ROYAL CANIN

VETERINARY EXCLUSIVE

Technical Bulletin

Common Household Foods that Should Not be Given to Dogs or Cats

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2014 Edition

Veterinary Case Consultation

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TABLE OF CONTENTS

ALCOHOL 2

AVOCADO 2

BONES OF ANY TYPE 2

CHEWING GUM 3

CHOCOLATE 3

COFFEE AND TEA 3

CYANIDE FROM DIFFERENT PLANTS 3

GRAPES 4

GREEN TOMATOES AND POTATOES 4

HOPS 5

MACADAMIA NUTS 5

MILK 5

MOLDY FOODS 5

ONION, GARLIC, LEEK, CHINESE CHIVES: VEGETABLES FROM THE ALLIUM GENUS 6

Oxalate-Containing Foods 6

Pit From Stone Fruits (Avocado, Peaches, Plums, etc.) 6

Raw Bread Dough of Any Type 7

Raw Meat 7

Raw Eggs 7

Salt 7

Useful Resources 7

References 8

COMMON HOUSEHOLD FOODS THAT SHOULD NOT BE GIVEN TO DOGS OR CATS

Many pet owners offer their companion animal food they are eating ("table-scraps"), not realizing this could result in a dramatic outcome. They are unaware that some common foods pose a serious threat to dogs or cats, due to food-related intestinal damage or obstruction, species-specific sensitivities, or differences in metabolism compared to humans.

Here is a list of common household food that should be considered a potential health threat to dogs or cats.

ALCOHOL

Alcoholic drinks and some foods contain alcohol in different concentrations. The alcohol in question is ethanol (ethyl alcohol) which, upon consumption, may lead to intoxication depending on the amount ingested. The most common clinical signs include disorders of the central nervous system (decreased reflexes, ataxia, depression), polyuria, vomiting, and diarrhea. More severe cases will exhibit dyspnea, tremors, metabolic acidosis, coma, and ultimately death (Lee 2011).

AVOCADO

Avocado (*Persea americana*) is known to be toxic to birds, but there are some reports of intoxication in various other species. The toxic principle is persin, a toxin found not only in the fruit, but also in the seeds, leaves, and bark of the plant itself. Even if it is reported that avocado may cause vomiting and diarrhea in dogs (ASPCA Animal Poison Control Center), it would not be considered as poisonous to dogs or cats (Pet Poison Helpline). Avocado toxicity has however been suspected in two dogs presenting with histories of dyspnea, progressively enlarging abdomen, ascites, pleural and pericardial effusion, and pulmonary oedema (Buoro 1994).

If swallowed whole, the pit can obstruct the digestive tract (oesophagus, small intestine).

BONES OF ANY TYPE

Bones, especially sharp fragments and thin, fragile ones (like chicken and fish bones), are improper treats for dogs since they may obstruct or perforate the intestines causing leakage of intestinal contents and potential life-threatening local and systemic infections. Clinical signs vary from cough, vomiting, anorexia, and abdominal pain to depression, weakness, hematemesis, hematochezia, melena, shock and death.

Chewing Gum

Many varieties of sugar-free chewing gums contain xylitol, a naturally occurring sugar alcohol sweetener used as a sugar substitute. It is also found in candies, mints, flavored multi-vitamins, desserts, baked goods and toothpaste. In dogs, xylitol strongly promotes insulin release, which can lead to severe hypoglycemia (Dunayer & Gwaltney-Brant 2006). Clinical signs include lethargy, ataxia, vomiting, collapse, and seizures. Some dogs develop acute liver failure (hepatic necrosis), and may experience disorders of blood clotting leading to hemorrhage, disseminated intravascular coagulation (D.I.C.), and often death (Dunayer 2004; Dunayer & Gwaltney-Brant 2006; Dunayer 2011).

Chocolate

Chocolate comes from the transformation of cocoa products (bean, butter). It contains theobromine, which is a methylxanthine alkaloid. The methylxanthine content is highly dependent upon the type of chocolate: the darker the chocolate, the higher the theobromine content. Theobromine acts by competitively inhibiting cellular adenosine receptors, which results in central nervous system stimulation and tachycardia (Gwaltney-Brant 2001). Depending on the dose ingested, methylxanthines can induce hyperactivity, tachycardia, arrhythmia, hyperthermia, panting, tachypnea, vomiting, diarrhea, polyuria, polydipsia, hyperreflexia, muscle rigidity, tremors, seizures, and potentially death (Dunayer 2008; Butler 2012).

Coffee and Tea

Coffee and tea are rich in caffeine, which is also a methylxanthine alkaloid, similar to theobromine in chocolate. Toxicity mechanism and clinical signs are the same.

Cyanide From Different Plants

Cyanogenic glycosides are found in many plants. Their degradation through enzymatic processes of digestion produces hydrogen cyanide, which could result in cyanide poisoning (CFIA 2012; NZFSA 2012). Examples of cyanoglycosides are amygdalin, found in the seeds of many fruits of the *Rosaceae* family (apple and pear seeds, almonds, seeds of many stone fruits); linamarin, found in cassava tuber and leaves (better known under the names of manioc, yucca or tapioca), Lima beans and flax seed meal; dhurrin, found in sorghum leaves; and taxiphyllin, found in young bamboo shoots (Shragg 1982; Haque & Bradbury 2002; EFSA 2004; Simeonova & Fishbein 2004). The seed of stone fruits (apricot, cherry, nectarine, peach, plum) is contained in the pit, in the form of an almond-looking kernel. Note that sweet almonds dedicated to human consumption are low in amygdalin as a result of breeding processes (NZFSA 2012).

The level of amygdalin in fruit seeds is however quite low (EFSA 2004), and intoxication would require consumption of a large amount (depending on the animal's size). Also, the kernel in stone fruits' pit is usually hardly accessible. Proper preparation and cooking of cassava roots, bamboo shoots and other plants usually render them safe for consumption (CFIA 2012).

Depending on the dose, clinical signs of acute cyanide poisoning include weakness, dyspnea, stupor, hypothermia, cyanosis, convulsion, coma and death (Sayre & Kaymakcalavu 1964; Rubino & Davidoff 1979; Lasch & El Shawa 1981; Vogel 1981; Moertel 1982; Suchard 1989; CICAD 2004; EFSA 2004). Chronic poisoning can induce ambivalence, slower response to stimuli, malnutrition, hyperglycemia, congenital malformations, neurological disorders and myelopathy (Vogel 1981; Jackson 1988; EFSA 2004).

Note that ingestion of stone fruits' pit can cause upper respiratory and gastrointestinal tract obstruction (see below).

GRAPES

Acute renal failure has been reported in dogs and cats following ingestion of grapes (the fruits of the plant *Vitis vinifera***)**, or any derivative of the fruit including raisins, sultanas and currants (Gwaltney-Brant 2001; Porterpan 2005). The toxic principle remains unidentified yet (Means 2002; Ajub 2004), but unpublished data indicates that the toxic component is water-soluble, and contained within the flesh of the fruit (not the seed). It is still undetermined yet if grape juice ingestion poses a health hazard. Not all dogs and cats seem susceptible since some dogs appear to tolerate large amounts of grapes and raisins without showing any clinical signs. Individual risk factors could be involved in patients developing toxicity. Clinical signs include oliguria, anuria, lethargy, nausea, vomiting, diarrhea, anorexia, and dehydration (Butler 2012).

GREEN TOMATOES AND POTATOES

Many food plants from the family *Solanacea*e, as tomatoes and potatoes, contain solanine, a glycoalkaloid that can reach toxic level under certain circumstances (Bohta 2008). Solanine is essentially concentrated in the plant itself (Jauron 2004).

Consumption of the tuber from potato plant (*Solanum tuberosum*) is generally safe, however the solanine concentration is high in the sprouts ("eyes"), and may increase in the tuber following exposure to light, mechanical damages, improper storage conditions, and sprouting. When exposed to light, tubers will turn green because of chlorophyll synthesis, which therefore constitutes an indicator of toxicity. Cooking does not destroy the toxins (Sharma 1989). Potato also contains chaconine, a glycoalkaloid related to solanine (Badowski 1999).

In tomato (*Solanum lycopersicum*), solanine is also present in the green, unripe fruit. The level dramatically decreases with ripening (Van Wyk 2002).

Clinical signs of solanine and chaconine intoxication include vomiting, diarrhea, muscle tremors, anxiousness, opisthotonos and seizures (Singh 2008).

HOPS

Hops (*Humulus lupulus*) is used in the process of brewing beer. Pets living in house where home brewing is performed could be exposed. The toxic principle is unknown yet. Clinical signs include anxiety, tachycardia, tachypnea, panting, hyperthermia, vomiting, abdominal pain, clotting abnormalities, seizures and death. Considering the malignant hyperthermia-like presentation, breeds at risk for malignant hyperthermia (ex. greyhounds, northern breeds) may be at greater risk (Duncan 1997; Pet Poison Helpline).

MACADAMIA NUTS

Macadamia nuts have been reported to induce weakness, depression, vomiting, ataxia, tremors, and hyperthermia, usually within the first 12 hours after ingestion (Hansen 2000; Hansen 2002). The toxic principle is currently unknown.

MILK

Some cats and dogs have, or develop lactase enzyme deficiency leading to lactose intolerance (Sahi 1994). Clinical signs reflect gastrointestinal upset, mainly diarrhea and vomiting (ASPCA Animal Poison Control Center).

MOLDY FOODS

Moldy foods are usually eaten inadvertently by pets, and roaming dogs are evidently more prone to it because they are more exposed to spoiled food in garbage. The toxicity is due to certain toxins produced by various species of molds.

Tremorgenic mycotoxins, such as penitrem A and roquefortine C (Schell 2000; Young 2003), are produced by different types of molds, mainly *Aspergillus*, *Claviceps* and *Penicillium* species. Molds can grow on almost any type of food such as dairy products, nuts, vegetables and grains. Penitrem A toxicity results from an increase in neuronal resting potential, a facilitation of transmission across motor end plates, and a prolongation in the duration of depolarization (Butler 2012). Clinical signs of toxicity include vomiting, panting, hyperactivity, hypersalivation, tachycardia, behavior alterations, depression, incoordination, and fine muscle tremors starting over the face and head that may rapidly progress to more severe tremors of the entire body and seizures, pulmonary oedema and coma. Usually, death occurs within 2 to 4 hours, and is generally secondary to respiratory compromise, metabolic acidosis or hyperthermia.

Aflatoxins are metabolites produced by some *Aspergillus* fungus species. Apart from their carcinogenic, mutagenic and immunosuppressive properties, they have potent toxic effects. Aflatoxins are rapidly absorbed from the gastrointestinal tract and extensively metabolized by the liver into

epoxide, which induces oxidative damages especially into the liver, resulting in hepatic necrosis and potentially subsequent liver failure. Aflatoxicosis cases have been documented in dogs. Clinical signs include anorexia, depression, weakness, vomiting, bloody diarrhea, oliguria, ascites, disseminated intravascular coagulation, icterus, hemorrhage, and anemia (Ketterer 1975; Hagiwara 1990; Dunayer 2011).

ONION, GARLIC, LEEK, CHINESE CHIVES: VEGETABLES FROM THE *ALLIUM* GENUS

Allium species contain various organosulphurated compounds. After ingestion, those compounds are metabolized to highly reactive oxidants (Amagase 2001), which generate oxidative damage to the hemoglobin molecules within erythrocytes. When their concentration exceeds the antioxidant capacity of the red blood cells, hemolysis occurs (Cheeke 1998). Dogs are susceptible to *Allium* intoxication due to the low antioxidant activity of their erythrocytes' catalase (Nakamura 1998). Feline hemoglobin contains a higher number of sulfhydryl groups and is about 2 to 3 times more susceptible to oxidative damages than other species' (Harvey 1976). Toxicosis has been reported in dogs and cats following ingestion of fresh, dried, or powdered plant material (Cope 2005), as well as in cats fed commercial baby food containing onion powder (Robertson 1998).

Cooking does not reduce the toxicity potential of those vegetables (Burrows 2001).

Please note: The *Allium* genus belongs to the *Liliaceae* family. Many domestic and wild plants belong to this family, such as lilies and tulips, and the ingestion of some / all of their parts (especially the bulb) could also be hazardous to dogs or cats (Fitzgerald 2010; Slater & Gwaltney-Brant 2011).

OXALATE-CONTAINING FOODS

Many foods contain various levels of oxalate, which could lead to calcium oxalate crystalluria and urolithiasis. Those foods are mostly from vegetal origin (vegetables, fruits, legumes, cereals, nuts, seeds, grains), but some dairy products and sweets, candy, desserts and baked goods may also contain some oxalate. All Bran® cereals, almonds and many types of nuts, beets, buckwheat flour, chocolate soy milk, miso, rhubarb leaves, sesame seeds, spinach, Swiss chard, and tahini are listed to be amongst the foods having very high level of oxalate. Please refer to the Oxalosis and Hyperoxaluria Foundation website (http://ohf.org/diet.html) for a more extensive list of foods regarding their oxalate content.

PIT FROM STONE FRUITS (AVOCADO, PEACHES, PLUMS, ETC.)

Large pits from fruits pose a choking hazard as they may obstruct the oesophagus, small intestine, or the upper respiratory tract. Clinical signs include cough, dyspnea, apnea, collapse, anorexia, vomiting, diarrhea, abdominal pain, and depression.

Raw Bread Dough of Any Type

Baker's yeast (*Saccharomyces cerevisiae*) is added to raw bread dough as a leavening agent. In converting fermentable sugars into carbon dioxide gas, they cause the dough to expand as gas bubbles form. Eaten raw, bread dough may expand to many times its original volume, potentially creating an obstruction of the digestive tract. Clinical signs may include abdominal pain, bloating, vomiting, incoordination and depression (Means 2003).

The fermentation process also produces ethanol, which could lead to ethanol toxicosis (see "Alcohol").

Raw Meat

Ingestion of uncooked meat could pose a major health threat to pets as it could contain toxigenic bacteria, such, as for *E. coli* (mainly in beef) and *Salmonella spp.* (mainly in poultry). Regular and frequent handling of such products could also pose a human threat due to skin and surface contamination as a result of daily preparation of the meat for consumption.

Raw Eggs

Raw egg white contains avidin, an enzyme decreasing biotin absorption (Wedekind 2010). Deficiency in biotin mainly leads to hair loss, xerodermia, and squamosis, but could also cause weakness, growth delay, or skeletal deformity (Wedekind 2010; Miller 2013).

Salt

Significant consumption of salt leads to polyuria and polydipsia and could interfere with the metabolism of some drugs such as KBr (Verneau 2012). Excessive salt ingestion through products like salt dough could lead to sodium ion poisoning, for which clinical signs include vomiting, diarrhea, depression, tremors, hyperthermia, seizures, and potentially death (Kasai & King 2009).

Useful Resources

Animal Poison Control Center: http://www.aspca.org/pet-care/poison-control/

Pet Poison Helpline: http://www.petpoisonhelpline.com

VIN – Guide to Common Poison Emergencies:
http://www.vin.com/Members/CMS/document/default.aspx?pid=219&catid=&objectid=11873&objecttypeid=10&redirectFromMiscDefault=1&calc=

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