There's xylitol in *that* too?

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Surprise! Xylitol appears in products you'd never suspect.

Pet Poison Helpline (PPH) has discovered that xylitol, a sweetener which causes hypoglycemia and hepatic necrosis in dogs, is showing up in some *very* unexpected places. New products on the market such as nasal sprays, OTC sleep aids, multivitamins, prescription sedatives, antacids, stool softeners, smoking cessation gums, and more may contain unexpectedly large amounts of xylitol. Dogs that ingest these products face a double risk—not only may poisoning result from the active ingredient but also from the xylitol. This can result in a variety of serious and unanticipated clinical signs which can readily complicate clinical treatment and prognosis.

Xylitol is a natural sugar-alcohol normally found in small amounts in many fruits and vegetables. Because of its sweet taste and plaque fighting properties, it is frequently used as a sugar substitute in chewing gum, breath mints, and dental products like toothpaste and mouth wash. Non-toxic amounts are even found in some pet dental products. Due to its low glycemic index, it is also sold in bulk as a substitute for table sugar. PPH has had several cases of dogs becoming intoxicated after ingesting homemade bread, muffins and cupcakes made with xylitol.

Tips and caveats:

1. **How to obtain the amount of xylitol in a product**
   Xylitol is typically considered part of a product's "proprietary ingredients" so the quantity will not be listed on the package label. While some companies are very willing to release the amount of xylitol in their products, others are hesitant to do so and may even ask for veterinarians to sign confidentiality statements prior to release. At Pet Poison Helpline, we work hard to obtain and catalog the quantity of xylitol in products. Most companies have been willing to share information with us for use in emergency case management. When you're in doubt of the xylitol quantity, it's best to contact an animal poison control center for assistance.

2. **Interpreting the placement of xylitol in an ingredient list**
   In some cases, it can be helpful to use the location of xylitol within an ingredient list to estimate its quantity in the product. For example, in the USA, all foods must list their ingredients in descending order of predominance by weight. This means that the ingredient that weighs the most is listed first, and the ingredient that weighs the least is listed last. In general, for most chewing gums, the amount of xylitol is often clinically insignificant if it's listed as the 4th or 5th ingredient. If it's listed as one of the first three ingredients, extreme caution should be taken.

   For drugs and dietary supplements, the regulations regarding the order of ingredients is considerably different. In this case, xylitol is often considered an "inactive ingredient" or "other ingredient"—such ingredients are *not* required to be listed in order of predominance. Often, they are listed in alphabetical order which may lead an uninformed pet owner or veterinary professional to incorrectly assume that there is a very low concentration of xylitol in the product.

Novel sources of xylitol:

Over the counter medications

- Axia3 ProDigestive Antacid (flavored chewable tablets)
- Children's Allegra Oral Suspension
- Fleet Children's Pedia-Lax Liquid Stool Softener
- Umcka Cold and Flu chewable tablets (homeopathic product)

Dietary supplements and vitamins

- KAL Colostrum Chewable, Vanilla Cream
- KAL Dinosaurs Children's Vitamins and Minerals (chewable tablets)
- Kidz Digest Chewable Berry from Transformation Enzyme
- L'il Critters Fiber Gummy Bears
- Mega D3 Dots with 5,000 IU of Vitamin D3 per "dot" (dissolvable tablet)
- Suntheanine L-Theanine chewable tablets by Stress-Relax
- Vitamin Code Kids by Garden of Live (chewable multivitamins)
- Webber Natural Super Sleep Soft Melts (dissolvable tablets)

Nasal products

- Xlear Sinus Care Spray
- Xylear Nasal Spray (for adults and children)
- Xyliseptic Nasal Spray

Prescription drugs

- Abilify Discmelt Orally Disintegrating Tablets (aripiprazole), an atypical antipsychotic
- Clonazepam Orally Disintegrating Tablets, benzodiazepine
- EMTRIVA oral solution (emtricitabine), HIV-1 reverse transcriptase inhibitor
- Mobic Oral Suspension (meloxicam), nonsteroidal anti-inflammatory
- Neurontin (gabapentin) Oral Solution
- Riomet (metformin) Oral Solution, anti-diabetic agent
- Varibar barium sulfate products, liquids and puddings for swallowing studies
- Zegerid Powder for Oral Suspension (omeprazole), proton pump inhibitor

Foods with xylitol as the primary sweetener (excluding gums and mints)

- Clemmy's Rich and Creamy ice cream products
- Dr. John's products (hard and soft candies, chocolates, drink mixes, etc.)
- Jell-O sugar free pudding snacks
- Nature's Hollow jams, syrup, ketchup, honey, etc.
- SparX Candy
- Zipfizz energy drink-mix powders

Toxic doses and treatment recommendations:

The toxicity of xylitol is dose dependent. The dose necessary to cause hypoglycemia in dogs is approximately 0.1 grams/kg, while the amount needed to cause hepatic necrosis is approximately 0.5 grams/kg. Rarely, hepatic necrosis can be seen without prior hypoglycemia. Most chewing gums and breath mints typically contain 0.22-1.0 gram of xylitol per piece of gum or per mint. **Therefore, only one piece of gum may result in hypoglycemia in a 10 pound (4.5 kg) dog.** Hypoglycemia is typically evident within 1-2 hours of xylitol ingestion but, in rare cases, has been delayed as much as 12 hours. Prompt and appropriate gastric decontamination in asymptomatic patients is essential to prevent poisoning. Activated charcoal does not bind well to xylitol and is not recommended. Should hypoglycemia develop, supplementation with intravenous dextrose is needed until the dog can self-regulate its blood glucose concentrations (typically 12-48 hours). For dogs exposed to hepatotoxic doses of xylitol, preemptive administration of dextrose (prior to the onset of hypoglycemia) may be helpful. Additionally, close monitoring of hepatic enzymes is warranted as evidence of necrosis may be seen in 1-2 days following exposure. Should hepatic necrosis develop, IV fluids, dextrose, hepatoprotectants and monitoring of coagulation profiles are needed. The prognosis following xylitol exposures is excellent when the ingestion is caught early, decontamination is performed, and blood glucose is monitored frequently. The prognosis becomes guarded if the dog has already begun to develop hepatic failure.

Pet Poison Helpline, an animal poison control center based out of Minneapolis, MN is available 24/7 for pet owners and veterinary professionals that require assistance treating a potentially poisoned pet. The staff provides treatment advice for poisoning cases of all species, including dogs, cats, birds, small mammals, large animals and exotic species. As the most cost-effective option for animal poison control care, Pet Poison Helpline's fee of **$39.00** per incident includes follow-up consultations for the duration of the poison case. Pet Poison Helpline is available in North America by calling **800-213-6680**. Additional information can be found online at www.petpoisonhelpline.com.