

A Clean Label Sweetener to Feel Good About

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Could sugar—part of the human diet for as long as there’s *ever* been a human diet—now find itself in the same unenviable position that tobacco occupied in the 1990s, when it was the target of tightening regulations, widespread lawsuits and even congressional investigation? Now, roughly two decades on—and with evidence of excess sugar’s dangers mounting—it’s hard not to feel that we might be approaching that breaking point yet again.

For sugar—particularly in the amounts that the developed West ingests—contributes to health problems that take as much a toll on society as tobacco ever did. And as public health professionals, governments and consumers digest the full scope of sugar’s ill effects, they’re putting the same pressure on the food industry that they did on the tobacco industry before it to make a change, *or else*.

And industry has been keen to respond, as both sugar suppliers and users recognize that the market for sweeteners is evolving before their eyes. But before they hitch their wagons to any sugar alternative, they need to know that the alternative actually *works*: in formulations, on “clean” labels and, most importantly, in consumers’ bodies. Finding a sugar substitute that does all three has been an uphill battle. Until now.

Sick of Sugar

That heavy sugar consumption entails risk is nothing new; we all recall childhood dentists encouraging us to go light on the candy, lest we wind up with a cavity to fill. But sugar’s effects on health extend well beyond the dentist’s chair, and it seems that we’re learning about new risks every day.

Look no further than the data to make the connection. According to the Centers for Disease Control and Prevention (CDC) statistics¹ from 2005 to 2010, adult American men got an average of 335 kcals of their daily caloric intake from added sugars while adult American women took in 239 kcals. Further, the American Diabetes Association² tracked the number of Americans with diabetes in 2015 at 30.3 million, or 9.4% of the population. Fully 84.1 million of Americans 18 and over had prediabetes—a condition that will progress to full-on diabetes in one half of those cases. And when you add up diabetes’ cost, it came out to \$245 billion in 2012, the American Diabetes Association found—which is money that could be put to work much more productively elsewhere in the economy.

Yet diabetes—and its frequent companion obesity—are only the most well-known of excess sugar’s consequences, with emerging research suggesting that the macronutrient may exacerbate other conditions, from heart disease and hypertension to stroke, dyslipidemia, irritable bowel syndrome, and more.

As a result, declares Laura Schmidt, Ph.D., professor of health policy at UC San Francisco, in a commentary³ in *JAMA Internal Medicine*, “We are in the midst of a paradigm shift in research on the health effects of sugar, one fueled by extremely high rates of added sugar overconsumption.” Too much sugar, she writes, “does not just make us fat; it can also make us sick.” In other words, when it comes to the battle against obesity and diabetes, sugar is enemy number one.

¹ <https://www.cdc.gov/nchs/data/databriefs/db122.htm#x2013;2010>

² <http://www.diabetes.org/diabetes-basics/statistics/?loc=db-slabnav>

³ Schmidt LA. “New Unsweetened Truths About Sugar.” *JAMA Intern Med*, vol. 174, no. 4 (2014):525–526. doi:10.1001/jamainternmed.2013.12991


Alternative Media

It merits noting that the sugar experts implicate in poor health is *not* the sugar found inherently in fruits and dairy. It *is*, however, the sugar—or the sucrose, high-fructose corn syrup, honey, molasses, coconut sugar, agave syrup, evaporated cane juice and fruit juice concentrate, to list a few of sugar’s pseudonyms—that’s virtually impossible to escape in contemporary processed foods or beverages, whether they’re demonstrably sweet or not.

And it’s this inescapable sugar that’s produced a paradigm shift of its own in how the culture views sugar as an ingredient. State and local governments are increasingly imposing levies on it—usually in the form of soda or “sugary beverage” taxes—while activists propose that we more tightly regulate, if not outright ban, it. In response, food and beverage manufacturers are on the hunt for alternatives.

For decades, those alternatives ran mainly to “artificial” or “chemical” sugar substitutes like saccharin, aspartame, acesulfame potassium, cyclamates and sucralose—all of which presented drawbacks in terms of taste, cost, stability and consumer perception. Conflicting studies left the impression that such substitutes were either toxic or carcinogenic, as well—a perception that’s become reality regardless of its actual validity. But more alarming than that, perhaps, is recent research indicating that artificial sweeteners may be ill advised less for any purported toxicity⁴ than for the damage they do to a healthy gut microbiome⁵.

Along with “artificial” sweeteners, sugar alcohols like erythritol, maltitol and sorbitol have also stood in for sugar, and while they enjoy a more “natural” reputation than the likes of saccharin and cyclamates, they, too, have shortcomings, including a laxative effect at higher levels, a glycemic index in some cases close to that of sugar and an aftertaste that some consider unappealing or even “chemical.”

| | Sugar Free | Chemical Free | Pre-biotic | Sugar Like Flavor |
|---|---|---------------|------------|-------------------|
| 1 st GENERATION (chemicals) | NO, Contain all kinds of sugars | NO | NO | NO |
| 2 nd GENERATION ("naturals") | NO, Contains Sugars/Sugar Alcohol (Erythritol) | YES | NO | NO |
|  ® | YES | YES | YES | YES |

The Holy Grail of Sweeteners

So what are conscientious food manufacturers to do? They want to make a good-faith effort at lowering sugar levels in their formulations; but with today’s consumers as concerned about clean labels as they are about cutting sugar, any attempt to do so using an artificial or otherwise suspect sweetener will in itself introduce new liabilities.

⁴ <https://www.nytimes.com/2015/07/28/upshot/the-evidence-supports-artificial-sweeteners-over-sugar.html>

⁵ <https://www.scientificamerican.com/article/artificial-sweeteners-may-change-our-gut-bacteria-in-dangerous-ways/#>

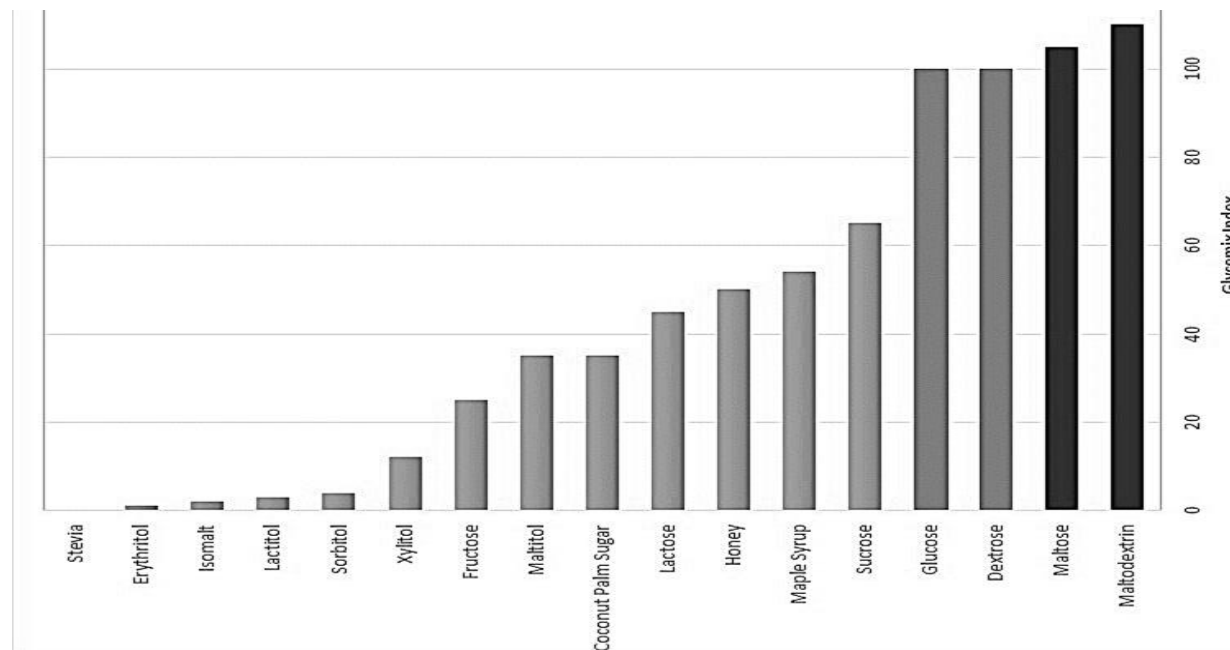
“It’s a conundrum that’s set industry on a search for the sweetener ‘holy grail,’” says Yuval Maymon, CEO and founder of Unavoo. “We need a sweetener that tastes as good as sugar, is natural and contributes nearly zero calories. And for a long time that perfect combination seemed impossible to find.

Maymon should know. Once something of an ice cream mogul, Maymon owned and operated as many as 50 shops worldwide dedicated the sweet treat when he received his own diabetes diagnosis nine years ago. That’s when the need for a truly healthful sugar alternative hit home with him. Thus Maymon, an investigator and inventor at heart, made it his mission to find that ideal sweetener—or, if he couldn’t find it, to develop it himself. And he founded a food technology company called Unavoo for the purposes of doing so.

South American Solution

Maymon’s search led him first to stevia, an extract of the *Stevia rebaudiana* plant, which has seen use in South America as a natural high-intensity sweetener for hundreds, perhaps thousands, of years. Taken from the plant’s leaves, stevia extract contains steviol glycosides, compounds that produce a sweet sensation 200 to 300 times that of sugar. Evidence suggests that steviol glycosides trigger the tongue’s taste receptors, signaling both a sweet taste and bitter aftertaste to the brain.

Just as important, stevia extract has zero calories, a glycemic index of zero⁶ and a record of safe consumption among diabetics. In fact, a 2011 review⁷ found that replacing sugar with stevia sweeteners may benefit diabetics, children and consumers looking to reduce their calorie intake. Stevia has also been deemed safe for use in most food and beverage categories across most developed countries; FDA grants high-purity stevia glycoside extracts generally recognized as safe (GRAS) status in the United States, for instance.



⁶ <http://www.glycemicindex.com/foodSearch.php>

⁷ Goyal SK et al. “Stevia (*Stevia rebaudiana*) a bio-sweetener: a review.” *Int J Food Sci Nutr*, vol. 61 no. (February 2010): 1–10. PMID 19961353. doi:10.3109/09637480903193049

And after examining long-term studies, the World Health Organization' (WHO) Joint Experts Committee on Food Additives approved⁸ an acceptable daily intake of steviol glycosides of as much as 4 mg/kg of body weight. "So, unlike many other sugar substitutes out there," Maymon says, "stevia is one that consumers and industry can actually feel good about—and can trust."

Corrective action

But how does it taste? While stevia does produce a high-intensity sweetness, some of its steviol glycosides—rebaudioside A, or Reb A, for example—strike the palate as sweeter than others, like the glycoside stevioside. Further, Reb A produces the least bitterness of stevia's constituent glycosides—which matters, because if there's one thing that's held back stevia's breakout as an alternative sweetener, it's what some critics characterize as a bitter, metallic aftertaste.

"What's more," says Maymon, "stevia doesn't have the mouthfeel properties of sugar." That discrepancy creates a different overall sensory experience—taste, texture and flavor perception—in stevia-sweetened products than in sugar-sweetened ones. "So we knew that if we wanted to develop an ideal stevia sweetener, we would have to pair stevia with another functional ingredient to correct for these challenges."

While other companies have turned to sugar alcohols, maltodextrins, artificial sweeteners or even sugar itself to attenuate stevia's drawbacks, Maymon and the Unavoo team knew that doing so would "defeat the whole purpose" of developing an all-natural, low-calorie, non-glycemic sugar alternative, he says. So they turned instead to prebiotic dietary fiber as their carrier, knowing both that its naturally mild sweetness and ability to bind water would improve stevia's sensory profile, and that its health benefits would complement stevia's clean reputation.

Revolutionary Formulation

The resulting stevia-fiber sweetener blend goes by the name HEYLO, and "it's like no other stevia-based sweetener out there," says Dorit Rozner, PhD, chief technology officer for Unavoo. "Consumers increasingly eye sugar alcohols warily, and almost everyone has soured on synthetic sweeteners. So a clean, well known prebiotic dietary fiber, used in a sweetener for the first time, was a much better choice for creating a synergy that feels like sugar and blocks the off tastes, bitterness, acidity and metallic notes that plague other stevia sweeteners. The fiber coating of HEYLO as well as the specific ratio of fibers and stevia create HEYLO's great taste profile with no off flavors and bitterness".

And unlike artificial sweeteners, HEYLO's prebiotic carrier actually benefits the gut microbiome, while also contributing to feelings of satiety that can help consumers better control their appetites. Notes Maymon, "That's often just what people hoping to cut back on sugar want to do." Given that the sweetener's fiber component may also help lower blood sugar and improve digestion, the entire blend "has beneficial health and physical properties that you don't find in other sugar substitutes," Maymon concludes.

Get to Work

Working with HEYLO also couldn't be simpler, Rozner continues. "It won't change a formulation's viscosity, density or pH, and it's extremely stable under most processing and storage conditions. And in the finished product, it's very hard to note a difference between the sugar-containing original and the one sweetened with HEYLO."

In the coming year, Maymon, Rozner and Unavoo expect to see the sweetener in a number of product launches that they believe will significantly disrupt how consumers think about and use sugar substitutes. Ketchup, jam, spreads, chocolate, flavored water, ice tea, lemonade, cookies and a number of other

⁸ ["Joint FAO/WHO Expert Committee on food additives, Sixty-ninth Meeting" \(PDF\). World Health Organization. 4 July 2008.](#)

applications—including Maymon’s favorite, ice cream—have all been road tested and are just waiting for further development.

No wonder ED&F Man invested in Unavoo and its HEYLO sweetener. A global agricultural commodities merchant trading in coffee, animal feed, grains, pulses, molasses and, yes, sugar, the company serves customers with broad needs in the sweetener market. “So along with sugar, we offer a number of alternative sweeteners to our customers,” says Jonathan Hugh, manager director, Agri-Industrials Business Division at ED&F Man. Among those alternatives, he says, “Unavoo and its novel sweetener stands out as having true potential because of its taste and mouthfeel, and the fact that it’s free of chemicals and artificial components. This is what consumers want and are willing to pay for.”

It’s also no wonder the Unavoo registered a worldwide patent application for HEYLO: with a continuing focus on food labels, regulations and taxes inevitable, demand for stevia will only rise. An independent Technavio report predicts the global stevia market to grow at a CAGR of 8.82% during the period 2016-2020, with growth in developed markets, where natural sugar reduction is prized, set to look especially promising.

Indeed, says Maymon, “In more developed regions, stevia is the natural sweetener that’s shown the most growth in demand over the last decade.” His hunch—and that of Unavoo’s investors Jonathan Hugh—is that stevia will do for developed sweetener markets what renewables have done in the energy sector. “Yes, stevia’s market share may be modest right now”—hovering around 1.5% in the US—“but as companies around the world launch products that replace sugar with stevia, we’ll see the curve moving even more upward and to the right.”

ⁱAbout the Author

Kimberly J. Decker is a Bay Area food writer. While her love of eating led her to study food science at U.C. Davis, her love of the written word prompted her to minor in English. Since then, she’s worked in product development for the frozen sector and written about food, nutrition, and the culinary arts, getting her hands into everything from cookbook projects for local chefs to corporate communications and regular appearances on the pages of industry journals.

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