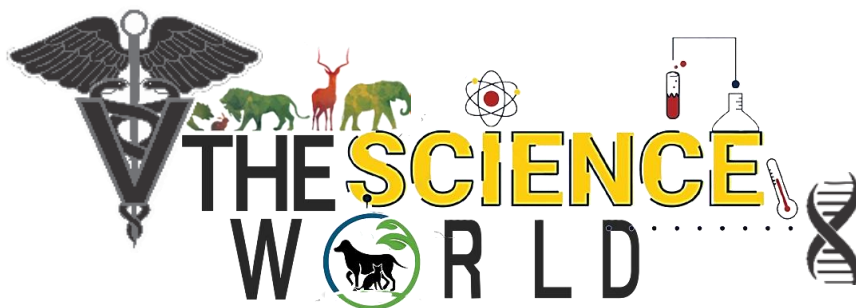




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Domestic Toxic Hazards for Companion Animals: Foods, Plants, and Household Products

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Introduction

Annually, animal poison control centres receive a substantial number of inquiries concerning toxic exposures in pets, with the ASPCA Animal Poison Control Centre reporting over 451,000 cases in 2024 alone, a number that continues to increase each year. Food and drink items constitute the second most prevalent category of exposure, accounting for approximately one in six calls. These incidents predominantly occur in domestic environments during routine activities such as cooking, baking, or sharing food with pets. Dogs and cats have distinct metabolic pathways and organ sensitivities, making many common foods and household products toxicologically hazardous. This review synthesizes the most frequently encountered household and food toxins in small-animal practice, detailing their mechanisms of toxicity and clinical management.

General First Aid Principles

Several principles are applicable across most toxicoses. Owners should consult a veterinarian or poison control hotline before initiating home treatment. Inducing emesis is contraindicated in animals exhibiting neurological signs, following ingestion of corrosive substances, or after exposure to petroleum products due to the risk of aspiration. When advised, fresh 3% hydrogen peroxide (1 teaspoon per 5 pounds of body weight) is the only acceptable over-the-counter emetic for dogs, administered once only. Preservation of evidence and prompt



veterinary evaluation are crucial, as several toxins can cause irreversible organ damage before clinical signs appear.

Chocolate Toxicosis

Chocolate poisoning remains one of the most frequent veterinary emergencies. Methylxanthines, primarily theobromine and caffeine, stimulate the central nervous and cardiovascular systems. Dogs metabolize theobromine slowly, prolonging its toxic effects. Baking and dark chocolate contain significantly higher theobromine concentrations than milk chocolate, while white chocolate poses minimal risk. Clinical signs manifest at approximately 20 mg/kg, cardiovascular effects at 40 mg/kg, tremors or seizures above 60 mg/kg, with fatalities likely at 100–200 mg/kg. Symptoms include vomiting, restlessness, tachycardia, tremors, and seizures, typically appearing within hours and persisting for a day or more due to theobromine's extended half-life.

Xylitol Toxicosis

Xylitol, a sugar alcohol present in sugar-free products, is harmless to humans but extremely dangerous to dogs. In dogs, xylitol induces rapid insulin release, leading to hypoglycaemia within 30–60 minutes. At higher doses, it can cause acute hepatic necrosis through poorly understood mechanisms. Doses exceeding 100 mg/kg are associated with hypoglycaemia, while doses above 500 mg/kg pose a substantial risk of liver injury. Cats appear resistant to xylitol toxicity. Due to the rapid onset, immediate veterinary care is critical.

Grape and Raisin Toxicosis

Tartaric acid has been identified as the probable toxic agent in grapes, raisins, and tamarinds. Dogs exhibit insufficient expression of a renal transporter for organic acids, leading to tartaric acid accumulation in renal tubular cells. Clinical manifestations include vomiting, progressive azotaemia, and potential anuric renal failure. Due to the variable tartaric acid content, no safe threshold has been established; thus, all exposures necessitate emergency intervention with decontamination and intravenous fluids for a minimum of 48 hours.

Allium Toxicosis

Onions, garlic, leeks, shallots, and chives contain organosulfur compounds that oxidize red blood cell membranes, resulting in Heinz body formation and membrane eccentricities. This leads to haemolytic anemia characterized by weakness, pale gums, jaundice, and collapse several days post-ingestion. Cats exhibit greater sensitivity than dogs, with toxicosis documented following ingestion of less than one teaspoon of cooked onion. Concentrated forms, such as powders and dehydrated flakes, pose particular hazards. Heinz body formation occurs within 24 hours, although clinical anemia may be delayed.



Lily Toxicosis in Cats

True lilies (*Lilium*) and daylilies (*Heimerocallis*) induce fatal kidney failure in cats upon ingestion of any plant part, including pollen or vase water. The nephrotoxin remains unidentified. Early symptoms (2–24 hours) include vomiting, lethargy, and anorexia, followed by progressive acute kidney injury with oliguria or anuria within 24–72 hours. No specific diagnostic test exists; diagnosis relies on exposure history and clinical findings. Peace lilies and calla lilies are not true lilies and cause only oral irritation.

Macadamia Nut Toxicosis

The mechanism underlying macadamia nut toxicity in dogs is unknown. Affected dogs exhibit hind limb weakness, vomiting, tremors, hyperthermia, and depression within 12 hours of ingestion. Symptoms typically resolve within 24–48 hours without mortality. Co-ingestion with chocolate, raisins, or xylitol in baked goods necessitates evaluation for multiple toxicoses.

Ethylene Glycol Toxicosis

Ethylene glycol, the primary component of antifreeze, possesses a sweet taste appealing to pets. As little as one tablespoon can induce severe kidney failure in dogs, while approximately one teaspoon is lethal to cats. Metabolism produces toxic acid byproducts that form calcium oxalate crystals, damaging proximal tubules. Poisoning progresses through an acute neurological phase, a deceptive improvement period, and subsequent renal failure. Antidotes (fomepizole or ethanol) must be administered within 8 hours in dogs and 3 hours in cats. The time-to-treatment is the critical prognostic factor.

Rodenticide Toxicosis

Anticoagulant rodenticides (brodifacoum, bromadiolone, diphacinone) inhibit vitamin K recycling, causing internal bleeding days after ingestion; vitamin K1 serves as an effective antidote. Bromethalin is a neurotoxic rodenticide causing cerebral edema without an antidote; prognosis is guarded once neurological signs appear (Pet Poison Helpline, 2012). Cholecalciferol baits induce dangerous hypercalcemia. Identifying the specific active ingredient is essential for appropriate treatment.

Prevention

Prevention is more effective than treatment. Secure storage of toxic foods, maintaining lily-free households, securing antifreeze and rodenticides, and monitoring human food exposure can prevent most emergencies. When exposure occurs, early veterinary intervention during the narrow treatment window significantly improves outcomes.



Conclusion

Common household foods and products pose significant toxicological risks to companion animals, often with narrow treatment windows. Prevention through secure storage and awareness of hazardous ingredients is far more effective than treatment. When exposure occurs, prompt recognition and immediate veterinary intervention are essential to optimize outcomes. Ultimately, owner education and vigilance remain the cornerstone of protecting pets from these preventable poisonings.

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