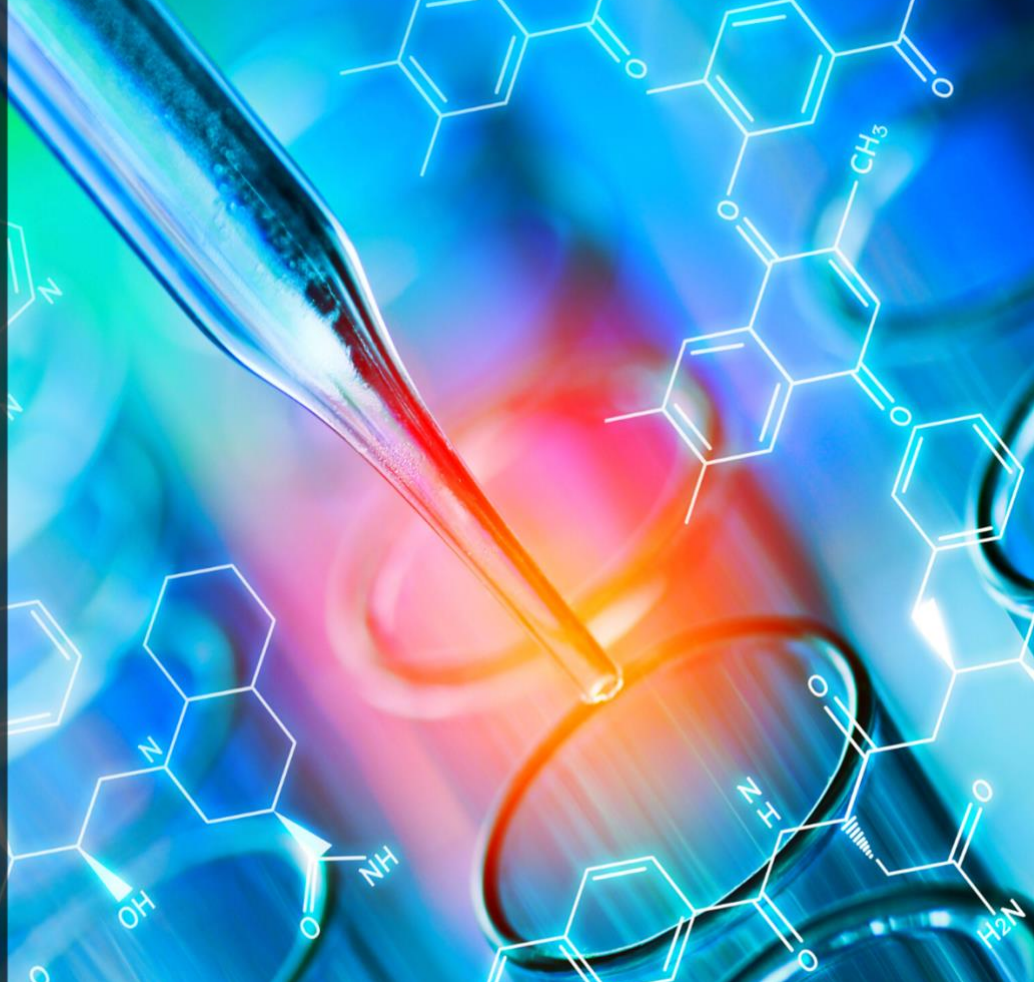




The 2022 Online Toxicology Symposium



Fiendish Foods

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Exposures to human foods are exceptionally common in small companion animals. In fact, human food exposures made up 13% of the ASPCA Animal Poison Control Center cases in 2020, making them the third most common type of exposure, with chocolate being the fourth most common. This lecture is designed to provide the veterinary practitioner with practical tips to use when addressing the most common human food intoxications in small animal patients.

***Allium* spp.**

Allium spp., more commonly known as onion and garlic, can cause oxidative damage to red blood cell membranes and hemoglobin when ingested in sufficient quantities. This can result in hemolytic anemia, methemoglobinemia, hemoglobinuria, weakness, icterus, and acute renal injury. The level of concern for cats is 5 g/kg of fresh onion and 1 g/kg of fresh garlic. The level of concern for dogs is 15 g/kg of fresh onion and 10 g/kg of fresh garlic. When a significant exposure has occurred, it is recommended that emesis is induced. If emesis is unsuccessful, then a single dose of activated charcoal can be administered and the patient's RBC morphology, PCV (or HCT), and urine color should be monitored for 5 days. If oxidative injury develops, then treatment includes fluid therapy, antioxidants, oxygen, and potentially blood transfusion.

Avocado

Avocados contain persin in the skin, flesh, seeds, leaves, and roots of the plant. Rabbits and birds are especially sensitive to the persin. Within 30 hours of exposure, they can develop pericardial and pleural effusions, subcutaneous edema, dyspnea, and death. Rabbits can also develop a sterile mastitis. Carnivores, such as dogs, cats, and ferrets, are much less sensitive to the poison and generally exhibit only mild gastrointestinal signs. Ingestion of the pit of an avocado, however, can cause a foreign body obstruction of the gastrointestinal tract. The exact mechanism of action is unknown, however, it is suspected to alter vascular permeability. Any ingestion of avocado by a bird or rabbit warrants decontamination either with crop lavage and/or the administration of activated charcoal. Patients should then be monitored for at least 30 hours near an oxygen source for the development of signs. If signs develop, treatment is symptomatic and supportive.

Macadamia nuts

Dogs are the only species known to be sensitive to macadamia nuts. The mechanism of action is not known, but within 12-24 hours of the exposure, dogs can develop vomiting, weakness, depression, ataxia, and tremors. The level of concern is 1 g/kg. If a significant quantity is ingested, vomiting can be induced, and the patient is then monitored. Most cases can be managed at home, however, if tremors develop, hospitalization for intravenous fluids and methocarbamol administration is indicated. Signs resolve in 12-48 hours and the prognosis is excellent.

Methylxanthines

Chocolate contains theobromine and caffeine, and coffee and tea contain caffeine. Methylxanthines cause stimulatory signs by several different mechanisms. Small exposures (under 40 mg/kg) will usually just cause minor gastrointestinal signs and possibly mild hyperactivity. Exposures of 40 mg/kg and greater can cause tachyarrhythmias and hypertension. Exposures of 60 mg/kg and greater can cause tremors and seizures. Exposures under 40 mg/kg can be monitored at home. Exposures of 40 mg/kg and greater warrant the induction of emesis. If, after emesis, the retained dosage is still suspected to be above 40 mg/kg, that patient should be admitted to the hospital for intravenous fluids, cardiac and CNS monitoring, and symptomatic management of signs. The use of activated charcoal is usually only recommended for severe coffee and tea exposures, as it can significantly increase the risk of developing clinical hypernatremia when administered with chocolate.

***Prunus* spp.**

More commonly known as almonds, cherries, apricots, and peaches, *Prunus* spp. fruits can pose a dual hazard. Ingestion of the pits can pose a risk for a foreign body intestinal obstruction in the right sized animal. In addition, the seeds of these fruits contain cyanogenic glycosides, chemical precursors to cyanide. Fortunately, the seeds are surrounded by a densely fibrous shell, which can contain the poison. However, when the pit is broken open, or commercially available bitter almonds, apricot kernels, or kernel powder is ingested, cyanide toxicity can occur. Cyanide inhibits the cellular use of oxygen so it can rapidly prove fatal. If cyanide toxicosis is a concern, emesis can be induced immediately after an exposure and ideally, under veterinary supervision. Due to the rapid onset of signs, it is usually not practical to administer activated charcoal. The preferred antidote is hydroxocobalamin (synthetic B12a) administered intravenously and the dosage is 75-150 mg/kg IV over 7.5 minutes. Sodium nitrite 3% (16 mg/kg IV) given with sodium thiosulfate (150-500 mg/kg IV) can also be used. Aggressive life supporting measures should also be taken.

***Vitis* spp.**

Grapes and raisins are known to cause acute kidney injury in dogs. The toxin is suspected to be tartaric acid. Grapes contain up to 2% tartaric acid, which is relatively high when compared to other produce. The toxic dosage for any individual dog is not known, however, it is recommended to take action when greater than 1 fresh grape or raisin (or 2 cooked raisins) per 10 pounds of dog is ingested. Emesis can be successful even up to 8-12 hours post exposure. If emesis is unsuccessful or only partially successful, then 48 hours of intravenous fluid diuresis and renal function monitoring is recommended.

Xylitol

Xylitol is a sugar alcohol commonly used as a sugar substitute. In dogs, xylitol triggers insulin release via its D-xylulose metabolite entering the pentose phosphate pathway. This results in hypoglycemia. Acute hepatic injury also develops through an unknown mechanism. Xylitol exposures of 100 mg/kg and greater can result in hypoglycemia, while exposures 500 mg/kg and greater can result in liver injury. Exposures under 200 mg/kg can often be managed with at home monitoring and small, frequent meals. Exposures of 200 mg/kg and greater warrant decontamination and in hospital monitoring of blood sugar, and possibly intravenous dextrose administration. Exposures of 500 mg/kg and greater should be started on intravenous dextrose (2.5-5%) and liver protectants, along with hepatic monitoring. Hepatic injury is usually evident within 24 hours of the exposure and often much sooner. If liver failure develops, vitamin K1 and plasma transfusions may become necessary.

Yeast Dough

Raw dough containing yeast can cause pathology via two mechanisms. The yeast will ferment sugars in the dough to product carbon dioxide gas and ethanol. The gas will cause expansion of the dough within the abdomen and can predispose the patient to gastric torsion. The ethanol can be systemically absorbed and result in the development of vomiting, depression or stupor, ataxia, hypothermia, hypoglycemia, metabolic acidosis, hypotension, and seizures. If the exposure is within 4 hours and the patient is asymptomatic, emesis can be induced. The condition of the stomach can be monitored with radiographs and the patient can be monitored for clinical signs. Ice water or ice chips can lower the temperature of the stomach and slow down the activity of the yeast. If CNS signs develop, acid/base and blood sugar should be monitored. The patient can be started on intravenous fluids and antiemetics. Naloxone may help reduce CNS depression. The vast majority of these cases can be managed medically and the need for surgical intervention is very rare.