January – March 2000

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THOUGHT FOR THE MONTH

When working with others, it is better to pull your own weight, rather than to throw it around.

Anonymous

Kent C. Roberts, DVM
Extension Veterinarian

This newsletter is published quarterly in support of the outreach program of the Veterinary Teaching Hospital VMRCVM, Blacksburg, VA and is prepared for and distributed to veterinarians in the Mid Atlantic Region.
Giardiasis and Cryptosporidiosis – the Zoonotic Potential

In 1993, the worst outbreak of a waterborne disease in modern U.S. history occurred in Milwaukee, Wisconsin, when parasites infiltrated the city’s drinking water. An estimated 403,000 people suffered severe bouts of watery diarrhea and more than 100 people are estimated to have died from contracting Cryptosporidium, which contaminated the city’s tap water. This organism was small enough to slip through the filters of Milwaukee’s water treatment system and was resilient enough to survive chlorination. A compounding factor was that one of the Milwaukee’s water treatment plants was not operating properly.

As a result of this experience, protecting watersheds that supply water to the nation’s largest metropolitan areas has become a national priority. The key is to protect these water supplies at their source and not limit treatment options to chemicals or filtration. This is where our parasitology efforts are focused—in the reservoirs of New York City.

Monitoring a watershed that encompasses 2,000 square miles and provides drinking water for some 9 million New York City residents is a special problem. There are many potential sources of water contamination with these parasites, one of which is runoff from upstate farms.

So how does one approach such a problem? The starting point is research, to determine the extent of the risk. As part of the multi-agency NYC Watershed Agricultural Program, the Diagnostic Lab’s Parasitology section has been involved since 1992 in helping define the problem and in efforts to eliminate the contamination of the watershed by Giardia sp. and Cryptosporidium parvum.

These protozoa inhabit the small intestines of many wildlife species, human beings, and domestic animals throughout the world. They are spread from animal to animal by consuming food or water contaminated with fecal material containing infective cysts, or by animal-to-animal contact. Only one animal is needed to complete the life cycle, which takes about one week. It is not known how many cysts are needed to cause infection, but it is thought to be 10 or fewer.

Infection in animals may be asymptomatic even when cysts are found in the feces. When there is illness, Giardia and Cryptosporidium cause the same symptoms: profuse watery-smelling diarrhea, gas, excess fat in the feces due to malabsorption, weight loss or limited weight gain, and dehydration. In people with normal immune systems, disease is self-limiting and usually resolves in a matter of weeks or months. For those who are immunocompromised, disease can continue indefinitely. Cryptosporidiosis may result in debilitation due to protracted diarrhea, and can lead to death.

Based on a survey of nearly 3,000 dairy cattle of all age groups from 109 dairy herds in the region, Giardia was found on 76 farms with an overall prevalence of 9%, while Cryptosporidium parvum was detected on 14 farms with a prevalence averaging 1%. Young animals were more likely to be infected with Giardia than were older animals, but C. parvum infections were found only in calves 30 days of age or younger.

From these studies, we were able to validate ELISA tests for detection of Cryptosporidium antigens in calves, and of Giardia antigens in dogs and cats. We are also evaluating these tests for other domestic and wild animal species. If veterinarians suspect either of these infections in their patients, how would they determine which assay would be better—the ELISA or fecal flotation? According to Dr. Susan Wade, of Cornell University’s Diagnostic Parasitology Laboratory, it is a good idea to do both since eggs and oocysts of other parasites can be picked up on flotation, and the ELISA can help to confirm the flotation results or detect positive animals which are not shedding cysts. – Abstracted from: Diagnostic Laboratory Bulletin. Vol. 3, Issue 2, Fall 1999. Cornell University, Ithaca, NY. Reprinted with permission.

Worth Noting

These days, pennies are 97.5% zinc.

How Many Did You Get Today?

In 1998, the credit card industry mailed out 3.4 billion solicitations to prospective customers. Problems in the industry have resulted in new fees and fee increases (annual, late payments, etc.) which now account for approximately 20% of all credit card revenue.
Plasma Lactate Predicts Survival of Gastric Dilatation-Volvulus

Reported survival rates for dogs with gastric dilatation-volvulus (GDV) vary from 67% to 87%. Gastric necrosis has been found to be one of the most important predictors of postoperative complications and death, and although survival rates for dogs with GDV have improved overall, survival rates for dogs with gastric necrosis are still low. Accurate methods of predicting preoperatively which dogs will develop gastric necrosis would be helpful in determining prognosis.

The first objective of this study was to determine the relationship between plasma lactate concentration and outcome for dogs with gastric dilatation-volvulus. Information on signalment, history, plasma lactate concentration, medical and surgical treatment, cost of hospitalization, and outcome was retrieved from medical records for 102 dogs. Sixty-nine of 70 (99%) dogs with plasma lactate concentration <6.0 mmol/L survived, compared with 18 of 31 (58%) dogs with plasma lactate concentration >6.0 mmol/L. This suggests that plasma lactate concentration can be used as a prognostic indicator for dogs with GDV and that given the same level of care, dogs with plasma lactate concentration <6.0 mmol/L have an excellent prognosis for survival.

The second objective was to determine the relationship between gastric necrosis and plasma lactate concentration. Gastric necrosis was identified in 38 (37%) dogs. Median plasma lactate concentration in dogs with gastric necrosis (6.6 mmol/L) was significantly higher than concentration in dogs without gastric necrosis (3.3 mmol/L). Specificity and sensitivity of using plasma lactate concentration (with a cutoff of 6.0 mmol/L) to predict which dogs had gastric necrosis were 88 and 61%, respectively. Sixty-two of 63 (98%) dogs without gastric necrosis survived, compared with 25 of 38 (66%) dogs with gastric necrosis.

Preoperative plasma lactate concentration was a good predictor of gastric necrosis and outcome for dogs with GDV. The prognostic value of plasma lactate concentration may be attributable not only to its association with gastric necrosis, but also to its association with severity of systemic hypoperfusion. Hyperlactatemia develops when the rate of lactate production in ischemic tissue exceeds the rate of lactate metabolism in the body. A high plasma lactate concentration in a dog with GDV may be a result of systemic hypoperfusion or gastric ischemia. Systemic hypoperfusion was likely the most important fact contributing to the high plasma lactate concentration. In the author's experience, the increase in plasma lactate concentration is proportional to the severity of circulatory compromise. -Abstracted from: de Papp, E., et al. JAVMA 215:49-52, 1999. As reported in Vet. Med., Vol. 5, Issue 5, Sept. 1999, Iowa State University, Ames, IA.

Ultraviolet Light

There are two forms of ultraviolet light emanating from the sun; ultraviolet B (UVB) and ultraviolet A (UVA). UVB are the “burning” rays of sunlight which cause sunburn and tanning of human skin, while UVA rays are a major cause of the lines, wrinkles, loss of elasticity, and the brown spots we associate with aging. The UVA rays penetrate window glass and some types of plastics and polymers. They also penetrate the skin more deeply than UVB rays.

Unlike UVB rays, the amount of UVA present in sunlight does not vary significantly from season to season, or with the latitude, altitude, and the time of day.

There is clear evidence that UVA rays are dangerous and damaging to human skin. The FDA is developing new guidelines for labeling sunscreen products so the labels indicate the protection level for both UVB and UVA rays on human skin. The prudent approach is to use a broad spectrum sun block product when outdoors in the sunlight.

Sunbathing is right up there with smoking as a potential health hazard. – KCR, October 1999.

Would You Believe?

Americans own something like 112 million pet dogs and cats, most of which are considered members of the family. Owners display or carry pictures of their pets at home and at work. Recently, two firms started offering their services to obtain and store a pet's DNA so that these beloved pets might be reproduced once these cloning techniques become available. – KCR, November 1999.
Oral Lesions Associated with Orotracheal Mechanical Ventilation

The incidence and clinical progression of oral lesions in a cohort of critically ill patients administrated mechanical ventilation via orotracheal intubation were observed prospectively in the Intensive Care Unit (ICU) of the University of California-Davis Veterinary Medical Teaching Hospital. Oral cavities of these patients were examined within 24 hours of being placed on the ventilator and at least daily thereafter during ventilator therapy. As part of the study protocol, any lesion noted was treated. Twenty-one critically ill canine patients (median age 7 years; range < 1 to 19 years) were observed from January 1, 1995 through August 31, 1995.

90.5% of the observed patients developed oral lesions subsequent to being mechanically ventilated. Erosive and ulcerative mucosal lesions were the most frequently observed (15/43) with the tongue being the most frequently involved oral structure. Most of the observed soft tissue oral lesions appeared secondary to persistently applied pressure from teeth, mouth gags, endotracheal tubes, and other monitoring devices.

Efforts taken to prevent persistently applied trauma, such as periodic position changes of equipment and padding of susceptible structures, appeared effective in preventing oral lesions. There were indications of gastric reflux in 6 patients (28.6%), as evidenced by secretions of the oral cavity with a pH of <6 and containing digested blood. Ulcerative lesions in the subset of patients with gastric reflux seemed to worsen in severity with exposure to the low pH secretions.

Over the course of the study, the ICU nursing staff developed an effective protocol for the care of the oral cavity: treating mucosal erosions and ulcers topically with a dilute chlorhexidine solution (0.05%), removing oral secretions via suction as needed, and padding persistently traumatized tissues with glycerin moistened gauze. – Abstracted from: Fudge, M., et al. J. Vet. Emerg. And Crit. Care, 7, 1997, as printed in Vet. Med., Vol. 4, Issue 2, March 1998. Iowa State University, Ames, IA

Animal Rights Activists Push for the Term “Pet Guardian”

In Defense of Animals (IDA), an animal rights organization based in California, has recently proposed legislation to amend the San Francisco Municipal Code. Led by Dr. Elliot Katz, the group advocates adding the term "pet guardian" wherever the term "owner" is used in the city's animal control laws. Supporters feel that the language makes a moral distinction between someone who buys an animal and someone who adopts one. They see the legislation as a first step toward elevating the status of animals from that of property to that of individuals with rights of their own.

To the many dog owners who share a special, indefinable bond with their animals, this idea may sound appealing. However, the long-term legal implications of designating pets as more than property blurs the legal responsibilities of pet ownership. Under current California law, legal guardianships apply only to minors and do not give appointed guardians the same legal status as parents or owners, both of whom have all the rights necessary to protect their child or pet. As Sharon Coleman of The Animal Council further notes, "The non-legal meaning of guardian is merely one that guards, watches over, or protects, and this meaning is devoid of rights or obligations. Without going further to legally deny property rights in animals, the word ‘guardian’ has no meanings that would inspire greater respect for animals as individuals with feelings, needs and interests of their own” as IDA’s campaign pledge form reads. The IDA pledgor would be the animal’s ‘caretaker, guardian, companion, or friend, rather than their owner or master.’ We only hope that guardians of minors assert more quasi-parental authority over their human wards than is suggested to be appropriate for guardians of non-humans, particularly dogs.”

While not offering animals any tangible benefits, the San Francisco proposal does advance the ideological agenda of animal rights activists to eliminate the property status of animals. Thus owners' rights would no longer have legal protection of any kind. It also opens the door to irresponsible dog ownership by providing no practical definition or model that can be used to manage animals in a safer, more successful manner. At the same time, it wastes tax payers' money for the time and cost required for implementing ordinance changes with no legal meaning. – From AKC Newsletter, Call to Action.

Would You Believe?

A young woman who marries today, in all likelihood, will spend more time caring for her parents than for her children. A young person marrying today will likely have more spouses than children. –KCR, November 1999.
## Opportunities in Continuing Education
### Winter 2000

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<th>Date</th>
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<th>Location</th>
<th>Contact Hours</th>
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<tr>
<td>February 11-12</td>
<td>Practical Eye Surgery</td>
<td>Blacksburg</td>
<td>10</td>
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<tr>
<td>March 3-4</td>
<td>Spinal Surgery</td>
<td>Blacksburg</td>
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<td>April 7-8</td>
<td>Echocardiography</td>
<td>Blacksburg</td>
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<td>April 21-22</td>
<td>Thoracic Radiology</td>
<td>Blacksburg</td>
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<tr>
<td>March—September</td>
<td>Head &amp; Neck Surgery/Dentistry Series</td>
<td>Blacksburg</td>
<td>40*</td>
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*This course meets at the College in Blacksburg one Friday each month for a total of 40 contact hours.

**Please Note:** The courses listed above are limited enrollment and feature a hands-on laboratory experience under the guidance of clinical faculty members. Program brochures provide course details. For registration or more information, please contact: Dr. J.M. Bowen, VMRCVM – Virginia Tech, Blacksburg, VA 24061, (540) 231-7388; or Conference Registration, Continuing Education Center, (540) 231-5182.

## Plant Threats to Animals Detailed in New Digital Outreach Program

Thanks to a new digitally based outreach program developed by a professor in the Virginia-Maryland Regional College of Veterinary Medicine, Extension specialists, farmers, pet-owners, and veterinarians can obtain instant information on almost 30 species of toxic plants which threaten livestock and pets in the Mid-Atlantic area.

"The Prevention of Plant Poisonings in Livestock & Pets Program" has been created on CD-ROM and the World-Wide Web by Blair Meldrum, a toxicologist in the college's Department of Biomedical Sciences and Pathobiology and Vicky Kok, veterinary college librarian and honors botanist.

The goal of the program is to help veterinarians, Extension agents, producer groups, and other advisory groups learn more about how they can play a role in educating the general public about plants that can threaten the health of their animals.

Grasses, flowers, and aquatic plants provide nourishment for animals and add beauty to the countryside. But some of those plants can cause serious problems for animals.

Red Maple, Water Hemlock, Wild Cherry, and others contain toxins that can cause neurological, gastrointestinal, and reproductive disorders in livestock. Others, such as Christmas-season plants like Poinsettia, Mistletoe, and others raise concerns for pet owners.

Many people have become somewhat aware of the health threats posed by some plants through folklore and periodic scientific and Extension bulletins. But up until now, Meldrum said, that information has been fragmented and not always current.

The web-accessed digital database and CD-ROM are structured in a concise, "user-friendly" format that contains detailed color pictures of common poisonous plants seen in Virginia and Maryland. It details the features of each plant, refers to the most toxic parts, the conditions under which poisonings are most likely to occur and outlines the nature of the toxin and the disease process triggered by ingestion.

"Our goal is prevention," said Meldrum, who embarked upon the project after serving for 11 years as Associate Dean for Academic Affairs in the college. "By making this information available, we can help producers manage their pastures and their animals in a way that prevents the problems from occurring."

The web site and CD-ROM have organized the toxic plants into the 15-20 that commonly affect farm animals like cattle, horses, sheep, goats, llamas, pigs, and the dozen or so that are troublesome for companion animals like dogs and cats.

The CD-ROM has been distributed free of charge to all Extension Offices throughout the state. Veterinary hospitals and clinics, other agencies, and members of the general public are welcome to purchase the CD for a nominal fee. For more information about the new program, contact Meldrum at (540) 231-4587. – from Jeffrey Douglas, *Spectrum*, Fall, 1999. Virginia Tech, Blacksburg, VA. Reprinted with permission.
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