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## Antifreeze: Why Bitter-Tasting Additives May Not Be Enough to Prevent Ingestions.

Antifreeze is a synthetic (man-made) type of alcohol added to the water in our car's radiator to prevent freezing in cold weather. Many antifreeze products are made with *ethylene glycol* -- a clear, colorless, odorless liquid with a sweet taste. Colored dyes (usually green but sometimes blue or orange) are added to antifreeze to help identify the liquid and to help trace the source of leaks.

Ethylene glycol is itself an alcohol, and can cause intoxication. However, it is metabolized (changed) in the body into several other highly toxic compounds. Symptoms of ethylene glycol poisoning

may include nausea, vomiting, inebriation, central nervous system dysfunction, breathing problems, dangerous changes in heart rhythm, and injury to the kidneys and other organs. Some symptoms can be delayed by many hours, which could lead to a delay in treatment. Such delays could be fatal.

Many cases of ethylene glycol poisoning are due to the accidental ingestion of it by young children. Children, pets, and wildlife are attracted to the sweet taste. Alcoholics may mistakenly drink it as a substitute for *ethanol*, the type of alcohol

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## Focus on Food Poisoning

You spent hours on the turkey, mastered your first homemade gravy, and successfully kept the pie crust from burning. Your holiday meal will be delicious! By taking a few extra steps, the only discomfort afterwards will be from full stomachs.

Improperly prepared, cooked, or stored food can contain foodborne pathogens: disease-causing bacteria, viruses, fungi, or

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### TOXIC TRIVIA

One teaspoon of this fragrant herbal product—which some believe provides relief from muscle aches and pains—is the chemical equivalent of nearly 23 adult aspirin tablets...a potentially life-threatening dose for a small child. What is this product?

Answer on pg. 3

found in beverages such as beer, wine, or liquor. Ethylene glycol is also sometimes swallowed intentionally by people who are trying to harm themselves.

In December 2012, the Humane Society Legislative Fund and the Consumer Specialty Products Association announced an agreement to voluntarily add a bitter-tasting chemical to antifreeze manufactured for sale for the consumer market in all 50 states and the District of Columbia. The substance used is *denatonium benzoate*, commonly called Bitrex®. Bitrex® can also be found in many other products; including some cosmetics, cleaning products, and pesticides; as a means to prevent poisoning. The thinking behind its use is that if someone tried to swallow a product containing Bitrex®, they would spit it out because of the extremely bitter taste. Unfortunately, this does not always happen and poisonings still occur.

One 2015 study<sup>1</sup> compared the cases of children who swallowed antifreeze both before and after the Bitrex®-containing products were introduced to U.S. markets. Researchers determined there was no difference in the *frequency* of childhood antifreeze ingestions, nor in the *amount* of product swallowed per case. There was also no difference in the medical outcome of the children who swallowed antifreeze with or without Bitrex®.

“Unfortunately, young children have unpredictable reactions to bad tastes or smells,” says Kristin Wenger, Education Coordinator for the Blue Ridge Poison Center. “Parents frequently share stories with me of disgusting things their child ate. Some of these stories are pretty funny, but some are frightening and have resulted in harm to the child. Bottom line: don’t assume that a child will naturally



avoid or spit out any product that contains Bitrex®.”

Researchers also examined whether the addition of Bitrex® had an effect on those who intentionally drank it to harm themselves. After Bitrex®-containing products were introduced to U.S. markets, there was no change in the number of people who attempted suicide by drinking antifreeze. There was also no difference in the amount that they swallowed, what kinds of medical treatment they needed, or medical outcome.

In conclusion, Bitrex® does not seem to be a strong deterrent in cases of accidental or intentional ingestion. It still may prevent some people from swallowing a product like antifreeze (or swallowing large amounts), but alone it is not enough to prevent all poisonings. Additional precautions should be taken to protect others from antifreeze, including:

- Clean up antifreeze spills immediately.
- Check the ground beneath your car's engine regularly for leaks. A green or blue liquid may indicate antifreeze.
- Store antifreeze in clearly marked containers up high, out the sight and reach of children.
- When you replace antifreeze, or if you flush your radiator, remember to take the used antifreeze to your local auto repair or radiator shop where it can be disposed of properly or recycled. Never flush it down the drain or dump it into a driveway, roadside, or waterway. (Not only is that dangerous to people, pets, and wildlife-- it is illegal).

If you suspect that someone has ingested any amount of antifreeze, contact the Blue Ridge Poison Center immediately. Do not wait for symptoms to develop. Call 1-800-222-1222, 24-hours a day, any day of the year.

<sup>1</sup> White NC, Litovitz T, White MK, Watson WA, Benson BE, Horowitz BA, Marr-Lyon L. The impact of bittering agents on suicidal ingestions of antifreeze. Clin Tox. 2008;46:6:507-514.



parasites that can make you sick. Symptoms can include fever, headache, diarrhea, abdominal pain and often vomiting. Foodborne pathogens are sneaky. You cannot always detect them by looking at or tasting food.

According to the U.S. Food and Drug Administration (FDA), food poisoning sends more than 100,000

Americans to the hospital each year. There are four basic steps to keeping your food safe: Clean, Separate, Cook, and Chill.

**Clean:** Wash hands for at least 20 seconds before and after handling food, and after using the bathroom, changing diapers, or handling pets.

Wash cutting boards, countertops, and utensils after they touch raw animal products (meat, poultry, eggs, or seafood).

Rinse fruits and vegetables under running tap water, even if you plan to peel them.

**Separate:** Separate raw animal products from other foods in your grocery bags and refrigerator.

Don't reuse marinades that touched raw animal products, unless you boil them first.

Consider having a separate cutting board for raw animal products.

**Cook:** Always heat food to the correct internal temperature. Use a food thermometer to be sure. Turkey and other poultry should reach 165 degrees F. For a chart listing safe temperatures for other foods, visit [www.foodsafety.gov](http://www.foodsafety.gov).

Keep food hot—at least 140 degrees F---after cooking and before eating.

**Chill:** Keep your refrigerator at least 40 degrees F.

Refrigerate or freeze food within 2 hours of cooking or purchasing.

For more tips to keep that most unwelcome holiday guest – food poisoning – from messing up your perfect holiday meal, visit [www.foodsafety.gov](http://www.foodsafety.gov).

## NEWS AND NOTES



**ATTENTION SENIORS** and those who work with older adults: The Blue Ridge Poison Center wants to help seniors learn to take their medicines safely and to protect young children in their lives from

medicine poisoning. If your group of at least 10 senior adults would like to schedule a 1-hour presentation from our Health Educator, contact Kristin Wenger at 434-982-4386 or [klw2s@virginia.edu](mailto:klw2s@virginia.edu). We will travel to your location. The presentation is free, and all participants will receive FREE materials including a personal drug disposal kit.



**DID YOU KNOW** the Blue Ridge Poison Center will help you identify an unknown pill? If you misplace an original container, accidentally mix your medicines together, or find a loose pill somewhere, call our hotline: 1-800-222-1222 any time of the day or night for free and confidential assistance.

This free, quarterly newsletter is courtesy of the Blue Ridge Poison Center, serving Southwestern and Central Virginia and the Shenandoah Valley. We encourage you to print, post, forward, or share in any way. Please share it entirely; do not cut out portions without permission. If you have suggestions or comments, or want to sign up to receive new issues automatically, contact Kristin Wenger, Health Educator, Blue Ridge Poison Center, University of Virginia Health System: 434-982-4386 or [klw2s@virginia.edu](mailto:klw2s@virginia.edu).

Poison Safety Tips & More! Follow us on Twitter @blueridgepoison

Poison Trivia Answer: Oil of Wintergreen