

The Role of Individual Animal Diagnosis and Treatment in the Training of Food Supply Veterinarians

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Abstract

Instruction in individual animal skills remains a core component of food supply medicine education. Recent surveys clearly demonstrate that food animal practitioners consider individual animal medicine skills to be central to the practice of veterinary medicine. Instruction in individual animal medicine skills can occur in a variety of venues, including in-house medicine and surgery, traditional ambulatory practice, specialized instruction in production medicine, and private practiced-based instructional experiences. The traditional in-house clinical rotation has both advantages and disadvantages in the instruction of veterinary students. Optimal instructional experiences should attempt to match both the content and context of instructional experiences with students' future professional employment.

Keywords: veterinary, student, education, training

Résumé

L'apprentissage des compétences au niveau de l'animal demeure une composante clé de l'éducation en médecine de production animale. Des questionnaires récents ont clairement démontré que les praticiens des animaux de la ferme considèrent les compétences en médecine au niveau individuel comme étant au cœur de la pratique en médecine vétérinaire. L'enseignement en médecine au niveau de l'animal peut se faire dans différents contextes incluant la formation interne en médecine et en chirurgie, la pratique ambulatoire traditionnelle, l'enseignement spécialisé en médecine de production et l'enseignement en pratique privée. La rotation clinique interne traditionnelle a des avantages et des inconvénients dans l'enseignement des étudiants vétérinaires. Les pratiques optimales d'enseignement devraient apparier à la fois le contenu et le contexte de l'apprentissage au type d'emploi professionnel futur des étudiants.

Employment Venues in Private Veterinary Practice

Food supply veterinary medicine remains a core component of the employment equation for US veterinary school graduates. As recently as 2006, 2.4% of new graduates entered large animal exclusive practices, 2.9% entered large animal predominant practices, and 8.7% entered mixed animal practices.¹ Of these same new graduates, 34.9% entered small animal exclusive practices, 9.8% entered small animal predominant practices, and 4.7% entered equine exclusive practices for a total of 63.4% of new graduates entering private clinical practice.¹ Consequently, approximately 22% of new graduates who enter private veterinary practice embark upon careers with a significant food animal practice component. Despite concerns or commentary regarding the impending demise of food animal practice, the proportion of new graduates with significant involvement in food animal practice has remained stable since a preceding 2003 survey.² Additionally, career paths focused on governmental, institutional or corporate service typically place a premium on knowledge and skills related to food supply medicine because many of these careers focus on the safety of foods of animal origin, the protection of livestock industries and sustainable economic development, and the prevention of zoonotic disease. Consequently, the delivery of a sound education in food supply medicine is a core component of a quality veterinary education.

Available Instructional Venues

Veterinary colleges in the US provide food supply education in a variety of formats or venues. Commonly reported or described venues include in-house medicine and surgery of individual animals, ambulatory care of individual animals and herds, consultative services to herd owners, structured laboratory instructional exercises, and practice-based experiences. There is great

variation among US veterinary colleges in which formats they use to deliver instruction in food supply medicine. A number of veterinary colleges have discontinued offering traditional ambulatory services, and in-house, or in-hospital, food animal caseloads vary dramatically among US veterinary colleges. In a 2002 report, the range of in-house agricultural animal caseloads varied from a low of 183 cases/yr to a high of 1,765 cases/yr.³

It is possible that schools with low in-house caseloads may be choosing to meet their educational goals by emphasizing alternative instructional venues. Work by Daart *et al* suggests that many critical instructional experiences were as likely or more likely to occur in a private practice based ambulatory instruction model as in an in-house medicine and surgery model.⁴ Furthermore, students perceived the quality of instruction in these experiences was in fact better than that delivered in a more traditional setting.⁴

The Importance of Individual Animal Medicine Skills for Entry-level Practitioners

The argument can be made that in-house instructional experiences are passé in the training of a modern food supply veterinarian. The assertion that the primary employment venue for the food supply veterinarian has changed to the point where the in-house instructional model is flawed must at least be considered. Exclusive food animal practices are typically premised upon the delivery of services in an ambulatory environment. Additionally, the role of the veterinary practitioner in these food animal exclusive practices has shifted to place greater emphasis on consultation rather than on the direct delivery of diagnostic and therapeutic services to individual animals. Thus, the argument can be made that the examination and treatment of individual animals in a hospital setting is non-representative of modern food animal practice, and as such, lacks relevance in the education of future food supply veterinarians.

Before this argument is accepted the current landscape of food animal practice should be critically examined. Although exclusive food animal practices with a predominant consultative role are increasing in frequency, mixed animal practices remain common. The proportion of new graduates gaining employment in mixed animal practices greatly exceeds the proportion engaged in large animal exclusive practices, suggesting that an exclusive focus on large herd consultative education delivered in an ambulatory setting may not provide an optimal educational experience for many veterinary students.¹

Results of a recent survey by Morin *et al* highlight this consideration.⁵ In this study, 1030 veterinarians engaged in either bovine, large or mixed animal practice were asked to evaluate the frequency at which they per-

formed 95 skills and procedures, and to determine the entry level proficiency they expect of new graduates for that particular skill. The list of 95 skills or procedures included 53 related to individual animal medicine and 42 skills or procedures related to animal production or herd health. With regard to the frequency that practitioners performed specific skills, the 11 most frequently performed procedures all were individual animal medicine skills, and only four of the 20 most frequently practiced skills related to population medicine, which were referred to as livestock production in the manuscript. When asked about entry level proficiency, the 17 skills for which practitioners ranked the highest were uniformly individual animal medicine skills. Clearly, private food animal practitioners continue to value individual animal diagnostic and treatment skills. Practitioners consider these skills to be a vital and central component of their practice of veterinary medicine.

In food animal exclusive practices with a predominant focus on herd health or consultative practice, individual animal medicine skills continue to be valued. Consultative practitioners must have mastered individual animal examination and treatment skills to effectively perform their employment tasks. Although these practitioners may not perform individual animal activities with the same frequency as other practitioners, they often bear primary responsibility for the instruction of farm managers and employees, creation of standard operating procedures, and monitoring the performance of employees in animal health related tasks.

Advantages of In-house Instructional Experiences

In-house clinical instruction provides a unique laboratory for detailed, intensive instruction in clinical examination and diagnosis. These skills remain critical in the practice of food supply medicine. The first stage in most farm-based interventions or outbreak investigations is characterization of the specific problem, and the process of diagnosis is central to this characterization. In much the same manner as the whole exceeds the sum of its parts, the characterization of a herd or population problem hinges upon accurate and timely diagnosis of individuals.

In-house instructional experiences offer several unique advantages. Animals are handled, examined, and treated in a controlled environment. Restraint facilities are superior to those present on most farms. Students with limited background and experience in livestock handling and husbandry are given the opportunity to become engaged in the diagnosis and treatment of disease in a safer and less threatening environment.

In-house practice is less time sensitive than is the ambulatory delivery of services and instruction. With

hospitalized patients, students have the freedom to perform repeated examinations free from the watchful, critical, and potentially impatient gaze of an owner or caretaker. The time constraints dictated by the daily routine of a large production unit are minimized. Students have greater freedom to engage in self-directed study in preparation for cases or procedures. Hence, the clinic environment fosters the creation of lifelong learning skills. Patient responses to treatments or interventions can be readily and frequently monitored. Less than optimal responses can be observed and interventions altered to provide more favorable outcomes.

The in-house environment permits greater involvement of ancillary support and diagnostic services and procedures in case management. Delays associated with sample collection, submission, processing, and reporting of test results are minimized. The necessity of repeated visits to farms is eliminated, therefore, hematology, serum chemistry, and diagnostic imaging are more readily accessed in an in-house setting. It is worth noting that these testing modalities are not frequently used in private ambulatory practice, and their routine application is limited by both time and economic constraints. The application of these test modalities to clinical instruction may increase a student's understanding of physiology and disease pathogenesis, but may provide an inaccurate picture of practice realities.

The in-house environment permits instruction of students in the concepts of tertiary and intensive care. Although owners of most commercial livestock do not desire these services, a proportion of owners have high level expectations. Instruction regarding these concepts and expectations is problematic in an ambulatory setting. This strength of in-hospital instruction becomes more relevant as livestock values increase. Beef replacement heifers are commonly valued at \$1,000, and historically dairy replacement heifers are twice as valuable. Consequently, the argument can be made for quality care of individual animals, which may entail the direct delivery of services by veterinarians. The in-hospital service provides a valuable, but not exclusive, venue for this type of instruction.

Disadvantages of the In-house Experience

The most serious reservation regarding traditional in-house instructional experience relates to a content and context which often fails to match that of private food animal practice. In an idealized clinical instructional environment, students would examine the same species they will see in practice, and the animals would reflect the same industry or commodity group they will serve in practice. They would examine and treat animals in settings representative of private clinical practice. Finally, the delivery of services would

occur under an economic paradigm reflective of their future careers.

In many instances the in-house teaching caseload at veterinary colleges is, however, non-representative of private veterinary practice and the expectations of potential employers and clients. The species composition of many veterinary teaching hospital caseloads differs dramatically from livestock cared for by private practitioners. The problems, diseases, and conditions of hospital accessions may differ dramatically from those seen in private clinical practice, particularly if the teaching hospital has a predominant referral caseload.

Perhaps the most glaring example of species differentiation of teaching hospital caseloads from private practice caseloads occurred following the initial popularity of ratite husbandry in the United States. At one point in the 1990s, a number of US veterinary teaching hospitals admitted, examined, and treated several hundred ostriches and emus per year. Today, few veterinarians have private veterinary practices with a significant ratite component. The supposition can be made that these experiences in ratite medicine did not meaningfully enhance the education and practice readiness of the veterinary students who were involved in this clinical instructional effort. It is tempting to extrapolate from these observations to other emergent species of livestock for which commercial markets have not been established.

The jobs analysis performed by the National Board of Veterinary Medical Examiners in 2003 provides us a unique opportunity to monitor the expectations and needs of the veterinary profession.⁶ The committee which conducted this survey-based exercise consisted of eleven practitioners. The predominant source of committee members was private veterinary practices, and only one academic veterinarian served on this committee. Input was solicited from 3098 randomly selected North American veterinarians. The sample was constructed to reflect the totality of the North American veterinary profession. Based on this input, the committee developed a template for the North American Veterinary Licensing Examination (NAVLE) which assigned 17% of the NAVLE to bovine items, 4% to swine items, and 3% to small and wild ruminants.⁷ If we extrapolate from these figures, the optimal instructional caseload in food animal medicine and surgery would entail 70% cattle (17/24%), 16% swine (4/24%), and 12% small ruminants (3/24%). Deviations from these proportions could be dictated by historical graduate employment choices and the size and scope of a state's livestock industries. Alternatively, census data reflecting the size of local agricultural industries could be used to direct the development of goals for an optimal instructional caseload.

Advocates of a comparative instructional approach might make the case that an animal of a minor species

is of equivalent instructional values to a major species. The value of the comparative approach has long been recognized as one of the inherent strengths of veterinary training. Arguments supportive of comparative instructional approaches are particularly valid if the contextual framework of the individual case mimics student career goals. However, if we were to carry the argument favoring comparative approaches to its logical endpoint, we would then assert that veterinary students need only become well versed in dog and cat practice and that all efforts in large animal instruction could be premised upon extrapolations from companion animals. Few, if any, large animal practitioners would accept this argument. If instructional caseloads are non-reflective of the student's future career, then these experiences may be of lesser value and may be counterproductive if these experiences undermine student appreciation for the role of economic constraints in the practice of food supply medicine.

Recommendations

Colleges should develop food animal caseloads and alternative instruction models reflective of student, veterinary profession, and societal needs and goals. Consequently, the optimal clinical and instructional experiences in individual animal medicine will likely have certain characteristics, regardless of the instructional model chosen by a veterinary college. Instructional experiences should be reflective of local and national livestock industries, i.e., common species and common conditions, and should attempt to prepare students for known and anticipated employment venues. The instructional practice of food supply medicine should consider both economic and regulatory constraints related to livestock health and husbandry to better prepare students for realities of modern food supply medicine. The primary focus of instructional experiences should then be the routine or mundane, rather than the unique.

Instruction in individual animal care should be viewed as one component of a larger instructional goal. If demographic and economic limitations preclude the maintenance of an adequate and appropriate instructional caseload, specialized laboratory experiences may provide a strategy to deliver core, baseline instruction in the realms of physical examination, diagnosis, and individual animal treatment. This specialized instruction will likely form a basis for continued instruction in ambulatory and/or private practice settings which more closely match the realities of the marketplace. It is imperative that individual animal instruction be viewed

as a part of a larger instructional goal, rather than an end to itself. Perhaps the strongest evidence supporting the preceding statement is the near complete absence of specialty-trained, diplomate internists and surgeons in private food animal practice. In food supply medicine the primary goal remains the instruction of well trained generalists, rather than specialists. If a private food animal veterinarian pursues a specialized career, this focus will likely be centered on a specific livestock industry or commodity (beef, dairy, swine, etc.), rather than a singular clinical discipline (medicine, surgery, etc.).

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