**The Secrets of Sugar**

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95 teaspoons of sugar. That’s how much sugar Jonathan Breedon, his girlfriend and their two children consume on average in a day. That’s not from eating cupcakes and tubs of ice-cream--- but from a fairly typical North American diet.

Like most Canadians the Breedons have no idea how much sugar they’re consuming. [That’s because most sugar we consume is not added by the teaspoons in our coffee or over our breakfast cereal but hidden in processed food.](http://www.cbc.ca/fifth/sugarinthekitchen/)

In a can of Campbell’s tomato soup? More than seven teaspoons.

In a bowl of vanilla flavoured Activia yogurt? Almost fourteen teaspoons.

And the *Healthy Choice* chicken pineapple microwave dinner? 5 ½ teaspoons.

The average Canadian consumes 26 teaspoons of sugar per day. That’s 40 kilos a year--- the equivalent of 20 bags.

Emerging science is connecting the high consumption of sugar in North American diets with the rapid spread of chronic diseases such as cancer, heart disease and Alzheimer’s.

The food industry, which relies on sugar for most of its products, is one of the biggest manufacturers in North America. It generates nearly a trillion dollars in sales a year. But the nutrition labels on the back of the packages, don’t list a recommended limit to how much sugar people should consume in a day.

**Meet Dr. Bliss**

The food industry goes to great lengths to figure out what makes us crave a product--- the exact combination of ingredients it calls the ‘bliss point’.

“You know everybody asks what is the bliss point?” says Dr. Howard Moskowitz. “It’s Goldilocks, it’s the middle, it’s the best one. It’s the level where you like the product the most.”

Moskowitz is a long time food industry consultant. He has helped turn many products on the grocery store shelves into instant best sellers.

A Harvard trained mathematician, he uses a computer program to sift and sort through peoples’ reactions to different versions of a product, with varying degrees of sugar, fat and salt. Once he’s found their bliss point, it’s a slam dunk in annual sales.

“Everybody wants to sell just a bit more. How do you get that immediate increase in acceptance? Those in the know realize you can add a little sugar,” says Moskowitz.

**Is sugar toxic?**

In the 1980s and 90s a lot of health problems were blamed on dietary fat. But when we started taking fat out of our foods and introducing ‘fat free’ and ‘low calorie’ products in grocery stores, it didn’t reduce the number of people getting sick. In fact the rates just kept climbing.

That got a lot of doctors and nutritionists asking why. The answer – according to an increasingly vocal group – is sugar.

“Which was worse: the sugar or the fat? The sugar a 1000 times over,” says Dr. Robert Lustig.

Lustig is a pediatrician and medical professor and one of the leaders of the anti-sugar campaign. He became a [YouTube sensation](http://www.youtube.com/watch?v=dBnniua6-oM) when one of his lectures on sugar was seen by nearly four million people.

“The fat’s going down, the sugar’s going up and we’re all getting sick,” says Lustig. “This is not a hyperbole, this is the real deal. Everyone thinks that the bad effects of sugar are because sugar has empty calories. What I’m saying is no, actually there are lots of things that do have empty calories that are not necessarily poisonous.”

Poisonous, he says, because of what too much sugar does in our body.

Sugar is made up of two molecules--- one called glucose and the other fructose. They separate in our gut. The glucose circulates throughout our body feeding our muscles and our brain.

But the fructose goes right to our liver. It’s in that organ where all kinds of problems begin.

When you metabolize fructose in excess, your liver has no choice but to turn that energy into liver fat and that liver fat then causes all of the metabolic diseases such as cancer and heart disease.

**Why do people eat too much?**

If you eat too much and don’t exercise enough you will get fat. That’s the message that’s been drummed home to everyone, including to the Breedon family.

Dr. Lustig says too much fructose, shuts down the part of your brain that tells you when you’re full.

Phyllis Tanaka speaks for the largest industry association that represents food companies in Canada--- the FCPC. She doesn’t buy Lustig’s theories and doesn’t think consumers should either.

“I think there’s a long way to go before the literature is sorted out,” says Tanaka.

**Food industry insider warns of ‘national epidemic’**

But documents obtained by *the fifth estate* show that the food industry has known – and discussed -- how the potential links between processed foods and diseases for a long time.

Fourteen years ago, about a dozen of the most powerful heads of food companies in North America, including Coca Cola, Kraft and Nestle Canada gathered in an auditorium on the 31st floor of the Pillsbury headquarters in Minneapolis on April 8, 1999.

They were attending a dinner that took place every two years for food industry titans. This was the first year obesity was the focus for the presentation that preceded the dinner.

Michael Mudd, at the time the VP of communications at Kraft, made the presentation. He warned the food executives that if they didn’t do something to curb obesity, they would be facing lawsuits down the road.

As he spoke, slides demonstrating the link between processed food and diseases such as cancer and heart disease are presented overhead.

Tobacco companies had recently settled a massive lawsuit in the face of evidence that their product caused disease. Did the food industry, he asked, want to be next?

“If anyone in the food industry ever doubted there was a slippery slope out there, I imagine they are beginning to experience a distinct sliding sensation right about now,” [Mudd tells the audience.](http://www.cbc.ca/fifth/blog/food-industry-insider-warns-of-national-epidemic-of-obesity)

According to New York Times reporter Michael Moss, who wrote a book that looked in part at [Big Sugar](http://www.amazon.ca/Salt-Sugar-Fat-Giants-Hooked/dp/1400069807) , the CEO of General Mills, Stephen Sanger, was livid with Mudd and refused to participate in his proposal for food companies to pool money to tackle the rise in obesity.

14 years later in March of 2013 Mudd would go on to write a [scathing editorial](http://www.cbc.ca/fifth/blog/how-to-force-ethics-on-the-food-industry) slamming his former colleagues in the food industry. After years of trying to encourage them to take some responsibility for the health crisis in North America, he publicly broke his silence for the first time in the New York Times editorial.

Mudd wrote, “The industry is guilty because it knew what the consequences of its actions might be… It’s time to end the charade and mandate the needed change that the industry has refused to make.”

**Can sugar make you sick?**

After decades of silence, there is new scientific research linking the increase in sugar consumption to all kinds of chronic diseases such as cancer, heart disease and Alzheimer’s.

Dr. Robert Lustig from San Francisco has studied diabetes in 175 countries.

“When you adjust for all the factors we know are relevant, what about the food supply predicts diabetes rates worldwide?” asks Lustig. “Answer: sugar and only sugar.”

Nutrition researcher Dr. John Sievenpiper argues Lustig’s methodology is seriously flawed.

“A lot of other things have happened at the same time,” says Dr. John Sievenpiper from St. Michael’s hospital in Toronto. “Over the same time as sugar has gone up, so has bottled water, but there's no real biological plausibility in the link between bottled water and overweight and obesity so it's not a, I don't think, a sound finding … we have to be careful in putting too much of the biologocial plausibility in wanting to believe patterns that we see.”

He stresses that there are so many variables that can cause a disease, it’s impossible to nail down a specific cause. And ethically one can’t induce disease to find out.

But you can test for markers--- warning signs that disease may be coming. And that’s what they’re doing at the University of California at Davis.

Students are being used as guinea pigs as scientists are feeding them sugar in drinks to figure out if it raises the markers for heart disease.

Every time they’ve run their blood tests, Dr. Kimber Stanhope says the results have been the same.

“In two weeks we see increases in the risk factors for cardiovascular disease in the blood,” says Stanhope.

But those kinds of studies don’t impress everyone. After surveying a number of studies, including Dr. Stanhope’s, Sievenpiper sees no reason for alarm.

“What we find when we look at those trials very carefully is that as long as you match for calories, fructose does not behave differently than does any other form of carbohydrate, namely starches or refined starches and glucose. Now that's not to say that they're benign, because I don't think we should be having a lot of refined starches or glucose. But it's not behaving any differently.”

Stanhope can’t speak to the other studies but says she has tested different types of sugars on her test patients and it is only fructose that causes the problems.

“If I had results as strong with regard to a food additive, a brand new food additive, and then I started producing these results? That additive would get pulled pretty quickly,” says Stanhope.

Stanhope isn’t the only researcher raising the alarm about sugar.

Dr. Lewis Cantley who heads the Cancer Center at New York’s Weill Cornell Medical College has been so frightened from his research that he’s abandoned almost all sugar consumption.

“I think that eating too much sugar can definitely increase probability of cancer, and also make the outcome of people who have cancer worse.’

Dr. Suzanne de la Monte from Brown University wants us to add dementia to the growing list of diseases blamed on high consumption of added sugar.

“Insulin resistance, we now know, can occur in any organ. It can occur in the muscles--- that’s what diabetes is… And it can occur in the brain, and we think that’s Alzheimer’s.”

De la Monte has done her research by feeding healthy rats the equivalent of a North American diet, complete with all the sugars and fat. All her rats ended up demented.

Despite this emerging research, associations on both sides of the border for Alzheimer’s, cancer, diabetes and Health Canada and the FDA have refused to link sugar and disease. But there is one important group that is raising the alarm.

The American Heart Association now recommends that people that cut back on added sugar dramatically. Women should have no more than six teaspoons a day, men nine.

And yet the Canadian food industry remains unimpressed.

“At this point in time, I’m comfortable saying that the science just isn’t there to support a role in chronic disease,” says Phyllis Tanaka.

**New laws for sugar**

So for now, processed foods continue to remain on grocery shelves with no recommended daily limit for sugar by Health Canada for Canadians. This despite being required to list limits for other ingredients such as salt.

Health Canada declined numerous requests by *the fifth estate* for an interview but former Health Canada employees did speak off the record, saying the department does not believe there is any need to add a recommended daily limit for sugar on food labels in Canada.

In the U.S. there are many groups pushing hard for changes in the law that will force food companies to clearly label grocery products with a suggested safe amount for added sugars.

The most recent legal effort was made in September by Congressman Frank Pallone, Congresswoman Rosa DeLauro and Senator Richard Blumenthal. They announced the introduction of a bill that they say will improve food labeling. If passed, it will make it clear on nutrition labels how much of the sugar content is from added refined sugars and how much of it is from natural sugars.

The bill also pushes for less ‘deceptive’ food labeling.

“You shouldn’t need the skills of a CIA code breaker to understand food labels,” says the executive director of the Centre of Science for Public Interest

**Moment of Truth for the Breedons**

In early September researchers from *the fifth estate* cleaned out [the Breedon family’s](http://www.cbc.ca/fifth/blog/who-are-the-breedons-and-how-did-they-lose-inches-from-their-waist-line-in)refrigerator and cupboards of food. The family of four was then provided with all of their meals prepared by professional chefs.

They were encouraged to eat as much as they desired, told to feel free to add any salt or butter to their food, and to not take up exercise since they normally didn’t do so. These measures were taken to reduce the chances of any change in the family’s health being attributed to factors other than eliminating added sugar from their diet.

The only instruction given to award-winning [Chef James Smith](http://www.cbc.ca/fifth/blog/chef-james-smith-teaches-ana-ortiz-how-to-make-pizza) and meal delivery company[Today’s Menu](http://www.todaysmenu.ca/) was to eliminate any added refined sugar from their recipes.

Now with the three-week experiment over, the moment of truth has arrived for the Breedons.

Did cutting out sugar from their diet for three weeks have an impact on their blood work?

The results show that Jonathan Breedon has lost one-and-a-half inches around his waist and eight-and-a-half pounds. Ana’s weight is down too and her waist, where all that dangerous fat can accumulate, is down by five inches.

While our three-week experiment is far from scientific proof of anything, the doctor who tracked their blood tests was very pleased. Jonathan’s cholesterol level has dropped by 10 per cent and his triglycerides by 20 per cent.

“I thought the change would be really little but to see how it dramatically changed. It means it is really good,” says Jonathan.