# The sweetest taboo

## The negative effects of sugar can include a lifetime of brain fog

By Bill Giebler

In 2014, both Coca-Cola and Pepsi introduced their green can sodas, "Life" and "True" respectively. The sodas made two moves, in parallel. Firstly, they replaced high-fructose corn syrup with cane sugar as the primary sweetener—a move encouraged, no doubt, by the popularity of the cane sugar-sweetened Coke bottled in Mexico and the growing perception of sugar as the latest in natural sweeteners. Secondly, they reduced the total sugar by over 35 percent by adding stevia.

A healthy cola at last? Maybe not. This less unhealthy beverage may, in fact, capture a more health conscious consumer, but a 12-ounce can of the stuff still contains close to 5 teaspoons of sugar (4.8 in Coke, 5.2 in Pepsi). And a Google search of the most popular fast food menus suggests that neither soda is passing through America's drive-through windows. So, a Burger King cheeseburger value meal with a large Coke is indeed a whopper of a sugar bomb, with nearly a half cup of the stuff.

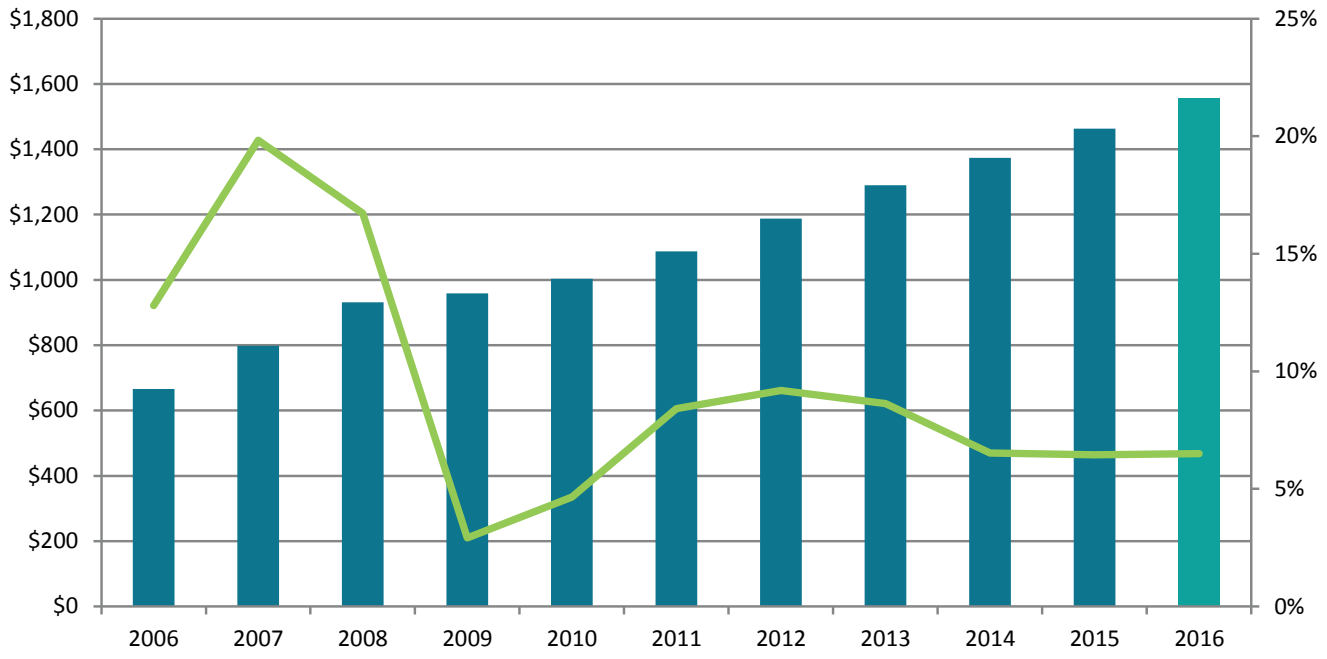
The effect is well known at the waistline, less so above the neck. But a chorus of experts say sugar's impact on the brain deserves more notice.

### NBJ Takeaways

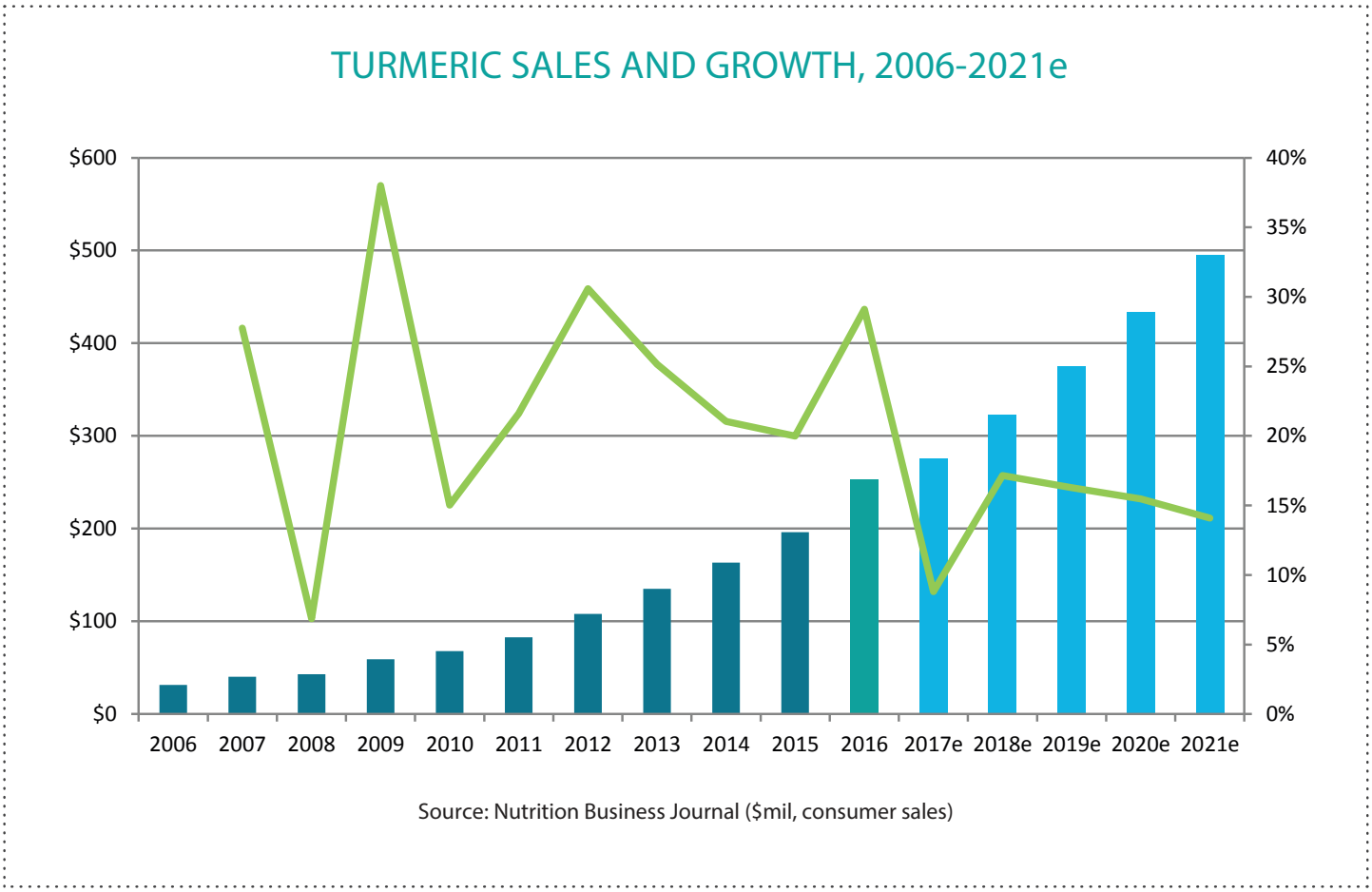
- Sugar awareness is growing, but American's still consume way too much
- Runaway sugar consumption leads to long-term cognitive disorders
- Botanicals are critical for addressing inflammation and oxidative stress caused by poor diet

For many consumers, the day starts with sugary cereals, each lunch features a soda,

DIABETES SUPPLEMENTS SALES AND GROWTH, 2006-2016




Source: Nutrition Business Journal ($mil, consumer sales)




and by the afternoon slump it's Snickers that really satisfies. Then white bread and dessert accompany most every dinner, contributing to why 1.4 million Americans are freshly diagnosed with diabetes each year, bringing the latest American Diabetes Association count to 29.1 million Americans living with the disease with another 86 million prediabetics in the wings.

Indeed, the average American consumes a stunning 140 pounds of sugar each year, says Dr. Jacob Teitelbaum, a board-certified internist and author of *The Complete Guide to Beating Sugar Addiction*. Diabetes isn't the only condition sprouting from this dietary habit. Sugar plays a key role in cognition and mental clarity, too—for better and for worse.

"Sugar is the only fuel that the brain can use," Teitelbaum says. "It's kind of like gasoline in the car. So, on one level when you have something sweet, it picks up the brain energy and you'll feel clearer." Unfortunately, at high levels, "the sugar becomes like a loan shark for mental clarity. Initially your mind is going to feel clearer, then you're going to feel anxious, and then your mind will get fuzzy."

Teitelbaum describes the blood sugar ride as involving a misguided release of insulin, too much for too long, based on the intake of processed sugar. "The body has never seen that in human history," he says. "As far as the body is concerned, it sees this sugar peak and says this person just ate a horse, and pours out insulin for three hours"—almost six times the duration needed for metabolizing simple sugars. The excess insulin production can contribute to metabolic syndrome, insulin resistance, a burnout of insulin production, and a rise in glucose to diabetic levels.

## The brain on sugar

"One of the most irritating things in the world to the inside of your blood vessels is sugar," says Cheryl Myers, chief of scientific affairs and education at **Europharma**. This irritation creates inflammation which in turn causes cracking and damage. Chronic inflammation, she says, has been correlated to major depression. "They've also found that people who have major depressive disorder have much higher rates of Alzheimer's disease. So, setting up the brain for a high inflammatory status makes it more prone to a whole host of different mistakes, including Alzheimer's disease."

"Alzheimer's is when the sugar can't get into the brain cell to be burned for fuel," says Teitelbaum. "It's been called type 3 diabetes, and it's an insulin resistance where the sugar can't get into the brain cells so the cells are starving." Eating more

## Making the medicine go down

When it comes to sugar and the brain, it's a love at first sight. The sweet caller excites the other, immediately bringing clarity and energy. But sugar is a fickle lover. Less than an hour later, the love affair is over, and the grey matter is left confused, fuzzy and anxiety-ridden.

We've all had relationships like that.

With sugar fueling not only these moment-to-moment swings but long-term cognitive decline, too, it's surprising to see the persistence of sugar as a delivery mechanism for supplements—even brainy ones.

To get a market insider view, we went to someone who's taken it even further. Andrew Goldman, MD, is co-founder of **Good Day Chocolate**, purveyors of supplements in the form of tasty candy-coated chocolates. Marketing them as "chocolate with benefits," these are the meeting place of treat and supplement.

» Why chocolate?

Goldman: Initially, I was looking for better delivery mechanisms for functional ingredients. I felt that the traditional absorption pathway through the stomach (pills, capsules, drinks etc.) is inefficient—you have to take higher doses of something to get through the liver's filtering process in order to get the desired function. The oral absorption pathway, leveraging the mucous membranes of the mouth, tongue and throat, in general is more efficient and vastly underutilized. This route of delivery bypasses the "first pass effect" of the liver and allows the functional ingredients to gain access to the vascular system (and consequently the body) faster and at lower dosages. Chocolate is a natural fit and allows at least a portion of our functional ingredients to be absorbed by this mechanism. Of course, I should mention the obvious, that chocolate is universally loved, and this was also an attractive component.

» What do you say to critics of the "candification" of supplements?

Goldman: I have never been a fan of gummies, or chalky chewable sweet tablets, and feel that sorbitol-based sugar products are unhealthy, plain and simple. There is only sugar and more sugar in those products. Chocolate, on the other hand, is a whole food. There are many components in chocolate (theobromine, bioflavonoids, etc.) that have healthful benefits, including being anti-inflammatory and anti-oxidant in nature. The overall effect is that chocolate itself counter-acts and lessens some of the negative impacts of sugar. Additionally, we are trying to satisfy the desire for something sweet simultaneously with the functional benefit. This marriage of function to the delicious treat is designed to help people control their sugar intake because they are eating chocolates based on a desired dose, and not just consuming the whole package.

» What about the potential stimulating effects in products intended for calm and sleep?

Goldman: While chocolate does have some natural stimulant ingredients (like small amounts of caffeine), these effects are counterbalanced by the relaxing/vasodilating impacts of theobromine and the natural mood elevating qualities of chocolate in general. We use a milk chocolate formula in our Sleep and Calm products to minimize the stimulatory effect and have found that the melatonin in our Sleep product, and L-Theanine in our Calm product, can function beautifully in this format.

sugar won't help, Teitelbaum says.

"When we put this all together," says Myers, "the most important things we can do for brain health are to get our blood sugar levels back to a more reasonable level so that you're not causing that up-front damage that triggers this cascade of events in the first place, and get that inflammatory and oxidative stress down. If you can do both of those things, you can have some tremendous impact on prevention."

To do that, Myers recommends curcumin, and specifically Europharma's CuraMed. The formulation combines a high-absorption curcumin with the synergistic effects of turmeric essential oil. The company now has four published studies showing CuraMed's efficacy for major depressive disorder, including one where it compared favorably to fluoxetine, the generic of Prozac. In fact, it worked as well as the pharmaceutical, Myers claims, without the adverse effects.

Myers says CuraMed, being both a potent anti-inflammatory and antioxidant, works well against diabetes. It does this in a host of ways, including blood sugar control, improvement in insulin resistance, reduction of inflammation in the pancreas that takes place in type 2 diabetes, and even some evidence in animal studies that it helps to dissemble beta-amyloid, the plaque-forming proteins associated with Alzheimer's.

"When you look at the many touchpoints that can play a role in developing problems with brain health, curcumin touches each one," Myers says.

For more immediate management of blood sugar levels, Myers points to Europharma's SucOntral D, formulated around the neoflavanoid coutareagenin from the botanical *Hintonia latiflora*. "Some of the clinical studies done in Germany show that it can reduce fasting blood sugars by 23 and 24 percent and it can reduce hemoglobin A1C by 11 percent," Myers says. "It can make some real measurable differences." And unlike blood sugar medications that can take blood sugar too low, there's not been a case of hintonia causing hypoglycemia.

Why? Myers isn't certain, but suspects it's because coutareagenin doesn't directly take sugar out of the blood stream. "What it does is help with some of the body's mechanisms for coping with sugar," she says. "It helps to reduce insulin resistance. It slows how quickly sugar is metabolized."

Another polyphenol of note is Oligonol from **Amino Up Chemical** in Sapporo, Japan. Oligonol is a branded polyphenol showing broad spectrum impact on blood flow, metabolic syndrome and even skin conditions.

Derived from lychee fruit, Oligonol is modified to have a low-molecular weight, "making the bioavailability absorption of this compound three to four times better than original lychee fruit polyphenol," says Kohei Homma, PhD, senior R&D manager for the company.

Aging is oxidization, Homma says. "Our body gets rusty. Oligonol works as a trigger to turn on those antioxidant enzymes we naturally have in our body. So, Oligonol is not working alone, our intrinsic antioxidant capacity is also being improved."

In a recent animal model study looking at the effect on diabetic mice, Oligonol acted as an insulin sensitizer and reduced blood sugar levels, Homma says. "And because of an anti-inflammatory effect and antioxidant effect that's related to this kind of Alzheimer's or dementia, reduction of these disorders is a kind of indirect benefit we can expect. But we only have limited scientific evidence thus far."

Additional animal studies suggest improvement of cognitive impairment with Oligonol, and recent human trials indicate improvement in fatigue and depression.

## The basics

Lifestyle is the starting point for most. Regular exercise, for instance, has been shown to be more effective than antidepressant drugs in improving mood, mental clarity and cognitive flexibility. Basic nutrition plays a large role in all of this, too, starting with the elimination of empty calories. "Do you want to eat a piece of chocolate every now and then because it's dee-licious?" Myers asks. "Well, that's one thing, but do we really need sugar in our barbeque sauce? Do we need sugar in our salad dressing? Do we need sugar in our bread? All of these hidden sugars are really unhealthy for us."

"Because 18 percent of our calories come from sugar, which has no vitamins and minerals to speak of, we're losing almost one-fifth of the vitamins and minerals that should be in the diet," Teitelbaum says. Add in other refined carbs, like white flour, and it's more like half of the vitamins and minerals missing from the diet.

One such vitamin is folic acid. "Studies show that the vitamin folic acid plays a bigger role in causing or preventing Alzheimer's than any medication available," he says. "Dramatically more effective. That's reason 8,722 to take a good multivitamin."

But, contrary to the popularity of carb restricted diets, elimination of sugars outright is not the dominant recommendation. It's just a matter of where we're getting those sugars. And fruit, the greatest source of natural, unprocessed sugars is also the source of many flavonoids and polyphenols. In fact, Teitelbaum says, there's no problem at all with sugar from whole fruit. "Let's talk numbers," he says. "If you eat an orange, that's two teaspoons of sugar. If you have 16 ounces of orange juice, that's 12 teaspoons of sugar. If you want to sit down and eat six oranges in a sitting, go right ahead, I'll just sit there and laugh at you." Even so, he adds, "with the oranges you'll be getting all the fiber, so it gets absorbed slowly which is the healthy way for the sugars to come in." Bottom line, says Teitelbaum: "Enjoy your fruit, fruit is healthy. Just don't drink fruit juices."

While reduced calorie soda will not solve our nation's sugar addictions, no matter how green the can, it's an indicator that the American diet is changing in small, slow steps. Elimination of sugary drinks (and processed carbs) altogether and an increase in exercise is a critical starting point for many. To reverse the damage, consumers could benefit from the several nutrients and botanical ingredients presently showing promise in reducing inflammation and oxidative stress and moderating blood sugars.

Those products might not be an antidote to the ubiquity of sugar in the American diet, but one thing is clear, we're better off reaching for a supplement than a sugar cube.

## FUNctional beverages

A short history of functional beverages—which are oft lauded as healthy alternatives to sugar-laden sodas—would indeed have to start with sodas themselves. Many of the enduring soda varieties, and even brands, were created behind the pharmacy counter, yet both the medicinal benefits of these beverages and the soda fountain are distant memories.
Here's a look at what these were before they became sugar water:

- Root beer, originally a mildly alcoholic concoction, began appearing in pharmacies in the mid-1800s. Billed as a cure-all, the beer featured a blend of diuretics, blood cleansers, digestives and pain relievers in the form of botanicals like sassafras, sarsaparilla, licorice, wintergreen and birch. Hire's, the first commercial brand, contained 25 herbs, roots and berries.
- Dr. Pepper was the first soda brand to be a commercial hit. Not the prune juice-based beverage it's often rumored to be, it was originally marketed as a brain tonic—though the recipe has been a long-held secret.
- Coca-Cola went to the hard stuff for its stimulant effect. Cocaine (or at least an extract of the coca plant) played a role countering the wine originally serving as the base of the drink. Kola nut provided a bit of caffeine, too.
- Pepsi-Cola turned to the digestive aid pepsin for its formula, along with tasty and energizing kola nut.
- 7Up does not reveal what was originally behind the "up" in this tonic's name (or the "7" for that matter), but mood stabilizing lithium citrate helped keep imbibers spirits up.