



**ERYTHRITOL'S SWEET SUCCESS:**

# Sugar reduction in confectionery

There's no denying America's sweet tooth. The market research firm Packaged Facts, in its recent report on candy trends, noted that more than half of adults eat 10 or more servings of chocolate and other candy every month.<sup>1</sup> Yet those same consumers insist they're trying to reduce their intake of sugar – or avoid it altogether.<sup>2</sup>

At first blush, reconciling those two realities might seem impossible, but Cargill's Ravi Nana, an expert in reduced-sugar confections, insists it is possible to satisfy consumers' sweet candy cravings while minimizing their sugar intake. The secret, he says, lies in one of nature's lesser-known sweet molecules – erythritol.

Found in low levels in fruits such as pears, melons and grapes, Cargill uses fermentation to make commercial quantities of erythritol. It's part of a class of ingredients known as polyols. Erythritol offers a number of advantages over its relatives, including its status as a zero-calorie sweetener and reputation for a clean, sweet, sugar-like taste. It also boasts the highest digestive tolerance compared to other polyols, an especially important consideration for indulgent products like candies.

While not quite as sweet as the sugar it replaces (it's about 70 percent as sweet) erythritol pairs well with high-intensity sweeteners like stevia. It has flavor-modifying properties that round out stevia's sweetness profile, while at the same time, it replaces sugar's bulk.



## Mints and gums take a bite out of sugar

Mints and gums, which pioneered the sugar-free candy space, offer a window into the possibilities.



Today, sugar-free chewing gum holds more than **50 percent of the global gum market**, driven largely by concerns about tooth decay.<sup>3</sup>

For parents and others with a penchant for oral health, Nana notes that products made with Cargill's **Zerose® erythritol** have an added advantage. Research shows that erythritol is more effective than the polyols sorbitol and xylitol at preventing tooth decay. In a three-year study, erythritol reduced dental plaque weight, while other polyols in the study caused little to no change. Erythritol also lowered the levels of the *Streptococcus mutans* bacteria – a significant contributor to tooth decay – better than xylitol and sorbitol.<sup>4</sup>

It's not just oral health benefits that make erythritol an attractive choice for mints and gums; it also amplifies the cooling effect of mint-flavored products. "When erythritol dissolves in the mouth, it has a relatively high negative heat of solution, creating a pleasant, cooling sensation," Nana explains.

On the functional side, confectioners will find erythritol is an excellent option to keep chewing gum soft and pliable – enhancing the chewing experience and extending shelf life. It's even found a place in gum coatings, where Nana says the blend of erythritol and maltitol slows down the crystallization speed of erythritol, which helps in the gum coating process.

## Better-for-you chocolate coatings

Still, while mainstream consumers have long accepted sugar-free offerings in the gum and mint space, they've been slower to embrace other reduced-sugar and sugar-free confections. That may be changing, as sugar continues to come under fire. For Nana, those evolving attitudes spell opportunity.

"In chocolate, sugar contributes about one-third of the calories," Nana explains. "If we can replace that sugar with zero-calorie erythritol, that's a significant reduction."

In addition to its calorie-free status, erythritol offers some unique functional benefits well-suited to chocolate applications. Chief among them: it can be processed at the same temperature as sugar. "That's a notable difference between erythritol and other polyols," Nana notes, "It doesn't require any major changes to production processes."

Erythritol has other attributes in common with sugar as well – from its excellent gloss and good snap characteristics, to its pleasant melt-in-your-mouth properties. However, unlike sugar, erythritol is non-hygroscopic – which means it won't absorb moisture, a definite plus for notoriously sticky chocolate coatings (and hard candies, too).

Then there's its previously mentioned cooling effect. It's a clear benefit for mint-flavored chocolatey products, but easy to mitigate in chocolatey coatings and candies with other flavor profiles. To reduce the effect, Nana advises formulators to add fibers like chicory root fiber or polydextrose.

## Hard candies and more

It's also possible to use erythritol to create memorable hard candies, gummies, fondant and more. In sugar-free fondant, Ravi says the bulk sweetener's fast crystallization properties result in a smooth texture without a hint of grittiness. In hard candies with sherbet fillings, erythritol's high cooling effect contributes to the sensory experience. And regardless of the confection application, its non-hygroscopic nature results in excellent shelf life.

Nana believes erythritol has plenty to offer the sugar-conscious confectionery space, but he leaves confectioners with one final bit of advice.

"Chocolate and other candies are first and foremost indulgences, and consumers have high expectations for how they look, taste and feel," he explains. "It takes careful formulation, but Zeros<sup>®</sup> erythritol gives consumers a way to have their sweets and guiltlessly enjoy them, too."



### TOOTH-FRIENDLY LOLLIPOPS

Dr. John Bruinsma, DDS and founder of Dr. John's Candies, used Zeros<sup>®</sup> erythritol to create the world's first line of natural, sugar-free lollipops, THRIVE<sup>™</sup> nutritional lollipops.

"Parents bring kids to their dentist hoping to reduce or eliminate dental decay," said Dr. Bruinsma. "While parents could just say 'No more sugar, period,' that is awfully hard for kids to do. Erythritol-based options let kids enjoy sweet treats, without the sugar."

Learn more about Cargill's innovative solutions for sugar reduction:  
[cargill.com/sugarreduction](https://cargill.com/sugarreduction) | [zerosesweetener.com](https://zerosesweetener.com)

#### Sources

<sup>1</sup> Packaged Facts. "Non-Chocolate Candy: U.S. Market Trends and Opportunities," October 2018.

<sup>2</sup> "2019 Food & Health Survey," International Food Information Council. May 22, 2019. <https://foodinsight.org/thanks-for-your-interest-in-the-ific-2019-food-health-survey/>

<sup>3</sup> Mordor Intelligence. "Sugar-Free Chewing Gum Market – Segmented by Distribution Channel and Geography, Growth, Trends and Forecast (2019-2024)." <https://mordorintelligence.com:81/industry-reports/sugar-free-chewing-gum-market>

<sup>4</sup> De Cock, P; Mäkinen, K; Honkala, E; Saag, M; Kennepohl, E; Eapen, A. "Erythritol is More Effective than Xylitol and Sorbitol in Managing Oral Health Endpoints." International Journal of Dentistry. 2016: 9868421. Published online 2016 Aug 21. doi: 10.1155/2016/9868421