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Food Animal Veterinarians: Where We Came From and Where We Might Go

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In the United States, veterinary medicine essentially began in the 18th and 19th centuries. Those who considered themselves to be animal doctors had little if any formal training and were at times known as cow leeches, farriers, or gelders.[1] Treatments varied from the empirical to the destructive. In 1857, the first school of Veterinary Medicine—the New York College of Veterinary Surgeons—was established by Dr. Alexandre Liautard in New York City. Yet by 1900 less than 10% of those claiming to be veterinarians actually received any formal training.[2] The effect on the profession's early reputation was imperfect and predictable.

By the early 20th century, the practice of veterinary medicine was primarily concerned with those animals involved in food and fiber production, transportation, and labor (draft animals). The majority of veterinary texts were devoted to these "working" species and significantly less interest, effort and curricula was directed toward companion animals. A 1916 editorial in the journal *Veterinary Medicine* related to the study of canine pathology suggested that students lacked all interest and did not even consider canine practice as being worthwhile.[3] In effect, during this era both students and their mentors were less than enthusiastic supporters of companion animals as part of the veterinary curriculum.

As the century progressed, it was not long before the advance of mechanized technology and access to the internal combustion engine resulted in a perception that the value and utility of draft animals was waning. To many practitioners the threat of a decreasing need for their expertise and services and the subsequent bleak economic outlook, lead to a large exodus from the profession. Fortunately, the value of horses and cattle eventually rebounded in conjunction with an increased market for beef and other livestock products. In a remarkable turnaround, the growth of animal agriculture helped secure a future for veterinary care.

By the 1930's, the global economic status and uncertain political climate resulted in a significant decrease in veterinary college enrollment.[4] Difficult times in rural environments resulted in the migration of many veterinarians to cities in order to survive.[5] Animal hospitals emerged in order to meet the needs of companion animals located in these urban settings. In parallel with the shift

of veterinarians to the more densely populated areas, significant strides were also occurring in the fields of modern medicine, including veterinary medicine. Research efforts resulted in the development of vaccines for animal diseases such as brucellosis, rabies and distempter. Antibiotics such as sulfas and penicillin became available. The veterinary profession once again found itself well on the way to becoming a well-respected and dignified occupation, which, in addition to providing care for companion species, also became involved in preventative medicine and even human health concerns.

As World War II ended and the economic situation improved, modern medical science continued to expand. Veterinarians became established in lucrative urban settings caring for companion animals while others returned to rural farming communities. Scientific discovery enhanced the knowledge and techniques available to human and animal medicine, providing veterinarians with the tools necessary to provide high quality care for all animals.

By the mid 20th century, the influx of medical information and technology aided the advancement of both large and small animal medicine. Species specialization, followed soon by discipline specialization, became more common in order to keep up with the growing amount of information. Multiple doctor practices evolved to provide greater quality and quantity of care. Rural veterinarians either specialized in a particular livestock species or remained as mixed practitioners caring for a wide variety of species. In conjunction with the development of veterinary specialties, owners and producers came to expect high quality, state-of-the-art care.

Modern bovine practice essentially began in the 1950's in parallel with the increased national consumer demand for readily available wholesome meat and milk. Food animal practitioners could provide high-quality, individual animal care. Typical problems addressed by food animal practitioners included pneumonia, diarrhea, mastitis, metritis, obstetrics, metabolic conditions such as milk fever, and others. From the 1950's through the remainder of the 20th century, great strides were made in understanding and preventing common bovine diseases. For example, testing and vaccination strategies reduced the number of brucellosis infected cattle herds in the US from 124,000 in 1957 to essentially zero in 2004.[6] Significant progress was made in the fields of bovine reproduction, nutrition, medicine, surgery, infectious disease control and vaccinology. Clinical capabilities were greatly improved with the development of advanced diagnostic testing and modalities such as ultrasound.

Through the latter half of the 20th century significant changes occurred in animal agriculture. Increased efficiency allowed larger animal numbers per production unit, yet resulted in smaller profit margins per animal unit. As a result, the number of small, traditional family farms declined as they became less able to compete with the development of the larger, more efficient agribusinesses. Concurrent with the shift in farm demographics, food animal veterinary practices began to move away from focusing on individual animals and more toward herd health and population medicine. From the 1970's onward, the principals of herd health, disease investigation, and disease prevention were adopted in conjunction with modern bovine epidemiology. Software programs were developed for tracking production data related to the dairy, beef and swine industries. The concept of 'production medicine' which incorporated overall herd health, disease prevention, and optimized production was seen as a necessary component of food animal veterinary medicine and veterinary education.

Today, marked changes in food animal agriculture and veterinary medicine continue. As society continues to urbanize, the number of farms and ranches declines while their size increases and animal production continues to intensify. Mixed animal practitioners typically remain in rural settings where raising food animals is not a sole source of owner income. Main stream beef and dairy industries utilize the services of food animal specialists who act as herd health and production medicine consultants. As less and less of society possess experience with animal agriculture, it continues to benefit from the efficiencies of industries that provide low cost, wholesome, and safe meat and milk products. The contributions of veterinary medicine in general, and food animal veterinarians in particular, need to be recognized in this success story.

Paradoxically, the availability of inexpensive, wholesome animal-origin products in combination with ready access to alternative food products, has empowered consumers (most of whom lack knowledge of animal agriculture) with the ability to influence animal production. Concurrently, health concerns regarding consumption of animal products, and environmental concerns related to animal production, has cultivated a skeptical view of animal agriculture. Animal agriculture must now walk a fine line in order to provide consumers with low cost, quality products in a manner consistent with societal expectations. Clearly, the role of veterinarians, as vanguards of animal health, well-being, and a safe food supply must now keep pace with the concerns and expectations of animal producers and consumers.

Not surprisingly, changes in veterinary education have paralleled the demographic, social, and economic changes in society. The majority of veterinary students now come from urban backgrounds and few possess sufficient knowledge and experience with agricultural animals. Student interest is now primarily focused on companion animal practice and there is a decline in student interest regarding food animal practice. Some surveys suggest less than 15% of students now desire a career in food animal practice.[7] At the same time, veterinary education costs have risen significantly leaving new graduates with large educational debts. Lacking familiarity with agricultural animal practice, a majority of new graduates now enter urban, companion animal practices with a perception of greater economic opportunity and more predictable work schedules. Interestingly, recent data from the Bureau of Labor Statistics suggests that starting annual salaries for veterinarians in large animal exclusive practices are only $2320 less than veterinarians in small animal exclusive practices.[8] No clear data exists regarding the predictability of work schedules in any sector of veterinary practice as this may be dictated more by seniority and management structure.

The current shift of veterinary graduates toward companion animal practices and away from agricultural based practices has had a direct influence on veterinary school curricula. Many veterinary colleges provide curricula centered on a generalist program with differing electives or "tracks" directed at a particular species or discipline. As the core of many veterinary programs is currently focused on companion animals, many risk failing to adequately prepare new graduates who are competent in bovine practice. One might predict that a 'generalist' veterinary education available today is likely to provide graduates with only the minimum needs of modern cattle producers. Students desiring to enter large animal practice may need more refined tracking programs that can prepare new veterinarians with meeting the broader needs of the animal agriculture industry.

A predicted shortage of food animal veterinarians in practice, industry, government, education and research has been the subject of many recent news articles, academic reports, and legislative proposals. Significant interest has been shown regarding the potential lack of appropriately trained professionals who can address the needs and expectations of society as it relates to local, national and international animal agriculture. Many have predicted that we may be poorly equipped to respond to major food animal disease outbreaks or bioterrorism threats. While keeping these views in perspective, it is clear that the profession can no longer ignore the contributions it can make to the growing animal, human and environmental needs of society.

The late Dr. Otto Radostits, suggested the future of bovine practice is likely to entail the following: a continued demand for safe and wholesome meat and milk and the sustained industrialization of animal agriculture; the increasing importance of the herd as the unit of concern regarding health and production; attention to animal well-being and the environment; utilization of modern technologies and informatics; and new strategies to ensure and improve the education of new bovine practitioners.[9]

Meeting the demands of society for safe and wholesome animal products encompasses many aspects of food animal veterinary medicine. Obviously, maintaining overall health and productivity of herds will serve as the foundation. This will entail the control, prevention, and management of infectious and non-infectious diseases, expertise in nutrition and feeding systems, housing and environments, and the optimization of reproductive performance. It will also include the prevention of zoonotic diseases, avoidance of residues, acting as advocates for animal well-being, and preparing to control and prevent emerging and foreign animal diseases.

As bovine practitioners expand their services in herd health and production management, less attention will be concentrated on individual animal care aside from the training of producers and their workers. Compensation for veterinarians working solely with cattle will have to shift from a fee-for-service approach to a consultation–oriented service focused on the financial performance of the enterprise.

A significant responsibility of food animal veterinarians is to advise and encourage livestock producers regarding standards of animal well-being that comply with laws and interests of society. Similarly, it is imperative that veterinarians be versed in environmental issues relating to animal agriculture. Without doubt, the intensified conditions of modern food animals has become a main thrust of animal welfare and environmental concerns. Accordingly, modern food animal practitioners must not only be knowledgeable in these areas, but act proactively to establish and maintain sound practices relating to animal well-being and the environment.

Advances in information technology will continue to have an important impact on advances in food animal veterinary medicine. Computer programs for dairy and beef health and production management will continue to improve. Information found on the internet will continue to expand and provide access to veterinary literature and state-of-the-art information. Digital imaging will become faster, more convenient, and less expensive. Methods for individual animal identification and tracking will aid in the control of infectious diseases and implementation of biosecurity measures.

Arguably, there has been a steady erosion of food animal versus companion animal veterinary education such that the latter dominates the educational decision making process in veterinary colleges. In many institutions, veterinary students are primarily exposed to "patient-centric" veterinary medicine which follows the human physician model.[10] Exposure to food animal practice and the advantages of living in rural communities is typically not part of this paradigm. Clearly, leadership within the profession and academia must recognize this and adjust accordingly if we are to meet the needs of society. Substantive efforts directed at mentorship, student recruitment and targeted admissions might be a place to start. Support of current and future state and federal legislative efforts is also necessary. In a 2004 editorial, Chenoweth mentioned that several "truisms" relating to food animal veterinarians need to be challenged.[11] Notably,

Food animal practice is not dead;
Rural animal practice can be an attractive career choice;
Food animal services are of national concern;
Student selection processes can favor food animal-oriented applicants;
And economics need not be the sole motivation for new graduates.

The history of veterinary medicine has been one of growth and adaptation to the needs of society. Today, the discipline relating to food animals is being challenged by various forces ranging from projected shortages of qualified personnel, to economic challenges and deficiencies in training future graduates. Despite these challenges, veterinarians interested in working with food animals have tremendous opportunities. Combining current interests and attention with a well-planned vision to shape the profession can likely ensure food animal veterinarian's relevance and contributions to society.

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