Commentary

Implementing a future national center concept in veterinary education for the dairy industry

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More than a quarter of a century ago, concerns were raised about the nation’s capacity to address animal health issues in the 21st century. Later, a Pew report provided suggestions for new directions for veterinary medicine, including veterinary practice in the 21st century. That report contained numerous far-reaching suggestions and admonishments. At least two that are germane to this commentary are, first, that the profession needs to focus resources on the development of species specialists, abandoning the idea of equality of competency in all domestic species, and second, with respect to food supply veterinarians, the profession needs to broaden the educational foundation to include focus on the animal population and associated management as it relates to health. The author of that report identified the need to provide the educational capacity to enable practicing veterinarians to contend with livestock enterprises of various sizes. Following the Pew report, the Pew Foundation, through the Pew National Veterinary Education Program, funded a competitive proposal process, from which several food supply educational consortia that have been considered effective were selected. One of these was the Food Animal Production Medicine Consortium (FAPMC).

The FAPMC, composed of six cooperating universities, focused on species-specific food animal programs, including beef cattle, dairy cattle, and swine programs. The FAPMC offered various educational and research programs, including student exchanges. The organization lasted about 11 years until 2000; however, student exchanges continued between some of the original participating universities. The dissolution of the FAPMC has been attributed to changes in leadership, loss of adequate funding, and failure to market its services effectively. Because of the nature of academic consortia, they are considered to be high risk in terms of longevity. With regard to the FAPMC, the dissolution was probably hastened by legitimate changing self interests of some of the member institutions and, following termination of the Pew funding, the inability of the consortium to develop adequate long-range funding strategies to sustain core programs. Baus’ points out that the primary motivator for interinstitutional cooperation is enlightened self-interest. Also, it is essential that an academic consortium have a sustaining financial basis to accomplish intended missions.

More recently, the profession has focused on concerns about future markets for veterinary services, especially those associated with food supply veterinary medicine. One comprehensive report projected, through 2015, a negative (−1.7%) demand for veterinarians going into large animal private practice. In response to this report, another, which used a different forecasting model, predicted a mean overall forecast for demand of 1% per year but a mean overall forecast for shortage of approximately 4% per year. It is disconcerting, but perhaps not surprising, that two comprehensive reports dealing with different demand models for professional personnel to support essential national needs—food animal health and food security—reached diametrically opposed conclusions.

Overall, we would believe that, at present, the profession simply does not possess the necessary metrics to adequately determine food animal veterinarian supply and demand. Prince et al offered suggestions to address potential future shortages. A number of those centered on the selection and nurturing of veterinary students toward careers in food animal medicine. They also offered that the challenge of consolidation in the food supply system must be pursued as an opportunity requiring professional adaptation.

Contemporary professional concerns have not been limited to just the supply and demand for food animal veterinary medical services. There is the anticipation that veterinarians must be involved in food safety and security and as guardians against bioterrorism. Buss et al pointed out that a contemporary food animal veterinary education should also include the topics of public health, infectious disease, food safety and security, food system management, water-borne diseases, diagnostic medicine, environmental quality, and ecosystem health. Given these subject areas, veterinarians should be better prepared than any other professionals to take the lead in food safety for all foods. And the veterinary profession in the United States is increasingly concerned about the vulnerability of the nation’s livestock population to bioterrorism. In the event of an episode of livestock bioterrorism or a foreign animal disease, first responders would be livestock producers, families of producers, and veterinarians. However, in a survey of veterinarians in one state, only 20 of 123 (16%) reported they were prepared to respond effectively to a bioterrorist attack, although 90% said they were willing to assist the state in response to such an attack.

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In 2005 and 2006, the Association of American Veterinary Medical Colleges (AAVMC) in conjunction with the Norm Willis Group Inc developed and implemented a plan to conduct a long-range planning study for academic veterinary medicine using a process called Foresight Analysis, a tool that estimates forward 20 to 25 years. As with the Pew report, the Foresight Project report addressed fundamental issues confronting the veterinary profession and offered challenging recommendations for addressing these issues. Included was the recommendation that veterinary colleges establish curricula offering selected areas of professional focus most appropriate to their capabilities. Certain areas may be identified by institutions as a center of emphasis. A national plan would ensure that all such defined areas of focus would be available on the continent in at least one center of emphasis. Effects would also be centralized in appropriate centers of emphasis to create leading critical masses of expertise. Certain centers of emphasis may require participation by more than one academic institution. Such programs would require inter-institutional agreements on residency, tuition, and fees.

The concept of centers of emphasis to fulfill a specialized need in food animal veterinary education is not new. Nearly 20 years ago, a veterinary center of emphasis focusing on clinical educational opportunities for students interested in working with cattle was proposed and described in detail. What seems to us unique about the recommendation from the Foresight Project is an emphasis on a strategic goal to generate a critical mass of expertise. This implies that the center concept should be expanded beyond reinforcement of clinical education for fourth-year veterinary students; that is, instruction should extend to residents and graduate students as well. Hence, a center would become more comprehensive in its overall missions. As pointed out in the Foresight Project report, such a center approach would require far-reaching collaboration.

We propose such a comprehensive center for a specific sector of our livestock industries—the dairy sector. Among our contentions is that without regard for numbers of students entering food animal medicine (which we agree is a fundamental issue), those who do enter must be well-educated in basic sciences and in species-specific disciplines to contend with the changing structural, economic, social, and environmental demands of a particular industry—in this case, the dairy industry. The center we envision would have teaching, research, and outreach missions. Conceptually, a national veterinary dairy center (NVDC) would not supplant or replace most of the core curricula of veterinary schools or colleges. Rather, we envision that the NVDC would substantially augment those curricula. A foundation goal of the NVDC would be to provide in-depth clinical education to a variety of students (professional, graduate clinical, graduate academic, and practicing veterinarian, including those in industry). This clinical education would, for the most part, be within the production environment, and it would involve cooperation with private veterinarians and, at times, veterinarians associated with relevant segments of public practice. These personnel would hold adjunct clinical appointments in the center and receive remuneration for their efforts. The clinical programs of the NVDC would not be organized along specialty discipline lines. Rather, the clinical programs at the center would be organized around clinician delivery teams viewed as species specific and industry specific. Additionally, as we will point out in more detail, the NVDC must be located within major populations of dairy cattle to optimize educational and research imperatives. As Marshak has noted with regard to American colleges of veterinary medicine, “A school’s geographic location, regional demographic trends, changing agriculture, and other factors determine the size and quality of clinical case material for teaching and research. In this respect, schools differ greatly.” A goal of the NVDC would be to negate those variables to provide a consistent education in dairy medicine.

**US Dairy Cattle and Farms**

In 2006, there were approximately 9.1 million cows on 61,900 licensed dairy farms in the United States with a mean herd size of 147 cows collectively producing approximately 182 billion lb of milk with a typical production of approximately 20,000 lb/cow. In 1997, there were 123,700 farms, down from 227,880 in 1987—21 years ago. However, during this period, mean milk production increased more than 6,000 lb or approximately 30%, and total production increased 21.5%. Despite an overall decline in total farms, operations with ≥ 200 cows increased and by 2001 accounted for nearly 60% of US milk production. Associated with the trend in production efficiency there are others: dairy farms are becoming concentrated in certain regions of the United States, and they are specialized for the production of milk. These regions are the Northeast (New York, Pennsylvania, and Vermont), Midwest (Minnesota, Wisconsin, Michigan, Iowa, and Ohio), and West (California) and other West (Washington, Oregon, New Mexico, and Arizona). The top 10 dairy producing states (California, Wisconsin, New York, Pennsylvania, Idaho, Minnesota, New Mexico, Texas, Michigan, and Ohio) produce about 78% of the nation’s milk and contain about 71% of the national herd. All but Texas are clustered in an identified region, and 10 states within those regions contain a school or college of veterinary medicine. Indeed, eight of the top 10 milk-producing states contain colleges or schools of veterinary medicine. For the most part, American dairy industry is regionalized, and farms are larger, more sophisticated, and logically more complex, as far as production and ecologic and animal health issues are concerned. However, few American veterinary colleges are sited to provide relatively close (approx 25 miles) proximity to major farm and cattle populations. This demographic, as has been pointed out by Marshak, impacts the size and quality of clinical case material for teaching and research. It is unlikely that the demographic patterns we now have in the dairy industry will appreciably change in the foreseeable future. If the profession is to keep its hand and mind in dairy cattle medicine and adopt the strategies for veterinary education outlined in the Foresight Project report and others, schools will need to
move instructional and research resources to the dairy cattle populations. In this regard, and taking into account needs for national food and economic security and environmental health, we offer thoughts on the development of National Veterinary Dairy Centers of Emphasis (NVDCEs).

**NVDCEs**

To maintain a cadre of dairy veterinarians, enhance national biosecurity within the dairy industry, and promote food safety and environmental health, we propose the establishment of three NVDCEs that are federally funded but housed within a university structure. This arrangement could come about through long-term grants or contracts between agencies of the federal government and respective universities, initially secured through a competitive request for proposal process. Federal funds for construction and some ongoing programs could pass through the US Department of Homeland Security (DHS) and Agriculture (USDA). Key federal agencies such as the DHS, the USDA Food Safety and Inspection Service, the USDA Animal and Plant Health Inspection Service, and the US Department of Health and Human Services would maintain programs at each center. These programs would be used to facilitate specialized instruction for a variety of students—professional, graduate clinical, and graduate academic.

**Center objectives**—The objectives of the center would include the following:

- To provide a regionally centered national resource for the in-depth education in dairy production medicine and management for a variety of students (professional students and graduate clinical, graduate academic, and practicing veterinarians).
- To provide a resource for the instruction of graduate clinical and graduate academic veterinarians to maintain a cadre of veterinarians in dairy medicine and production and management.
- To provide a base of instruction and research facilitating education in the development of consultant capabilities, especially in the areas of animal welfare and well-being, biosecurity, food safety, and ecosystem health for the dairy industry.
- To provide scientific and production environments for investigation of dairy cattle inefficiencies, including the multifactorial nature of production disease, using epidemiologic methods.
- To optimize faculty resources.
- To serve in conjunction with state and federal agencies as regional sentinel resources for the early detection of new and emerging diseases, including those not currently in the United States.
- To provide and enhance instruction (including outreach) and research capacity in areas that impact the health and welfare of the industry including biosecurity, animal welfare, food safety, and environmental challenges and controls.
- To provide an environment to integrate relevant instructional and research programs in dairy cattle production and management with colleagues in cooperating colleges of agriculture.

**General considerations**—Each center would be built within close proximity to major dairy cattle populations and have an integral diagnostic laboratory associated with and, ideally, close to milk processing and market dairy cow processing facilities. The juxtaposition to processing facilities would aid in the instruction of food hygiene and would allow investigation of food safety concerns from farm through product processing.

Each center would be administered by the veterinary school or college awarded the grant and would be led by a director reporting directly to the dean. A regional advisory board composed of private sector members (dairy producers, private veterinarians, and public members) and representatives of state and federal agencies (USDA and DHS) would facilitate operation of each center. The dean of the college and the director of the center would serve as ex-officio members, and the center would conduct operational activities bylaw processes established as part of the request for proposal.

The general organization of a bovine center of emphasis has been described. This description can be readily modified to accommodate more contemporary needs and issues, including implementing programs for rapid exchange of information and virtual regional education using contemporary technology. The center can be used as a regional base of operations for various outreach programs dealing with bioterrorism, food security, animal welfare, and environment health.

**Student involvement**—Veterinary students desiring to enter dairy practice or other aspects of the dairy industry would spend either a part of or their entire fourth year at a center, depending on the curriculum at their home institution. Some noncenter schools, both in and outside a region, may decide that the clinical phase of their dairy educational program will be discontinued. These schools would contract with a center to provide clinical rotations. It is recognized that some schools or colleges may need to modify fourth-year curricula to accommodate scheduling. Schools that continue dairy clinical programs could decide whether it is in the best educational interest of their students to also attend the center. In all circumstances, students would receive an evaluation and grade from center faculty but would graduate from their home institution.

Professional students would come to the center with health insurance but would receive other benefits and privileges accorded to students at the university that houses the center. Students enrolling at a center would pay tuition at their home university. The center would charge nonresident students (for a rotation or an academic year) its university’s out-of-state tuition level for veterinary medicine. This charge would transfer from the student’s university to the university containing the center. Any difference for noncenter university students between resident tuition and the nonresident tuition and fees would be borne by funds supplied through the federal grant.

Students who are academic clinical (residents) veterinarians will receive a stipend that is considered competitive with a salary that would be obtained during the first year of practice. The duration of a residency program should be approximately two years. Graduate stu-
dent stipends would constitute parts of grant requests from faculty at the center to federal, state, foundation, and industrial granting agencies.

Each center would contain a series of dormitory-style rooms with kitchens and small furnished apartments for married students with families. The cost of the housing would be the responsibility of the student; however, the federal grant should contain funds for housing loans at a nominal interest rate. The principal and interest from the loans as well as tuition differential would be recycled back to the center. If a center was located a substantial distance from a parent campus, it should contain modest recreational facilities such as a volleyball and basketball court and a fitness room. The living accommodations would provide housing needs for professional students and a cohort of residents.

Summary Recommendations and Conclusion

- The AAVMC needs to serve as a facilitator for planning centers of emphasis, including regional NVDCEs, to address the rapidly changing needs of the dairy industry and, consequently, the profession.
- Any regional NVDCE planning committee should include interested faculty, industry leaders, and regulatory agency representatives including USDA and DHS representatives.
- Federal agencies and dairy industry representatives as well as politicians need to understand that funding for the centers is a national responsibility to help ensure safe, high-quality food products and environmentally friendly production units.
- Federally funded competitive grants are required for NVDCEs to provide the needs of our animal product food systems.

We are aware that this proposal could be difficult to implement, especially from a funding perspective; however, if the AAVMC and the AVMA, in association with other members of the Food Supply Veterinary Medical Coalition along with commodity organizations and the DHS, took steps to initially debate the advisability of implementing the concept and, if in accord, later worked with federal legislators to authorize, fund, and enable the concept, the veterinary profession will have taken a very positive first step to “assure the public that food continues to be abundant, safe and wholesome by ensuring that veterinarians are appropriately involved throughout the food supply system.”

References