take the risk of entering into a long-term agreement with an academic institution, with all its foibles of structure, operating styles, and non-commercial missions. Faculty in the college worked with the partner dairies for several years on a variety of projects before the TMF was initiated, helping to build a relationship and an understanding of what each side could bring to the table. A good understanding of the separate goals of each party is as necessary as the sharing of common goals. Each partner must see personal advantage to the partnership and respect and protect the interests of the other partner.

The CVM-UM's interests in the affiliation are the following:

- Access to sufficient clinical material to train dairy veterinary students in clinical medicine (for both routine clinical disease and better understanding of the normal events in early postpartum cows) and dairy herd management
- An education and demonstration site for veterinary continuing education and courses for dairy management professionals (owners, managers, technical service personnel, nutritionists, consultants, extension educators, etc.)
- A training and research project site for graduate students and advanced clinical training
- A development and test site for dairy management innovations and information systems
- An applied research facility for dairy health and management

The private dairy partners' interests in the affiliation are the following:

- A genuine interest in advancing dairy production practices, information, and promoting the dairy industry
- A desire to stay at the leading edge of technology and optimum cow management and care
- A desire to interact with university faculty on a routine basis to enhance their dairies' management and profitability
- Opportunities to collaborate and profit from joint programs in education and research at the facility
- An infusion of capital during construction to add aspects to the facilities that might not otherwise have been possible

Ownership of the facilities remains in the hands of the private owner. During construction, the university provided additional capital to build facilities needed for the academic mission that would not be built in a commercial facility, including student housing, teaching and laboratory space, enhanced clinical care facilities, information technology infrastructure, and information systems. In return, the college was granted exclusive rights to all educational programs and research in the facility and the two parent dairies for seven years, renewable with the agreement of both parties.

The private partner retains final authority over all aspects of management at the TMF (labor, finances, feeding, etc.) but has delegated day-to-day management and operations to the college and the facility manager. The one exception is drug use: the college retains final authority on all drugs and treatment protocols used within the TMF. The manager was hired jointly by both parties, and his salary is split equally between the two. Apart from a small contribution from the college for extra utilities, cleaning, and supplies, operating costs are borne entirely by the parent dairies.

Decisions at the TMF are generally made by consensus, first between the college's faculty and the TMF manager and, if needed, with additional input from the dairies' partners. Because feed is delivered out of the same central feeding facility for one of the parent dairies, very close (nearly daily) interaction is required between faculty, the TMF manager, and the feeding manager for the milking dairy. Managers of the two dairies are at the TMF at least weekly and are kept aware of status and any problems. It is crucial for the affiliation's long-term success that the college work to assure their private partners' success as a first priority. As in private veterinary practice, if the "client" fails, the veterinary involvement will fail as well.

If the partner dairies choose to withdraw from the relationship at some point, they must give adequate notice to the college to allow adjustment of the teaching program. The agreement also prohibits the dairies from entering into a similar agreement with another institution for two years after severing the partnership with the CVM-UM. The affiliation agreement requires repayment of an amortized portion of the college's capital input if the relationship is terminated prematurely.

Development of the TMF and its early start-up operation required immense effort planning and execution from the college's dairy faculty. Before and during construction, at least the equivalent of one person working full-time on-site was committed to considering design characteristics and assuring that what was envisioned was actually constructed. This included significant travel to facilities elsewhere to investigate the feasibility of many of the design considerations. On an ongoing basis, the equivalent of approximately two full-time people are now committed from a mixture of faculty to oversee management issues, balance rations and monitor feeding, develop research projects and continuing education offerings, and provide DVM educational programs.

TMF OPERATION

The TMF receives cows from the parent dairies at dry-off. Cows are processed, dry treated, and moved to the free stalls to complete gestation. Approximately 200 cows and heifers calve each month, with all of the expected events common to the transition period. Cows typically remain at the TMF for two weeks after calving, until they have stabilized in their lactation and are free of clinical illness and any

withdrawal periods for drugs are completed. The TMF milks about 70 cows per day through a modern, single 12 parallel parlor with full automation. Limited laboratory facilities are available for mastitis cultures and antibiotic testing, and work is under way to add basic clinical pathology equipment. Records on all cows, including clinical events and daily milk production, are kept on the computer system in DairyCOMP,[a] and milk production is recorded automatically at each milking. Students have access to these records at all times.

Calves remain at the TMF for less than 24 hours. They are processed at birth according to standard protocols, fed colostrum, and held in an area separate from the cows. They are picked up each morning and taken to an off-site heifer rearing operation. The college maintains relationships with that operation as well to allow follow-up research into calf health and performance.

The TMF is sufficiently staffed by dairy employees that all necessary functions can be done without university or student involvement. Thus the TMF does not depend on students or faculty for day-to-day operations. A local dairy veterinary practice provides surgical and (rarely needed) emergency services to the facility when there are no students or faculty on-site. That practice also maintains the formal veterinary/client/patient relationship with the dairy and issues prescriptions for all drugs shipped to the dairy. Again, good coordination and communication are essential to making these relationships work.

EDUCATIONAL PROGRAMS

DVM Clinical Education

The TMF was created with a particular focus on providing a productive site for clinical training of senior veterinary students interested in dairy practice. Students may elect one or more two-week rotations at the TMF as part of their senior curriculum. Students in the rotation reside at the TMF and are thus available for clinical training opportunities at all times. Students typically spend the early to mid-morning working with a faculty member, resident, or herdsman screening postpartum cows for problems and treating sick cows. Cows are examined in self-locking catches at the feed bunk. If further in-depth evaluation is needed, or if a case has particular merit for teaching, the cow is brought up to a special clinical area for further diagnostics. Surgeries are also done in this area. Almost all surgeries done are for correction of left displaced abomasum. After nearly 6,000 calvings, only a handful of cesarean sections have been necessary.

Following the morning screening and follow-up treatments, students slot into whatever major animal management activities are happening: assisting with calvings if needed (always a priority), processing newborn calves and just fresh cows, vaccinations, processing and dry treating incoming dry cows, trimming feet or treating lame cows, walking pens to find calving cows, and so on. A deliberate effort is made to involve students in the day-to-day tasks necessary to operate the TMF. This work helps students understand normal operations and develop an understanding of and respect for work and workers in the operation, which will serve them well later in their practice careers. They will be credible and will also understand the implications of the advice they give about what others should do.

In addition to these operational experiences, students are also encouraged to make use of other learning opportunities in the TMF. They are expected to milk at least two full shifts in the parlor and are encouraged to ride with the feeder through one cycle of evaluating the feed bunk and mixing and delivering feed. Some students will work with the local veterinary practice when they do reproduction checks on the adjoining large dairy; some spend a morning with the foot trimmer at the large dairy; and so on.

It is common for structured activities at the TMF to quiet down by mid-afternoon. Sometimes this time is used for discussion between instructors and students. In addition, a developing series of independent learning modules on a variety of topics is available for students to use. These modules are designed to be narrowly focused enough that a student can complete them in a few hours. They have defined learning objectives and typically involve some selected reading materials; they may include watching a videotape, visiting a Web site, or referring to a CD. In most cases, they also include specific "hands-on" tasks for the student to complete in the TMF itself (e.g., shaking feeds for particle size, firing the captive bolt device under supervision, setting up Delvo-P antibiotic tests). As time goes by, the goal is to build an extensive library of these learning modules for the students so that they can independently pursue topics of interest under practical conditions.

Currently, rotations at the TMF are offered about 10 times per year, for a total of 20 weeks. Rotations are filled first with the college's own students and then by arrangement with other collaborating colleges, which recommend students demonstrating a commitment to enter dairy practice. The most constraining resource is faculty/instructor time available for operating teaching rotations. Rotations work best when four students or, preferably, fewer are present. With more than four, Socratic interaction becomes difficult and people begin to get in each other's way.

Other DVM Education

The TMF also serves as a site for teaching/field trips for students in earlier years of the DVM curriculum. In addition, there is a program in place that allows students in earlier years of the curriculum to volunteer on weekends to spend a day helping at the TMF, thus adding to their experience in dairy and becoming familiar with large free-stall operations.

Summer Research

Summers are a busy time at the TMF in terms of research projects. DVM students are hired as research assistants and learn by doing. This has been a fruitful aspect of the program and has helped encourage interest in dairy veterinary careers.

Continuing Education

The TMF has become an active site for continuing education. The classroom size limits groups to about 20; the emphasis is on interactive seminars with practical application. Many programs have been hosted for veterinarians, nutritionists, industry technical service personnel, and dairy producers. In addition, a new program has just been established in which a management trainee (non-veterinarian) can come to live at the TMF and "shadow" the manager and herdsman, learning how to operate a transition program and provide better care for cows at this vulnerable stage.

This program operates in those weeks when there is no senior DVM clinical rotation.

Public Education

The TMF has also played a very active and visible role in public education about the dairy industry. On average, two to three tours per week pass though the facility: business clubs, schoolchildren, producers, government personnel, dairy professionals, and so on. At a conservative estimate, several thousand people have had the opportunity to stand in the classroom that looks out over the facility and watch as calves are born, cows are fed, and care is given to animals in the unit.

Web Education

There is a Web page devoted to the TMF as part of the CVM-UM's Center for Dairy Health, Management and Food Quality, accessible at the college's Web site: http://www.cvm.umn.edu. From the college home page, navigate to Departments and Centers, then to the Center for Dairy Health, Management, and Food Quality, and then to the TMF site. The site is still under development, but it offers the visitor a virtual tour of the facility and access to protocols used, rations fed, and so on. This window to the TMF extends its educational impact far beyond the limits of regional geography and enhances its impact as a demonstration site for dairy management best practices.

Research Programs

The TMF also serves the college as a laboratory for applied research in the health and management of the transition dairy cow. While the facility is constrained to some degree by its commercial priorities, many aspects of the life of the transition cow and neonate can be investigated under practical operating conditions.

CLOSING SUMMARY

The Transition Management Facility of the College of Veterinary Medicine at the University of Minnesota is a unique experiment in clinical dairy education. The private–public partnership provides benefits to both parties, making this model possible under conditions of constrained public resources for veterinary education. Another advantage of this model of clinical education is that it provides a valuable alternative to the use of purchased animals in laboratory settings.

The commercial partners gain value from access to capital in early phases of construction and start-up operations (covering the costs of constructing academic mission facilities), from the quality and intensity of veterinary services and consulting, from some additional manpower (particularly for sick animal care during teaching rotations), and from faculty expertise. In return, the dairies provide a unique, practical, and intensive education and applied research opportunity for the college and incur all the business risk and liability.

Over the long term, such relationships must be based on mutual advantage. In this case, the private partners receive some service and management enhancement and some financial input in terms of the manager's salary and participation in program income. In exchange, the college has access to a state-of-the-art dairy facility for teaching and other academic opportunities without long-term operating and capital renewal costs. The cost per student year to the college, viewed over the long term, is small. The risk assumed by the college is also small, particularly compared to the traditional additional administrative burden of trying to operate a university dairy facility. If production technology changes radically and the facility becomes obsolete, the college will not be left with "bricks and mortar" to support with diminishing value to the academic mission.

This approach satisfies many of the educational needs of the college in the new dairy industry. The private–public partnership model provides one more strategy for addressing the educational challenges of dairy veterinary education.

NOTE

a Valley Agricultural Software, Tulare, CA 93274 USA <http://www.vas.com/>.

AUTHOR INFORMATION

John Fetrow, VMD, MBA, is Professor of Dairy Production Medicine, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

Trevor Ames, DVM, MS, is Chair of the Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

Ralph Farnsworth, DVM, MS, is a member of the Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

Sandra Godden, DVM, DVSc, is a member of the Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

Paul Rapnicki, DVM, MBA, is a member of the Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

Steven Stewart, DVM, is a member of the Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108 USA.

John Vrieze is the principal partner at Baldwin/Emerald Dairy, 2487 County Road G, Emerald, WI 54013 USA.

Address correspondence to Dr. John Fetrow, Professor of Dairy Production Medicine, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 1365 Gortner Ave, St. Paul, MN 55108. E-mail: fetr0001@umn.edu.