Letters to the Editor

Lateralization of the diaphragm

I enjoyed reading the article by Gilman and Ogden,[1] and I commend the authors for bringing to light a useful technique that seems to have been swallowed by time and likely is not widely known as a viable option for select cases. It is unfortunate the authors and reviewers were unaware of an almost identical report[2] my 2 coauthors and I published in the *Journal of the American Animal Hospital Association* in 2010.

It would be great to see a published report on a series of these cases, because they do not appear to be terribly common, at least in my experience. That said, I have been performing this procedure on appropriate cases for more than a decade now, and I am very grateful to my mentor Dr. David Merkley for sharing this technique with us. If I recall correctly, he learned the technique from human surgeons with whom he had worked. I have yet to have a complication with this technique and find that placing stay sutures to plan the reconstruction is helpful. It is also not critical to encircle the ribs with ligatures. Keep up the good work.

Mauricio Dujowich, DVM
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1. Gilman OP, Ogden DM. Lateralization of the diaphragm for thoracic wall reconstruction in a dog. *J Am Vet Med Assoc* 2021;258:85–88.
2. Hall A, Dujowich M, Merkley DF. Diaphragmatic support of a thoracic wall defect in a dog. *J Am Anim Hosp Assoc* 2010;46:341–345.

The authors respond:

It is great to hear that our article has received engagement from *JAVMA* readers and helped further scientific discourse on the topic.

As we wrote in the report, at the time of writing, neither I nor my colleagues were aware of this technique being described previously and had not found Dr. Dujowich's publication during our literature searches or review of surgical texts. I profusely apologize for the oversight and absolutely do not want Dr. Dujowich's previous endeavors to go unrecognized, so I am happy to correct the record. However, I believe there are differences between the 2 reports and the locations that the diaphragm is lateralized to fill, thus making our report a useful addition to the evidence base.

It was not in any way the authors' intention to ignore the work of the previous authors, and we hope that this report and letter can bring further recognition to their previous work.

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Emergency medical training for veterinarians

I was delighted to read the recent story[1] in *JAVMA* News about the development of a program to train and certify veterinarians as emergency first responders. On a related note, I believe it is past time that we encourage veterinarians, and even high school and college students wanting to become veterinarians, to take emergency medical training (EMT). This training is often offered by local fire companies. I went through it a few years ago and realized this training and experience would be valuable to any medical professional. The earlier in the education experience, the better. My EMT training and ambulance-riding experience also taught me about morals, character, and how to work under pressure.

I grow concerned when I hear that courses such as medical vocabulary have been dropped from preveterinary requirements, but organic chemistry is still being used to weed out some applicants. Why not require more courses like EMT that have information useful to any medical professional?

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1. Larkin M. Certificate in the works for veterinary first responders. *J Am Vet Med Assoc* 2021;258:107–108.

Crisis in veterinary medicine

Veterinary medicine prides itself on addressing societal needs, but the number of recent pandemics, growth in food insecurity, and need to manage the complexity of livestock farming's environmental, economic, and social costs all suggest that the profession needs to pay more attention to these vital, expanding responsibilities. The one-health approach, although complex, provides the breadth necessary for veterinary college curricula to meet the multitude

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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.

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of challenges presented by the rapidly changing dynamics of food systems safety and security in the 21st century.

Emerging and endemic diseases annually cost millions of lives and billions of dollars,[1] reflecting the veterinary profession's difficulties in addressing the disruptions associated with infectious diseases, pollution, climate change, and the dynamics of livestock farming. The one-health approach promotes the interrelationships of animals, people, and the environment and represents a platform for understanding the scope of these challenges. Currently, however, one-health efforts are primarily driven by the veterinary community and focus on research, with little evidence of the changes in academic curricula needed to broaden students' horizons and inspire them to address the daunting challenges ahead. Such challenges involve not just livestock's role in food safety and security, but food systems, social well-being, urbanization, the environment, and technological change. Infectious agents, toxins, and chemical or climatic disasters can disrupt food systems and threaten food safety, trade, and national economies.

Because it brings together multiple disciplines, a one-health approach is essential for addressing the complexity of livestock farming and formulating food safety and security policies acceptable to the range of stakeholders involved. With the veterinary profession's origins in food safety, food security, and public health, veterinarians must play a central role in defining these debates. In the past century, veterinary public health inspectors and private practitioners have teamed up to mitigate brucellosis, bovine tuberculosis, echinococcosis, and more. Animal and human waste contamination causes 45% of raw-produce foodborne disease outbreaks,[2] but veterinary medicine and academia have diminished the profession's engagement in food hygiene and safety. The current coronavirus outbreak disrupted the food sector in part because infected food handlers contaminated raw foods. Food safety starts on the farm,

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and rural veterinarians are the first line of defense against such contaminants entering the food system, but rural veterinarians in the United States have dwindled to less than 8% of the profession, and they are aging.[3]

Veterinary academia lags in integrating the multidisciplinary dialogue of the one-health approach into current training programs, yet doing so is essential if our profession is to continue serving society in securing a safe and sustainable food system.[4] Although complex and difficult to teach, the one-health concept should be a required course for every veterinary student. No other profession is better positioned to grasp the dynamics of the one-health approach and the livestock sector's multiple beneficial and harmful impacts on society and the environment. To secure a safe, sustainable, and economically viable food supply, veterinary graduates must be prepared to take crucial leadership roles in shaping informed one-health policies and investments in livestock farming and food safety in a rapidly changing, increasingly complex, and warming planet.

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3. USDA National Institute of Food and Agriculture. Veterinary Medicine Loan Repayment Program: five-year review 2010–2015. Available at: nifa.usda.gov/sites/default/files/resource/VMLRP-Five-Year-Internal-Review.pdf. Accessed Feb 22, 2021.
4. Gray GC, Mazet JAK. To succeed, one health must win animal agriculture's stronger collaboration. *Clin Infect Dis* 2020;70:535–537.

Unique sensitivity of dogs to tartaric acid and implications for toxicity of grapes

The ASPCA Animal Poison Control Center has received several reports of dogs exposed to potassium bitartrate (cream of tartar). In one report, exposure to 2 teaspoons of cream of tartar resulted in acute vomiting and severe azotemia with serum creatinine concentration of 5.9 mg/dL (reference range, 0.5 to 1.8 mg/dL) and isosthenuria within 30 hours. In another report, a dog that ingested homemade play dough made with cream of tartar developed severe vomiting and azotemia (creatinine, 8.5 mg/dL) within 24 hours. The dog was euthanized, and renal histopathologic changes were similar to those described with grape and raisin toxicosis in dogs, including cortical tubular degeneration, necrosis, and mineralization, with some evidence of regeneration.

Potassium bitartrate is the salt of tartaric acid, and both potassium bitartrate and tartaric acid are uniquely present in high concentrations in grapes and tamarinds. Older studies have demonstrated species differences in absorption, elimination, and toxicity of tartaric acid and its sodium salt, potassium sodium tartrate (Rochelle salt), with dogs identified as having substantial absorption and rapid, high renal elimination.[1] Information regarding the toxicity of potassium bitartrate in animals is lacking, although one study[2] found obstructive nephropathy in rats. Tartrates are considered to have a wide margin of safety in humans, but there is a report[3] of hyperkalemia following ingestion of cream of tartar in a human. In humans, tartaric acid is fermented by colonic bacteria to produce short-chain fatty acids, and absorption following ingestion is low.[1,4]

The amount of tartaric acid and potassium bitartrate in grapes varies with type, growing conditions, and ripening. At the beginning of ripening, tartaric acid concentrations may reach 20 g/L (2%) and, in general, range between 3.5 and 11 g/L (0.35% and 1.1%).[5] The amount of acid in grapes at harvest is commonly studied for wine-making purposes, but it is unclear whether the amounts described include the potassium bitartrate salt, which increases at the expense of free tartaric acid concentrations during ripening. In dogs, ingestion of grapes at doses of 20 to 150 g/kg (0.32 to 2.4 oz/lb) has been reported to result in nephrotoxicosis.[6] Assuming a tartaric acid content of 1%, this would represent tartaric acid doses of 196 to 1,484 mg/kg (89 to 675 mg/lb), consistent with the nephrotoxic range found in tartaric acid studies involving dogs.[1] Another source[4] reported that 5 g of cream of tartar is approximately equivalent to the amount of tartaric acid in 120 g (4.2 oz) of raisins. For a 10-kg dog, this would be a dose of 0.5 g of tartaric acid/kg (0.23 g/lb) or 12 g of raisins/kg (0.19 oz/lb), which is consistent with reported toxic doses of raisins (2.8 to 37 g of raisins/kg [0.045 to 0.59 oz/lb]).[6] Interestingly, the ASPCA Animal Poison Control Center has had reports of severe vomiting and acute renal failure in dogs following large exposures to tamarinds, which are also uniquely high in tartaric acid.

Owing to the similar clinical courses (vomiting and acute renal failure) and histologic findings following ingestion of potassium bitartrate and grapes in dogs as well as the demonstrated dog susceptibility to tartaric acid, we propose that tartaric acid and its salt, potassium bitartrate, are the toxic principles in grapes leading to acute renal failure in dogs. Variable concentrations may explain the inconsistency in clinical signs in dogs following grape and raisin ingestion. Furthermore, excess tartrates are removed (detartrated) from commercial wine and juice products to protect flavor and ap-

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pearance. This removal of potassium bitartrate from processed products could account for the lack of toxicosis following ingestion of products such as juice, jam, and wine.

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4. Spiller GA, Story JA, Furumoto EJ, et al. Effect of tartaric acid and dietary fibre from sun-dried raisins on colonic function and on bile acid and volatile fatty acid excretion in healthy adults. *Br J Nutr* 2003;90:803–807.
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