

## Letters to the Editor

### Emphasizing one health

The recent commentary<sup>1</sup> from Drs. Nielson and Eyre represents, we hope, the beginning of an urgently needed dialogue on the direction of veterinary medicine and, more specifically, veterinary education in the 21st century.

Nielsen and Eyre propose a clinical career track in one health that would focus on what they call “ecological medicine” and integrate knowledge on disease dynamics with information on ecology and the environment.

This is an important step forward, but we believe it does not go far enough, because understanding the interaction between animal and environmental health also requires knowledge of the interplay between social, technological, and economic factors. Sustainable development of the livestock industry in an economically viable manner, for example, is contingent on the use of technology to improve productivity and enhance market access.

Global food security, especially relief from poverty and hunger, is a complex one-health issue that depends on accountable economic growth and investment. Indeed, the first 2 of the United Nation’s Sustainable Development Goals<sup>2</sup> call for countries around the world to “end poverty in all its forms everywhere” and “end hunger, achieve food security and improved nutrition and promote sustainable agriculture.” However, as Jimmy Smith,<sup>3</sup> director general of the International Livestock Research Institute, pointed out during his keynote address at the 2013 Global Animal Health Conference, “global food security will not be achieved without improved animal health and productivity.” Thus, veterinarians can play a lead role in reducing poverty and hunger and transforming both rural economies and the social structure of the developing world by applying their knowledge and skills to advance the “livestock revolution,” eliminate endemic

zoonotic diseases, and respond to the burgeoning urban demand for animal-based protein.

Food safety is another growing concern that does not fit easily within the confines of “ecological medicine.” Angelos et al<sup>4</sup> have proposed a one-health approach to food safety, and several veterinary colleges have courses in one health. However, international careers in one health and development require competencies beyond those of the traditional veterinary medical curriculum.

Currently, veterinary medicine has more opportunities and responsibilities in the areas of comparative medicine, disease dynamics, agriculture, and global economic and social development than it can readily handle. The profession and, particularly, veterinary academia in the United States needs to engage in a dialogue that addresses the boundaries of one health, along with how the profession can help build capacity to meet the developing world’s needs and resolve differences between environmental sustainability needs, livestock farming, and burgeoning cities.

This dialogue should promote cross-disciplinary and cross-institutional collaborations and integrate the profession’s varied one-health interests into a strategic framework that guides veterinary academia to effectively contribute to economic, social, and environmental sustainability. Potential collaboration and advice from experts in human medicine,

agriculture (including the Association of Public and Land-grant Universities), wildlife management, business, nongovernmental organizations, and other stakeholders should be included with an eye toward discovering potential areas of support.

In Washington, DC, the Association of American Veterinary Medical Colleges sits in the midst of a wealth of talent from which it could form an international advisory committee to help focus and guide the future direction of one health. We would encourage it to take on this task.

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Letters containing defamatory, libelous, or malicious statements will not be published, nor will letters representing attacks on or attempts to demean veterinary societies or their committees or agencies. Viewpoints expressed in published letters are those of the letter writers and do not necessarily represent the opinions or policies of the AVMA.

1. Nielsen NO, Eyre P. Tailoring veterinary medicine for the future by emphasizing one health. *J Am Vet Med Assoc* 2017;251:502-504.
2. United Nations. Sustainable Development Goals. Available at: [www.un.org/sustainabledevelopment/](http://www.un.org/sustainabledevelopment/). Accessed Sep 11, 2017.
3. Smith JW. Global health and sustainable food security: why livestock sectors in developing countries matter. Global Animal Health Conference on Developing Global Animal Health Products to Support Food Security and Sustainability, Arlington, Va, October 2013.
4. Angelos JA, Arens AL, Johnson HA, et al. One health in food safety and security education: a curricular framework. *Comp Immunol Microbiol Infect Dis* 2016;44:29-33.

### The authors reply:

We are encouraged that these leaders in veterinary education believe that our proposal “does not go far enough” and agree that the important issues they raise are among those the profession needs to address. The term “ecological medicine”<sup>1</sup> has not been well-defined in actual practice. Nevertheless, because the utility of ecological medicine is driven by increasing global biophysical and socioeconomic connectedness, it must inevitably address all of the issues raised by the respondents.

Ecological medicine can become that part of an all-encompassing approach for managing ecosystem health that is appropriate to veterinary medicine. Such an approach to developing environmentally related societal policies would involve obtaining the multiple perspectives of all stakeholders affected by the goals at hand. Often, obtaining agreement can be difficult because of differences in opinion as to what constitutes a healthful goal. Veterinarians can assist in this process by applying their expertise in one health.

We agree that the Association of American Veterinary Medical Colleges must be involved in any substantial, organized effort to chart new directions for veterinary medicine's role in society. Additionally, we believe that our professional associations, including the AVMA, must be full partners if not leaders in such an endeavor. They hold the keys to changes that, in our view, must

include veterinary college accreditation and licensing to practice.

We also want to respond to another comment we have received from Michael W. Fox regarding the importance of bioethics<sup>2</sup> in the development of one-health goals. To take into account the environment and ecosystems as well as people and animals, we have heretofore defined health broadly as the capacity to maintain organization (eg, sustainability and homeostasis) and to achieve reasonable goals of people at scales ranging from individuals to the globe. We would amend this to “reasonable *and ethical* goals.” More generally in regard to goals for one health, it is worth noting that Queenan et al<sup>3</sup> recently advocated for incorporating the United Nation's Sustainable Development Goals in making one health an operational concept.

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1. Nielsen NO, Waltner-Toews D, Nishi JS, et al. Whither ecosystem health and ecological medicine in veterinary education. *Can Vet J* 2012;53:747-753.
2. Fox MW. Holistic veterinary medicine: veterinary challenges and opportunities in a changing world. *J Am Holistic Vet Med Assoc* 2016;45:12-19.
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### Heartworm incidence appears to be increasing in the United States

Earlier this year, the American Heartworm Society (AHS) released results of their 2016 heartworm incidence survey,<sup>1</sup> which indicated that the average number of dogs per clinic in which heartworm disease had been diagnosed increased by 21.7%, compared with results of their 2013 survey.

To investigate this issue further, we analyzed results compiled by the Companion Animal Parasite Council (CAPC) for blood samples collected from dogs across the United States during 2013 through 2016 and submitted to Antech and Idexx Laboratories for heartworm testing. Results for approximately 7 million canine heartworm antigen tests performed by these commercial diagnostic laboratories were reported to CAPC during 2013, and thereafter, the number of test results increased annually, to > 9 million in 2016.

Analysis of these data revealed that the percentage of samples positive for *Dirofilaria immitis* antigen increased from 1.11% in 2013 to 1.18% in 2014, 1.23% in 2015, and 1.28% in 2016, representing a 15% increase in the percentage of positive test results between 2013 and 2016. Given the number of tests performed, this equated to > 40,000 additional dogs with positive test results in 2016, compared with 2013.

This 15% increase in the percentage of positive heartworm antigen test results between 2013 and 2016 was similar to the 21.7% increase reported by the AHS in the average number of dogs per clinic in which heartworm disease was diagnosed. Given these findings, it appears likely that the incidence of heartworm disease among dogs in the United States is increasing, despite the widespread availability of prescription heartworm preventatives.

The AVMA estimated that in 2012, there were approximately 70 million pet dogs in the United States.<sup>2</sup> However, analysis of proprietary dispensing data from Vetstreet LLC, Trevose, Pa (National Estimate, Practice Dispensing Data, 2013-2016, E-168), suggested that only about 56 million dogs visited veterinary clinics in 2016. These same data indicated that although there was a 2.9% increase in the number of canine heartworm preventative doses dispensed, from 166.7 million in 2013 to 171.5 million in 2016, there were just under 20 million dogs for which at least 1 dose of a heartworm preventative was

dispensed. In addition, the average number of doses dispensed was only 8.6 doses/y, despite the fact that both the AHS and CAPC recommend that dogs receive preventatives year-round.<sup>3,4</sup> More worryingly, according to the Vetstreet data, the percentage of dogs visiting clinics for which at least one dose of heartworm preventative was dispensed has decreased, and was a full percentage point lower in 2016 than in 2013. This small, but notable, decrease represented a missed opportunity for prevention in > 500,000 dogs.

With the incidence of heartworm disease apparently increasing despite increased dispensing of heartworm preventatives, the impact of emerging resistance to macrocyclic lactones<sup>5</sup> should not be discounted. Still, there is

substantial room for improving year-round prevention. Further investigation of heartworm incidence and of the prevalence of resistant heartworm strains is warranted. Meanwhile, veterinarians should follow the AHS and CAPC guidelines regarding heartworm prevention strategies.

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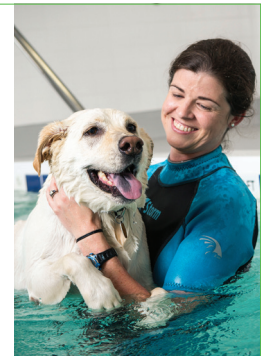


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