



Home, Hazardous Home

When 16th-century alchemist Paracelus came up with the maxim, “the dose makes the poison,” the father of modern toxicology definitely knew what he was talking about — especially when it comes to animals and their eating habits.

In many homes, our pets often follow the dubious mottos of “more is better” and “because it’s there” as they find new and potentially dangerous foods and products to put in their mouths. While some products are well known for their potential risk to pets as well as to humans, others that are safe for humans can be deadly for dogs, cats, birds and other animals.

It’s the latter group of products that are the most treacherous since they can be found in almost every household and their possible threat to animals’ health can go unrecognized by pet owners. That’s why it’s so important for pet owners to be able to identify potentially hazardous foods, plants and other products. It’s also crucial for owners to recognize the symptoms of poisoning, and to know what to do if your pet does get into something harmful.

To give you some guidance, three WCVM specialists — Drs. Mark Wickstrom, Jennifer Ogeer and Dennilyn Parker — spoke to writer Roberta Pattison about what makes some common foods and products harmful to your pets, the common clinical signs to watch for, and the therapies that veterinarians use to counteract the toxic effects of these products.

What’s in your home that’s hazardous to your pet’s health?

By Roberta Pattison

Antifreeze (ethylene glycol)

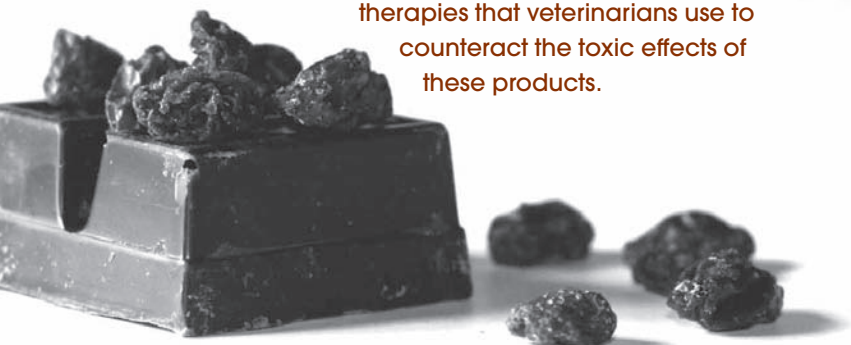
The sweet taste of antifreeze makes it attractive to most animals, and a spill on the garage floor from a car’s leaking radiator may go unnoticed until it’s too late. The minimum lethal dose of ethylene glycol is one to two millilitres per kilogram in cats (6.0-7.0 ml/kg in dogs). In other words, about two teaspoons of antifreeze can cause death in an average-sized cat, and even the less toxic, diluted antifreeze is still very dangerous.

In antifreeze poisoning cases, treatment must be instituted quickly if it’s to be effective. A sweet odour to a pet’s breath with nausea and vomiting are often the first symptoms, and the animal might act drunk or unco-ordinated. Within a few hours, your pet may be depressed, drooling, trembling and unable to stand. The longer treatment is delayed, the less hopeful is the prognosis.

The toxic substance is not the antifreeze itself but a metabolite which combines with calcium in the bloodstream, forming crystals that damage the tubules in the kidneys — leading to acute kidney failure. The goal of treatment is to prevent the metabolism of the antifreeze and formation of these crystals in the tubules of the kidneys. This is accomplished by administering fomepizole (4-methylpyrazole) or intravenous ethanol for several days.

Chocolate

Chocolate is no more than a guilty (and fattening) indulgence for most of us, but it’s poisonous to dogs that metabolize it differently to humans after ingestion. An ounce of milk chocolate per pound of dog is potentially lethal, while dark chocolate is twice as powerful. The most deadly type is unsweetened baker’s chocolate that is 10 times more potent than the chocolate used in a regular candy bar.



POISONED PETS

Expert Tips on What You Can Do

The primary toxic agent in chocolate is *theobromine*, a cardiovascular and central nervous system stimulant. In the initial four to six hours after ingestion, the first signs of acute toxicity in a pet are vomiting, diarrhea, restlessness, excessive drinking and urinating. Over the next few hours, clinical signs escalate to include increased hyper-excitability, muscle tremors and seizures, elevated body temperature, increased heart rate and an abnormal heart rhythm. Death occurs within 18 hours to several days, resulting from cardiac and respiratory failure. Lower doses of chocolate sometimes induce gastrointestinal upset or pancreatitis consistent with a dog eating a very high fat meal.

Pets manifesting clinical signs from chocolate toxicity require hospitalization, treatment for seizures and monitoring cardiac and respiratory function for at least a couple of days because the half-life of theobromine in the body is approximately 15 to 20 hours. A first step in treatment is to minimize absorption by inducing vomiting, but veterinarians may also give repeated doses of activated charcoal. Theobromine is metabolized in the liver and excreted in the bile, but it can be taken back up into the body if activated charcoal isn't administered to prevent reabsorption in the gut.

Grapes and raisins

Grapes and raisins seem more unlikely than chocolate to be poisonous to pets, but it has now been documented that some dogs are highly susceptible to the toxic agent they contain. This toxic agent and the exact mechanism of action have yet to be identified, but an ochratoxin found in grapes has been suggested as one possibility.

The toxic dose varies considerably. On average, a half-pound of grapes is dangerous for a medium-sized dog (i.e. 10 to 30 grams per kilogram), but death can occur with ingestion of a much smaller quantity. Acute kidney failure is the most serious effect and can be fatal depending on the quantity of grapes or raisins ingested as well as the delay in initiating treatment.

Immediate treatment can improve the chances of survival, so it's important to recognize the clinical signs of poisoning. These signs include vomiting and diarrhea, loss of appetite, depression and abdominal pain. Damage to the tubules in the kidneys may occur within 24 hours to several days, leading to signs of acute kidney failure with decreased or no urine output.

The first step in treatment is to induce vomiting, often followed by gastric lavage and the administration of an absorbent such as activated charcoal. In addition, veterinarians will provide two to three days of fluid therapy to protect the dog's kidneys and to enhance toxin excretion.

Xylitol

Xylitol is a popular artificial sweetener found in sugarless gums as well as baked goods, beverages, toothpaste and cereals. While it's harmless to humans, the artificial sweetener produces a massive release of insulin in dogs. Insulin release leads to a dramatic lowering of the animal's blood

Continued on page 14

- Identify the source of your pet's poisoning. If it is pills, plants or even garbage, take samples with you to show to your veterinarian.
- Induce vomiting only if the ingested substance is not caustic and your pet is still alert. Give one to two millilitres per kilogram (ml/kg) of 3.0 per cent solution hydrogen peroxide by mouth. Repeat once if necessary, but do not give more than a total of 10 ml.
- Do not induce vomiting if the substance ingested is caustic, or if your pet is showing neurological signs such as depression or seizures. Additionally, do not induce vomiting if your pet has epilepsy or has had recent surgery (especially abdominal surgery).
- If your pet has eaten any substance containing the artificial sweetener xylitol, rub honey or corn syrup on the gums immediately.
- After ingestion of a toxic substance or during transportation, position your pet on its abdomen (not on its side) with its head elevated on a pillow. If your pet starts to vomit, lower its head. If your pet is seizing, do not put your hand in its mouth.
- If your pet becomes too warm from muscle tremors or seizures, do not cool the animal down too quickly by immersion in cold water or direct application of ice: this can lead to shock. It's best to use cool towels or frozen veggie bags on your pet's groin or axillary region.
- Transport your pet to your veterinarian or local veterinary clinic as soon as possible, and ask someone to travel with you in the vehicle. Veterinarians have better products on hand to induce vomiting as well as activated charcoal to absorb toxins, various antidotes and other supportive treatment for your pet.
- Give your veterinarian as much information as possible and report everything that you have done so far. When you're estimating the amount of toxic substance ingested, assume the worst-case scenario.
- If your pet has had topical contact with a toxic product, bathe the animal thoroughly and dry well. Use mild liquid detergent. Various commercial products are also available, but make sure to read the label first: some products are safe for dogs but not for cats.
- Keep an antihistamine (such as Benadryl®) on hand. It's safe for dogs and cats at a dose of two milligrams per kilogram (mg/kg), and it's useful for insect stings or any other type of allergic reaction that's manifested as facial swelling or hives.
- Prevention is always the best cure. Know what products are harmful and keep all potentially poisonous substances and plants out of your pets' reach.

For more information on common toxic plants and other products that are dangerous to your pets, visit the American SPCA web site (www.aspc.org) and click on "Animal Poison Control" in the menu bar. The National Animal Poison Control Center Hotline (1-888-426-4435) also offers emergency advice: you may be charged a \$60 consultation fee (this can be paid by credit card).



Home Hazardous Home *cont'd*

sugar levels within a half-hour to an hour after ingesting xylitol. Clinical signs include vomiting, weakness, depression, inco-ordination and even seizures. Ingestion of quantities of xylitol greater than 0.1 grams per kilogram can induce hypoglycemic symptoms. Doses of 0.5 gm/kg and higher may cause serious liver damage and subsequently lead to liver failure.

No data is available for cats or other small pets. Given the average dog's sweet tooth, it's not surprising that they are prime candidates for xylitol poisoning, and dogs have died after eating as few as half a dozen cookies or several sticks of gum. Treatment involves administration of intravenous glucose or dextrose and monitoring blood glucose regularly for 12 to 24 hours. Because severe clinical signs often develop rapidly, veterinarians don't advise owners to induce vomiting after any symptoms of xylitol toxicity appear.

Over-the-counter and prescription medications

Common medications, especially painkillers such as acetylsalicylic acid (ASA or Aspirin®), acetaminophen (Tylenol®) and ibuprofen can cause serious problems for our pets. However, cases of toxic overdose of these drugs aren't usually due to accidental ingestion: problems often occur when owners administer these drugs inadvertently to treat ailments such as arthritis in their pets.

Dogs metabolize all three of these common painkillers much more slowly than humans, and toxic doses of acetaminophen and ibuprofen for dogs are very close to therapeutic doses for humans. Cats are even more susceptible than dogs to the toxic effects of all three drugs.

The clinical signs can range from difficulty breathing in cats given acetaminophen, to lethargy, vomiting and depression caused by gastric ulcers or kidney failure in dogs overdosed with ibuprofen. Treatment at home involves inducing vomiting within two hours of ingestion of the drugs. However, if a longer period of time has elapsed or the amount ingested is potentially significant, the pet must be seen by a veterinarian to have proper, specific therapy instituted immediately.

Houseplants and garden plants

Plant toxicities are challenging to treat as it's often unknown what plant has been ingested. Veterinarians often begin symptomatic treatment without knowing the exact toxic agent involved. Concentrations of the toxic agents found in plants are widely variable, and may depend on the growing season, the parts of the plant ingested (including whether the leaves are young or old), the plant variety and its habitat.

An increasing number of homeowners are decorating their houses and gardens with a variety of exotic plants from around the world. While these plants may be beautiful, some of them are extremely toxic to pets and little information on clinical effects and treatment may be available.

Many plants such as poinsettias are simply digestive tract irritants. If they are ingested by pets, they can cause abdominal pain, vomiting or diarrhea and no further serious side effects. Other plants can be more dangerous. For example, lilies are extremely toxic to cats. Even when small amounts of the leaves and flowers are ingested, life-threatening acute renal failure may occur. Another potential danger is the avocado plant that can be highly toxic to birds, rabbits and to pocket pets.

Onions and garlic

Onions, garlic and chives can be dangerous to your pets — especially cats. Toxic amounts

are estimated at about five grams of dehydrated onions per kilogram, and even an ounce of cooked onion can be potentially poisonous to your cat. Dogs are five to six times less sensitive to the toxic effects of onions, garlic and chives.

The toxic agents in onions and garlic are organosulfoxide compounds. These toxins are believed to cause oxidative damage to the red blood cells and denature haemoglobin so oxygen is carried less efficiently in the body. Red blood cells become fragile and break down, resulting in anemia. A complicating factor in the diagnosis is that there's a long lag time (several days) before pets demonstrate the clinical signs of toxicity. These signs include inappetence, abdominal pain, depression, red urine, elevated heart rate and rapid breathing. Treatment includes administration of oxygen and blood transfusions.

Toxic products for pet birds

These days, pet birds are often allowed to fly free in the home instead of spending all of their time in cages. That practice, coupled with birds' curious natures and their propensity to pick at things with their beaks, puts them at an increased risk of poisoning. For example, a hanging plant that's toxic for pets can be out of your dog's reach — but serves as a handy perch for your bird.

That being said, birds are most often poisoned when they eat **old birdseed** that may contain toxic moulds. They can also be victims of **lead toxicity**: paint containing lead, the lead used in stained glass, and curtain and ceiling fan weights are the most common sources of lead poisonings. Another potential danger for birds originates from **Teflon®** coated cooking ware. When these pots and pans are overheated, the Teflon® coating emits a poisonous gas that affects birds' lungs — usually fatally. Birds provide a particular challenge for veterinarians because they seldom look sick until they are very sick. At that point, it's often too late. **V**

About our WCVM Experts

Associate professor **Dr. Mark Wickstrom**, BSc, MSc, DVM, PhD, is a veterinary and wildlife toxicologist in the college's Department of Veterinary Biomedical Sciences. He has two decades of experience in identifying and investigating the effects of natural toxins, pesticides, metals and oil field emissions on animals' health.

Associate professor **Dr. Jennifer Ogeer**, BS (Hons), DVM, MSc, is a specialist in emergency and critical care for companion animals while assistant professor **Dr. Dennilyn Parker**, DVM, MVetSc (Diplomate, ABVP — Avian), specializes in avian, exotic and wildlife medicine. Both clinicians, who are part of WCVM's Department of Small Animal Clinical Sciences, have a wide range of experience in diagnosing and treating cases of animals that are suffering from the effects of toxic poisoning.

Roberta Pattison is a freelance writer who is a regular contributor to the national publication, *Dogs in Canada*. Recently retired from grain farming, she still lives on her farm near Delisle, Saskatchewan.

