VIRGINIA-MARYLAND VETERINARY NOTES

Veterinary Teaching Hospital, Virginia-Maryland Regional College of Veterinary Medicine

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WHAT'S INSIDE!

Thought of the Month

True Wealth is about accepting, loving and enjoying life.

VirginiaTech
Invent the Future

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

Lawn and Garden Products

During the summer months, pets may be exposed to a number of products used on the lawn, garden or flower beds. These products range from relatively innocuous to highly toxic. Classes of outdoor compounds include fungicides, herbicides, insecticides and fertilizers.

Fungicides: Fungicides, if they have been properly diluted for spraying, are usually of little consequence in dogs or cats that might be exposed to foliage that was sprayed. Dogs that may get into a non-diluted product would be at most risk of a toxicosis. Some of the more commonly used fungicides include captan, tebuconazole, triforine, myclobutanil, fenbutatin-oxide and chlorothalonil. Lethal doses of these fungicides measured in rats after oral dosing are all in the gram/kg range

Herbicides: Like fungicides, herbicides that have been properly diluted are usually of little consequence for animals that are exposed. Most are poorly absorbed dermally, so an animal that walks through a recent lawn application receives very little exposure. The most common class of lawn herbicides is the phenoxyacetic acid derivatives used to kill broad-leaf weeds (e.g. dandelions). These broad-leaf herbicides include 2,4-D, MCPP, MCPA, and a closely related one, dicamba. Exposure of dogs to non-diluted products or puddles of diluted products can cause neuromuscular and GI problems. Skeletal muscle has a disruption of the sarcolemma resulting in rear leg paresis problems from myotonia. Myotonia is represented by a very rigid skeletal muscle tone in the rear legs. Treatment is based on clinical signs. The second most common herbicide used around the home is glyphosate (RoundUp®). It is a glycine amino acid derivative that is fairly nontoxic. The surfactant carrier in the product is more toxic than glyphosate and exposure of dogs to undiluted product or puddles of diluted product has been associated with GI problems. Treatment is based on clinical signs. Exposure of pets to foliage that has been properly sprayed with glyphosate should be of little consequence.

Insecticides: Various classes of insecticides are available for lawn, garden or flower treatments. Lawn insecticides are often used to kill white grubs. In the past, many of these products were granular organophosphate (OP) insecticides, which were highly toxic for birds. Currently, other classes of insecticides are being marketed for grub control. Biological insecticides [*Bacillus thurigiensis* (Bt) and *Bacillus popilliae*], imidacloprid and halofenozide are now used to kill white grubs. These insecticides are relatively nontoxic and have not caused significant problems for pets or wild birds. Insecticides sprayed on gardens or flowers include disulfoton, acephate and pyerethroid insecticides. Disulfoton is a highly toxic OP insecticide and can cause both acute and intermediate OP toxicoses in dogs or cats. Lambda-cyhalothrin and permethrin are two of the more common turf pyrethroid insecticides. Permethrin is the most common pyrethroid toxicosis in cats. A permethrin toxicosis in a cat may progress from depression and muscle tremors to clonic-tonic convulsions. These convulsions caused by permethrin in cats are best treated with methocarbamol. Lambda-cyhalothrin toxicoses in pets are not well documented, but it is approximately 10 fold more toxic for rats than permethrin. Most pyrethroids are highly toxic for fish, aquatic invertebrates and honey bees.

Fertilizers: Most N-P-K based fertilizers cause only minor GI problems in dogs. However, rose fertilizers may be very toxic because of their iron content (5%). Approximately 1 g/kg b.w. oral exposure of dogs to rose fertilizers can cause an iron toxicosis with initial GI problems followed by cardiovascular collapse and severe liver necrosis. Deferoxamine (Desferal®) is the chelator of choice for iron.

Dennis Blodgett, D.V.M., Ph.D., Diplomate, A.B.V.T., Toxicology, Virginia-Maryland Regional College of Veterinary Medicine, Va. Tech, Blacksburg, VA

Saliva: A Window to Health Status

Spitting in public is socially frowned on, unless, for example, you're sitting in the dentist's chair. Now, you can also spit in the name of science.

That's what's being asked of a fit, 30-something-year-old male volunteer taking part in a 4-year research project called "salivary proteomics cataloging."

Scientists from the Agricultural Research Service, the University of Rochester, and Scripps Research Institute are involved in cataloging the thousands of proteins, lipids, sugars, and other molecules that make up human saliva.

The project dovetails with growing interest in using salivary proteins as a way of diagnosing diseases or detecting illegal-drug use.

ARS chemist Neil Price is researching saliva as a potential biochemical window on the body's anabolic workings chemical means by which nutrients in food are assembled into larger molecules for growth.

"Saliva is a really good diagnostic medium because it's noninvasive and has a fast turnover; you're making salivary proteins all the time," says Price, who is with ARS's National Center for Agricultural Utilization Research, in Peoria, Illinois.

In an approach called "nutritional diagnostics," saliva could also be used to evaluate how an individual's metabolism responds to a particular food or supplement. Either could be adjusted accordingly to improve health.

Of particular interest is measuring the rate at which the body metabolizes fructose, glucose, and other simple sugars in food and parcels them out as building blocks for salivary components, especially mucins and other glycoproteins. Price and ARS chemist Suzie Sheng are using massspectrometry analysis to compare the ratio of carbon 12 and 13 isotopes of sugars that have been metabolized and secreted into saliva.

"We aim to develop a model for how metabolism changes in response to exercise, dieting, or dietary supplements," says Price. "If we know what happens in a healthy individual, and how that can change, then we might be able to explain what it means to 'feel healthy' in a measurable way."

Such information could also prove useful in assessing changes in health brought on by use of "prebiotics"—carbohydrates that nourish growth of beneficial gut bacteria. Price and colleagues envision being able to count populations of good microbes based on the metabolism of oligosaccharides—sugars from corn and other crops that are linked to bacterial growth and activity in the colon. This research is in keeping with the ARS center's goal of expanding markets for corn, soybeans, and other crops.

"We hope this will lead to improved food products for human health and, ultimately, create new markets for agriculture-based carbohydrates," says Price.—By Jan Suszkiw, ARS.

This research is part of Quality and Utilization of Agricultural Products, an ARS National Program (#306) described on the World Wide Web at www.nps.ars.usda.gov.

Neil Price is in the USDA-ARS Bioproducts and Biocatalysis Research Unit, National Center for Agricultural Utilization Research, 1815 N. University St., Peoria, IL 61604, as reported in Agricultural Research, May 2006, United States Department of Agriculture

Dutch Elm Disease Update

The fungus that causes Dutch elm disease (DED) accidentally rode into the United States on elm logs shipped from France to Cleveland, Ohio, in 1931. By the 1980s, the destructive fungus—*Ophiostoma ulmi*—had wiped out around 77 million American elms.

To combat this exotic and deadly disease, researchers screened thousands of American elm trees for DED resistance. Thanks to diligent care, enough old specimens were located and kept alive to provide the germplasm necessary to develop DED-tolerant trees. Much of this work was done by Agricultural Research Service (ARS) scientists with the U.S. National Arboretum in Washington, D.C.

The arboretum's tree-breeding project was led, until his 2005 retirement, by geneticist Denny Townsend, who worked with horticulturalist Susan Bentz, in the ARS Floral and Nursery Plants Research Unit (FNPRU) at Glenn Dale, Maryland.

In 2005, the newest American elm—named "Jefferson"—was released jointly by ARS and the National Park Service (NPS), after collaborative screening tests by Townsend and NPS plant pathologist James L. Sherald showed it to have an outstanding level of DED tolerance. It was cloned in 1993 from the original tree, a survivor of about 600 elms planted on the National Mall in Southwest Washington in the 1930s. Jefferson was thought to be a hybrid elm until DNA test performed at the arboretum proved it to be a true American elm—*Ulmus americana*—a relief to purists.

This sturdy elm grows in the typical vase shape up to 68 feet tall. Its leaves turn dark green earlier in spring and stay dark later in fall than most other elms. Jefferson has broad U-shaped branch unions—rather than narrow V-shaped ones—has attractive bark, and can be propagated by softwood cuttings. FNPRU research leader John Hammond regards Jefferson as a good street tree because it can withstand pollution from city traffic and has wide adaptability, growing in USDA plant hardiness zones 5 through 7.

While this durable, DED-tolerant elm may once again fill our parks and grace street sides with true American elms, Jefferson won't be available to consumers for about 4 years. But specimens can be seen on the National Mall, next to the old Smithsonian Building, and soon at the arboretum, and efforts are under way to propagate quantities for nursery cooperators. Two other DED tolerant elms developed through ARS tree breeding, Valley Forge and New Harmony, are already in wide use.

Alfredo Flores, ARS

This research is part of Plant, Microbial, and Insect Genetic Resources, Genomics, and Genetic Improvement, an ARS National Program (#301) described on the World Wide Web at www.nps.ars.usda, as reported in Agricultural Research, June 2006, United States Department of Agriculture

Would You Believe?

Investor inertia regarding stock market investing often produces higher returns than investor alertness and quick trading. Studies at the University of California found that the more actively investors trade, the less they earn. The most active had an average return of 5.5% less than the least active.

Generic drugs account for 56% of all prescriptions filled. It takes the FDA about twice as long (16_ months) to review a generic drug as to approve a brand new brand – name drug.

Too Many Carbs May Spoil Eyesight

A look at the eye health of 417 women aged 53 to 73 and with no history of cataracts seems to link high dietary carbohydrate intake to development of eye lens opacity, or cataract. About 20 million Americans older than 40 develop cataracts—the leading cause of blindness worldwide. The analysis was part of the Nutrition and Vision Project, a substudy of the federally funded Nurses' Health Study, in which the volunteers are participants.

The researchers conducted eye exams and studied dietary intake data from questionnaires designed to assess the possible relationship between volunteers' newly diagnosed cataracts and their average carbohydrate intake over a 14-year period. Those women whose average carbohydrate levels were between 200 and 268 grams (g) per day were 2.5 times more likely to develop cortical cataracts than those whose intakes averaged between 101 and 185gperday.Thecurrent recommended dietary allowance, based on how much glucose the brain needs, is 130 g for both adults and children.

Allen Taylor, USDA-ARS Laboratory for Nutrition and Vision Research, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts, as reported in Agricultural Research, February 2006, United States Department of Agriculture

Employee Incentives

One way of increasing practice income, improving employee morale and reducing employee turnover is by the effective use of incentives. Rewarding productive employee behavior makes good sense that should translate into better "bottom line" results.

Incentives are based on accepted behavioral science and are capable of generating enthusiasm among employees when well planned and executed. Some form of profit sharing is the most common incentive used in business, and it makes a great deal of sense having employees as "partners" in any business. Benefits must be directly related to employee input and effort. Reducing the chance of "disincentives" is an important consideration in deciding on a plan. Well conceived plans also offer employee recognition which is critical to any successful business. Rewarding above average achievement quickly is very important. Waiting for months to receive recognition or incentive reward makes the program considerably less effective.

Other considerations that help make an incentive program successful are: frequent reminders of the program rewards, a choice of rewards reflecting different tastes, very specific goals and rules for the program, updating the program regularly, and finally, make sure that management is "onboard" and committed to making the incentives work.

Incentives programs are available on line and through practice consultants.

Kent Roberts, DVM
Blacksburg, VA

Aging Populations

A country's population aging is driven more by birth rates rather than by longer life spans. The momentum for population aging is building world wide with China by far the most impressive. Between 2005 and 2025, about two thirds of China's population growth will occur in the 65 and older group. This will account for about 200 million Chinese.

Sub-Saharan Africa is a notable exception as the median age will likely remain at about 20 years for some time. Many areas of the Middle East still have fertility levels at or exceeding five births per woman per lifetime. However, much of the world is in a stage of sub-replacement fertility.

Laser Lithotripsy For Removal Of Uroliths In Dogs

ABSTRACT
Introduction: This study evaluated the ability to fragment and remove naturally occurring uroliths in dogs using a holmium: YAG laser.

Methods: Twenty four dogs with naturally occurring uroliths including 10 spayed females and 14 neutered males. The dogs were 8.7 + 2.8 years old and weighed 13.7 + 8.0 kg. All dogs had bladder stones and 5 male dogs also had urethral stones. In female dogs, cystoscopy was performed using a rigid cystoscope with sheath diameter of 14 to 19 french. Cystoscopy was performed in males dogs using a 7.5 french diameter pediatric ureteroscope. Uroliths were fragmented using a 20 watt Holmium: YAG laser and the fragments were removed by basket extraction and voiding urohydropropulsion.

Results: Average laser parameters for urolith fragmentation were 0.7 Joules at 8 Hertz (range: 0.5 to 1.3 Joules at 5 to 13 Hertz). All urolith fragments were successfully removed in all 10 female dogs and 11 of 14 male dogs. In one male dog, the urethra was too small to allow passage of the ureteroscope. In one of the male dogs, the urethral stones were successfully removed by laser lithotripsy, but removal of the bladder stones was performed by cystotomy. There was one complication of urethral perforation during attempts to pass an access sheath transurethrally in a dog with extensive proliferative urethritis.

Conclusions: Laser lithotripsy is a safe and effective method of removing bladder and urethral stones in dogs provided the dog is large enough to permit transurethral passage of a cystoscope or ureteroscope.

Keywords: uroliths, lithotripsy, canine, Holmium: YAG

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Funded Clinical Research Study of Laser Lithotripsy of Canine Uroliths

Dear Referring Veterinarians,

I am excited to inform you that as of July 1st, 2006 I will begin a clinical study to evaluate the efficacy, efficiency, and complications of **endoscopic laser lithotripsy** for the non-surgical removal of bladder and urethral stones in dogs. Although reports of the procedure in dogs are few, experience at the VTH and other centers has been very positive. **The cost to the client will be only $200-300 for the first 20 clients, with the study paying for the remaining $600!**

Please contact me directly at 540-231-4621 or dgrant@vt.edu if you have any questions or have a patient and client that you feel may benefit from lithotripsy. Thank you for your continuing support of our research program through the referral process.

Sincerely,
David Grant, DVM, MS
Diplomate ACVIM (Internal Medicine)
Assistant Professor, VMRCVM

Small Turtles Can Cause Illness, FDA Tells Consumers

In July, the FDA issued an; Alert to Parents" telling them, as well as all consumers, that turtles are frequently contaminated with *Salmonella* bacteria and can pass the bacteria to anyone handling the turtles, making them sick. Children are especially susceptible.

FDA issued the alert because it has received reports that parents buy baby turtles as pets for their children.

Turtles naturally carry *Salmonella* bacteria. When they shed it, anyone handling the turtles can become infected. *Salmonella* bacteria cause salmonellosis in humans, an infection of the digestive tract. Symptoms include nausea, diarrhea, stomach pain, vomiting, fever, and headache.

Anyone can become infected, but the risk is higher in children, as well as the elderly and individuals with lowered immunity.

The turtles themselves are not affected by *Salmonella*. Infected turtles may not shed it all the time, so a negative test does not indicate a turtle is free of the bacteria.

To protect the public health, FDA enforces a regulation that prohibits the sale of turtles with shells 4 inches long or smaller as pets. The regulation has been in effect since 1975. Anyone convicted of selling the baby turtles can be fined up to $1,000 and sentenced to jail for up to a year for each offense.

Reported in North Dakota State University Vet Notes, First Quarter, 2006, Fargo, ND

Continuing Education Opportunities

Date	Topic	Location	Contact Hours
August 26, 2006	Radiography for Technicians	Blacksburg	7
October 6 & 7, 2006	Applied Ultrasonography	Blacksburg	10
October 13 & 14, 2006	Introductory Echocardiography	Blacksburg	10
November 17, 18 & 19, 2006	Advanced Echocardiography	Blacksburg	21
TBA	3 – Day Gastrointestinal Endoscopy	Blacksburg	24
TBA	3-Day Soft Tissue Surgery	Blacksburg	24

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 more information, please contact Anne Cinsavich, aclapsad@vt.edu (540) 231-5261; or to register for a program, please contact Conference Registration, Continuing Education Center, (540) 231-5182.

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