Erythritol: The Other Sugar Alcohol

By Tanya L. Smith, RDH, BS - July 30, 2018
The sugar alcohol family, known as polyols, have become popular in chewing gums, lozenges, and dental hygiene products due to their unique ability to add sweetness and improve oral health. Introduced in 1970, xylitol has recently been at the forefront of the discussion with benefits backed by extensive research. It has been incorporated into many dental hygiene products across several brands. Yet there are a few other members of the polyol family gaining popularity. Erythritol, in particular, has similar properties to xylitol and stands the test against bacteria forming plaque acids just as well. In most cases, erythritol is actually more effective. Erythritol is worth a closer look for dental professionals and patients, not to replace xylitol, but as an alternative with its own wonderful benefits.

Commonly known sugar alcohols include isomalt, hydrogenated starch hydrolysates (HSH), lactitol, mannitol, maltitol, sorbitol, and xylitol. They are carbohydrates that have chemical characteristics of sugars and alcohols. Erythritol is the smallest molecular member of the polyol family, a four-carbon sugar, it is found in algae, fungi, and lichens. Introduced to the market in 1990, it is available in over sixty countries today. It is the only polyol commercially produced from sugars and starches by fermentation. Wine, sake, beer, watermelon, pears, grapes and soy sauce are among several foods naturally containing erythritol.
Polyols are not metabolized by oral bacteria and do not contribute to cariogenic activity while reducing acid production, but the ability to reduce or inhibit bacterial growth and maturation is unique to erythritol. In vitro studies of erythritol showed, the sugar alcohol decreased adherence of fourteen different strains of polysaccharide forming oral streptococci. This means erythritol inhibits growth and reduces the effects of some caries-related *Streptococcus mutans* on the oral cavity. The authors of the study believed the mechanism of action to be that erythritol “passes through the cell membrane and suppress growth by interfering with enzymatic pathways involved in *S. mutans* growth.”

As far as biofilm reduction, a separately released portion of the study found that erythritol works “via several pathways, including suppression of growth resulting from DNA and RNA depletion, attenuated extracellular matrix production, and alterations of dipeptide acquisition and amino acid metabolism.” When incubated with a 10% concentration of erythritol the process inhibits the maturation of the microstructure and unique chemical fingerprint of gingivitis-associated bacteria such as *Porphyromonas gingivalis* and *Streptococcus gordonii*. Each of these effects reduces overall biofilm formation and at higher levels of incubation with erythritol were found to inhibit some bacterial growth completely. When compared to xylitol and sorbitol, erythritol had the highest overall reduction of dental plaque weight and *S. mutans* levels.
Erythritol powder with air polishing in periodontal therapy is a great option for clinical application of the polyol. It has a similar particle size and abrasive quality to the more commonly used glycine powder and has no cariogenic properties. It also adds the benefit of a sweet taste to the procedure. Thirty-eight participants in a randomized, controlled, parallel-group clinical trial showed improved clinical attachment and reduced bleeding with probing and pocket depths. Results from air polishing with erythritol and traditional hand scaling therapy were not statistically different, but in feedback, air polishing was the preferred treatment by participants.

Erythritol’s benefits are not limited to the oral cavity and may be helpful in a number of chronic health issues. It has no calories, no effect on blood glucose levels, and erythritol has up to 80% the sweetness of sucrose making it a perfect sugar substitute for diabetic patients. Cardiac patients may also be interested to know that erythritol has been found to improve small vessel endothelial function and cardiac vasodilation by reducing arterial stiffness.

Erythritol is different from the rest of the sugar alcohols in that the small molecular size allows it to be more rapidly and completely absorbed in the small intestine. It is not metabolized by the body and is excreted in the urine unchanged. Other sugar alcohols, including xylitol, have much slower absorption rates. With the exception of erythritol, in large amounts, all other sugar alcohols may pass into the colon leading to gastrointestinal discomfort. There have been many studies showing no adverse effects by consuming erythritol in the same amounts, making it the best polyol option for those with IBS or other gastrointestinal concerns.

Daily use of erythritol may provide oral and systemic benefits for patients. Erythritol has many...
chewing gum, hard candies, toothpaste, xerostomia products, and many other reduced-calorie sugar-free food products.

**SEE ALSO:** All About Xylitol: The New Sugar Sweetness with Benefits

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### References


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