

# **THE MODEL HEALTH SHOW**

**EPISODE 553**

**What Would Happen To Your  
Body If You Quit Sugar For 30  
Days?**

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**SHAWN STEVENSON:** Welcome to The Model Health Show. This is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in with me today. How sweet it is. On this episode, we're going to be dissecting the metabolic impact that sugar actually has, some of the crazy history of sugar, and answer the all-important question of what would happen if you quit sugar? If you and sugar were to break up, what kind of metabolic changes would take place? Well, get your favorite break-up songs teed up because, in this episode, we're going to have a ton of eye-opening insights. First up, let's take a look at the current state of sugar consumption versus generations of the past. In the 1700s, the average Westerner was consuming about four to six pounds of sugar each year. Today, the average American consumes more than 10 times that amount. Data published in the peer-reviewed journal, *Advances in Nutrition*, states that the average American now consumes 80 pounds, 80 pounds of added sugar every year. What are the metabolic ramifications of this? The literal fuel that we're using to run the human body has changed dramatically in recent decades. The fuel that we're using to run functions, and also what's making our tissues, is dramatically different. The very ingredients that make up human tissues and run our bodies, is dramatically different. So, what is happening? What's taking place?

Well, one of the things that's most noted in the peer-reviewed evidence is the correlation with sugar consumption going hand-in-hand, like a couple, like a couple's retreat or a couple's vacation, with the rates of obesity skyrocketing, and also this new phenomenon, something called diabetes, with these increased rates of diabetes, well noted to be a dis-regulation of the body being able to handle sugar, which we're going to dissect more today, and also going hand-in-hand with obesity. Here in the United States right now, we're knocking on the door of about 250 million of our citizens being overweight or obese. Something shifted dramatically in the 1980s with our sugar consumption, processed food consumption, and a new sugar being added to the mix, being high-fructose corn syrup, in great quantities.

Now, we're going to be talking about all these different things, because high-fructose corn syrup is a little bit more of a recent invention versus sugar itself, which has a history that dates back much, much further. In fact, we're going to have to go back thousands of years. Human physiology evolved on a diet containing very little sugar. So, we're talking about over the span of hundreds of thousands of years, and virtually no refined carbohydrates. In fact, many experts feel that sugar probably entered into our diets by accident. Yet, humans have actually sought out sweet things since our earliest days of evolution. Just because we didn't have access to highly refined carbohydrates and sugar, did not mean that we didn't have a primal desire for them. Evolutionary biologist at Harvard University, Daniel Liberman, says that "Sugar is a deep, deep ancient craving." Sweetness in nature signified some very specific things for human

biology. Sweet has a very specific signal for certain data points, like, sweet signals a dense source of calories, i.e., potential energy, if we're looking at, again, evolution, evolutionary biology, and what our bodies would associate with that sweet flavor. Plus, sugar offers more than just energy, it also helps you to store fat, too.

There was a time in our evolution, a massive span of time, when hanging on to some extra fat was a huge advantage, and not necessarily a health risk. And this was thanks to a mutation that up-regulated sugar being stored as fat to help to ensure survival of our species. So again, there's a natural primal desire towards sweet things, knowing that it's a dense source of caloric energy that can then get converted into fat on our bodies because our bodies aren't necessarily storing that much in the form of carbohydrates, because that glucose that sugar is going to get converted to, can get stored as glycogen in our muscle and in our liver, but that's pretty much it. The amount that we can carry is minuscule compared to the amount of fat that we can carry. This is why this adaptation, we had a mutation occur, where we can get that sugar to get stored as fat more easily. Now, keep in mind, this is a time when sweet food was much more scarce, and food, in general, could be inconsistent and scarce. Keeping in mind that hunting was way less reliable, weather conditions, with gathering and things of that nature than simply walking over to your refrigerator.

Alright, so the conditions were very different. So again, sweet things in nature, like certain ripe fruits and honey were a virtual jackpot throughout our evolution. Though we've long had a desire for sweet things, we simply didn't have that much of an access to it. But, as you know, that would eventually change. When we shifted gears to the origins of sugar, as we know it today, it's mainly extracted from sugarcane and roots of sugar beets. Originally, people chewed on raw sugarcane to extract its sweetness. Sugar was a native of tropical South Asia and Southeast Asia, and different species seem to have originated from different locations in India and Africa. In fact, my wife being from Kenya, she told me stories about when she was a kid. They would actually chew on sugarcane. And it was not just for the nice little sweet extraction that they would be able to get, but it was to strengthen their teeth. Because that chewing work, of course, we don't really think about this, but the process of chewing, just like the bones of your body... You're going to get stronger bones if you're doing weight-bearing exercise, so that mechanical action strengthens the teeth as well. We tend to think that that sugar that might be coming from the sugarcane is going to degrade the teeth, but it's actually quite the opposite.

And it's a much smaller amount that's going to be extracted than a cookie or whatever the case might be, a concentrated form of sugar, and also that action of chewing on something which has been largely pulled away from our diets today for our children and wondering why our teeth are not coming in properly and the vitality of our teeth, our teeth being able to be robust and resilient has degraded over time as well, and now we just have soft everything.

Most of the stuff that we eat is soft, very chewable, you can almost swallow food. If we think about even things that have a little bit of crunch to them, like highly processed foods in the form of potato chips, for example. You get a couple of crunches, then it dissolves into almost nothing, and has this phenomenon called vanishing caloric density that takes place, that essentially, our mind as we're crunching down on something, we're expecting some calories to come along with it, but it vanishes into almost nothingness. And so, the body is continuing to seek out the calories that it is expecting, driving us to eat more, and more, and more, and more. They use this label in marketing with these popular potato chips that you can't eat just one. That's not a joke. It is designed that way.

So, this goes back again to this root of sugar being sugar cane, but in its natural state, it's also going to contain a significant amount of vitamins and minerals. Vitamin A, vitamin C, several B vitamins, along with antioxidants and soluble fiber, copper, chromium, calcium, magnesium, potassium, and zinc. Now, that is the root of sugar as we know it today, but how did this transformation take place where we have what we refer to as refined table sugar? Well, the first chemically refined sugar appeared on the scene in India about 2,500 years ago. It was here that humans discovered the methods for turning sugarcane juice into granulated crystals that were easier to store and to transport. In the local Indian language, these crystals were called khanda, which I don't know if it sounds like a certain word, but this is actually, we're looking at etymology, the root of the word candy. This special sugar was found in Europe by the 1st century AD, but primarily as an imported medicine, not as a food. This is more of the paradigm of helping herbs and medicines to go down easier, sort of like that line from Mary Poppins, "just a spoonful of sugar helps the medicine go down".

Now, Crusaders brought sugar home with them to Europe after their campaigns where they encountered caravans carrying "sweet salt". Sugar was then considered a luxury in Europe until somewhere around the 18th century when it became more widely available. In fact, and this is really, really important. In 1319 a kilo of sugar, also called "white gold", went for two shillings a pound in London. This is the equivalent of about \$50 a pound in current dollars, keeping it a luxury item that few people below the richest class would have ever experienced in their lifetime. It's just like you see people now, they got the Bentley, they rockin' the Louis V. Back in the day, we were seeing people eating sugar like, "Man, I'm trying to get that new sugar. I'm trying to be on what they're on." But by the 19th century, sugar became extremely popular and even considered a necessity. This evolution in taste, because as this happened, our tastes evolved or devolved to constantly desire sugar, and that's not an accident. We're going to talk about why. And the demand for sugar was seen as an essential food product, unleashing major economic and social changes. Sugar was just one of the major drivers of colonization of tropical islands and nations where labor-intensive sugarcane plantations and sugar manufacturing could thrive.

The demand for cheap labor to perform the hard work involved in its cultivation and processing increased the demand for the slave trade from Africa. Cognitively for lots of folks, it's often tied to cotton plantations or tobacco plantations, but sugar production was a huge driver of slavery as well. And as the production increased and the quantities of sugar available dramatically increased, the price plummeted, and now it's become an everyday thing for lots of folks. Now, let's talk a little bit about how sugar is made, just a brief synopsis of it. So, we know that sugar cane is grown and then harvested, it's washed, and then it's crushed down, and the sugarcane juice is then extracted from the fiber. Now, this cane juice is then put through a clarification process to "remove impurities". Now, evaporation is then used to remove the water, and the remaining syrup then goes into a crystallization process where it's evaporated until it's saturated with sugar. Then, small grains called seeds are added. They serve as the nuclei for the formation of sugar crystals. Then, use a centrifuge, it's dried, and then ran through multiple straining screens to create a uniform sugar grain and remove any remaining by-products. Now, this glorious, sweet uniform sugar has taken over everywhere, and in fact, by May 1896, American Sugar became one of the original 12 companies in the Dow Jones Industrial Average.

So, this stock system that is a huge integrated part of our society. Sugar was right there, front and center. Now again, since sugar first became available really to the richest class of people, the consumption of the average person has gone up more than 10 times, and we're talking in the ballpark of about 80 pounds a year on average. Now, that's averaged out because some folks are only consuming five pounds while other folks are consuming 150, alright, so we've got to understand that the access has changed so much, it has become such a part of our culture and part of the issue today, and even addressing this topic is how can we villainize something that is so tied into our culture in so many ways?

If you think about what we give our child on their very first birthday, a little cupcake, or a little cake to celebrate. After, for example, the game, we take our kids and they have the soccer game, whether it's a win or a loss, going out and getting some ice cream afterward. And how do you show your love in our culture? On Valentine's Day, for example, we're extending a heart, with sugar, filled with chocolate and candies. Really, every holiday, if you think about, obviously, you've got a national holiday dedicated towards candy, which is Halloween, which again, you think about where's the root? How did that even happen? There's supposed to be some kind of spirit-related thing, but just like, "Give 'em candy." You know? And the same thing holds true for all of our other holidays, from Christmas cookies to all of the desserts at Thanksgiving... Even Easter, that's turned into another candy-related holiday. We've got the Cadbury eggs. Have you ever had a Cadbury egg? The chocolate-covered egg and inside is like this thick chalky gooey-ooey, whatever that is. If you've ever gotten through one of those, I commend you, and also, I'm afraid of you.

Alright. So, we've got that, we've got the marshmallow peeps, that's another one. If you're into the peeps, I don't know. Again, I'm going to be cautious around you, right. But they keep showing up, so somebody's eating 'em. So, all of these things in our lives revolve around sugar, revolve around our access. It's been turned into so many different out-picturing's of what sugar can be, that it's now become so integrated in our culture that we often don't even know that it's happened. So, the question is, after all of this progress, apparent progress, are we better off as a society? Well, in some ways we are, from a few hundred years ago, absolutely. But in other ways, if you look at our health as a species and you look at our functionality as a species, well, then the answer to that one would be a big fat no.

Now, it's time to get into how does sugar actually impacts our primary metabolic controllers? And I think that the conversation, which is often overlooked, should really start at that introduction point, the entry point for sugar to get into our bloodstream, and the majority of this is taking place within our gut. Data published in *Advances in Nutrition* uncovered that excess sugar creates a clear pro-inflammatory environment in our gut. There's even recent data from UT Southwestern Medical Center demonstrating that excess sugar's inflammatory activity can even intensify the risk for colitis, an especially difficult inflammatory bowel disease. So, when we say that inflammation is being triggered by our excessive consumption of sugar, this is not a joke, and this inflammation is really undergirding so many of our other downstream metabolic depressions that take place.

And this is starting to understand that when sugars coming into our system in such rampant amounts, that interaction is taking place in the gut. This is a primary point. This is the front line of interaction. This process, in and of itself, becomes dysregulated, then things can start to break down. It's kind of like a domino effect, and we'll talk more about that as we go along. Another study cited in *Science Translational Medicine* describes, through animal models, how sugar is likely making negative alterations to our gut bacteria.

Now, this is another critical thing for us to understand. Today, microbiome is one of the biggest parts of our lexicon if we're talking about health, and for good reason, it's wonderful that this part of our health is being talked about. Our microbiome is truly sort of like the soil from which our health is growing. It is really like this dynamic entity, we're talking about the trillions of bacteria that we're carrying, that we evolved to have this symbiotic relationship, where our gut bacteria would be making critical nutrients in us, for us, like SCFAs or short-chain fatty acids that are needed to heal and protect the integrity of our gut, that are needed for healthy cardiovascular function.

They're even impacting our brain, we now have some recent data, impacting our brain. We now have some recent data indicating how short-chain fatty acids are critical to the function of our nervous system. So, this interaction and the systemic impact that our bacteria have



cannot be overstated. It's so important, it's so powerful, but when dysbiosis takes place... When pathogenic bacteria, because we have a ratio. We have what we consider these friendly bacteria, and then we have opportunistic bacteria. They're taking advantage of you, alright, just like in life outside of our bodies, we've got friendly folks, or we've got some opportunists. Alright? And it's not that the opportunists are all bad. We got to have that clear. They might be missing something, there's a hole in their heart, you know?

They might have been through some stuff, it's not that they're necessarily even trying to hurt you. But they might not know how to act when they're allowed to run the show, but they have a purpose as well. Every person, every microbe has a purpose, so we just want things to be in balance, alright. So, dysbiosis takes place when the opportunistic bacteria begin, the ratios began to overpower the protective friendly flora. And I'm going to share with you a segment from my latest book, *Eat Smarter*, and this is addressing one of the most important things for a healthy metabolism, which is having a high diversity of microbes. A recent study published in the *International Journal of Obesity* revealed that a higher diversity of gut bacteria is directly correlated with less weight gain and improved energy metabolism, independent of calorie intake and other factors. This is yet another example of how two people can consume the same amount of calories, but one person gains fat while the other person does not. Your microbiome diversity plays a major role in how many calories you're extracting from your food. And it's also well-noted that certain bacteria are much more apt to absorb more from the carbohydrates/sugar calories in your food than other macronutrients.

Again, that's a segment from my best-selling book, *Eat Smarter*, and what we're looking at here are what we refer to as epi caloric controllers. So, we're talking about the things that actually control what calories do in our bodies. It's not just this very rudimentary view of metabolism as calories in calories out, alright. Calories absolutely matter, but it's looking at the human body as if it's some robotic calculator, and that's simply not the case. The human body is much more like a very dynamic chemistry lab that's going to have different outcomes based on the different ingredients. And part of the ingredients that determine how many calories we absorb from our food and how our bodies expend that energy, a big determinant is our gut bacteria, specifically the diversity of our gut bacteria. By breaking up with sugar, cue your favorite break-up song, or having it just be a small, tiny portion of your diet for the next 30 days, you will see a dramatic shift in your microbial cascade. One that is shifting over to a state that has a higher diversity, number one. And number two, because what we know is that sugar is going to be feeding preferentially this pathogenic bacteria.

And every bacteria has its preferred food source. And if you're not providing your friendly flora with their prebiotics, the things that they enjoy to keep them around and in high proliferation, then things are going to start to shift for the worst. So, we got to provide prebiotics, we've also got to pull back on the string of that rampant sugar intake that tends to happen in our

culture. And this shift is going to take place where we have the ratio if we just use two categories, two broad categories of bacteria firmicutes and Bacteroidetes. What's now indicated in study, after study, after study, is that Bacteroidetes are more associated with leanness, while the firmicutes are more associated with insulin resistance and weight gain. No, this is not a black and white issue, but we consistently see this. And so firmicutes are going to be more driven towards carbohydrate intake and sugar intake, so we're going to start to see a shift take place when we're pulling back on, particularly again, the added sugar. This is that... The sugar that is added to potentially whole foods, in addition to what's already there in the food naturally.

So, for example, we might have some naturally occurring sugar obviously in fruit or in some grain products. But then in that production process, turning it from a whole food into a heavily processed food, which here in the United States today, as of this recording, about 60% of the American diet is not just processed foods, but ultra-processed foods. 60% of the American diet is ultra-processed foods, alright. So, we already have the refined carbohydrates and then sugar added on top of that, that's the issue. So, this is what's going to happen when you break up with sugar, you could still be friends. Some people don't need to be friends though, okay. You just need to get them out your life, but if you're still going to be friends, still be cordial, making it a tiny percentage of your intake where again, we're talking about added sugars. Then we're going to have a mighty shift in our gut bacteria, that's going to then encourage our bodies to have a healthier association, in how it's shuttling energy into our bodies and also how it's being expended. Another power player in the scenario, and what would happen if you broke up with sugar has to do with the impact that it has on our pancreas, which is the production point for our body's insulin. Within the pancreas, you want to consider pancreas to be the mother of your fat storing and fat burning hormones, the twin brothers that we have are insulin and glucagon.

So, we've got the alpha cells in the pancreas that are producing glucagon, which is associated with the ability to unlock stored fat to be used for fuel. And then we have insulin, which is all about fat storage. Now, insulin is incredibly important, we would not be the people that we are without insulin. It's enabled us to survive as a species, it's enabled us to store energy in our tissues. Now, the thing is, it's really, really good at it. Insulin is coming along and providing essentially a big skeleton key to unlock the doors of our fat cells so that energy can get shuttled in. And here's the key, insulin is primarily driven, is primarily acting upon the sugar that is coming into our bodies. The glucose response.

Now, this again could be the naturally occurring sugars as it's getting broken down into glucose or the added sugars. So, when they show up on the scene, blood sugar spiking foods can push the body into, eventually, a state of insulin resistance. Now, how does this take place? Well, insulin is going to be responding to the glucose coming into the bloodstream to...



Essentially one of its roles is to get that glucose out of the bloodstream because it's very dangerous for glucose to be rampant in our bloodstream because it's very volatile. This can spur about damage to our vascular system. This can also spur about advanced glycation end products or AGEs, which is this process of glycation, is where we have this chemical reaction, this combustible reaction where the sugar in our system is reacting and excessively exposing our proteins that our tissues are made out of, and lipids to excessive sugar. And this oxidation process can take place, these reactive oxygen species, these out-spurts. And we see glaciation being an issue with skin damage, accelerated aging of the skin with, again, as I mentioned, vascular injuries. It's a big deal. And also, even degradation to our brain tissue. So, not very fun. So, as we're bringing in glucose, it's going to incite insulin to clean up the blood and no harm, no foul. All good.

Well, not so much. Because as this is happening in the quantities that the human body was never designed to handle, insulin is just continuously having to work overtime. And as this is taking place, the cells themselves that are then forced with the job of storing this excess energy, it starts to stop listening to insulin outside screaming at the door, "Hey, I got some packages for you. Can I store some stuff with you?" Constantly knocking on the door. And eventually, you're just like, "Bro, I can't. I can't keep any more of your stuff here." And so now it's becoming resistant to insulin. And it's not hearing the doorbell or hearing the yells and the screams from insulin. And this is the state of insulin resistance. But this doesn't mean that the pancreas is not making insulin in response to the sugar coming in. It's still doing that if we're talking about in relationship to type 2 diabetes. This is not an issue where the beta cells of the pancreas are no longer making insulin. Because again, alpha cells are making glucagon. The beta cells are making insulin. It's still being made, but the insulin sensitivity has gone down dramatically. Here's the biggest issue when it comes to our body composition. Insulin literally blocks the activity of your fat-burning hormones. Insulin is about growth. It's about storage.

And if it's active, your body is not even considering. This is largely a binary system here. If insulin is flowing in your system, this whole process of breakdown of stored energy is just not happening, especially to any notable levels. So, part of the process of weight loss and of fat loss, of healthy sustainable fat loss is helping a metabolic shift where insulin can go and have a time out, to sit down, do something constructive and allow the other brother, glucagon, to do a little bit. Let glucagon get some shine. Alright. So, this is one of the big things that's taking place in our society, underpinning our obesity epidemics, our diabetes epidemics that are literally killing hundreds of thousands of American citizens every single year. And this just simply does not have to happen. Now, moving on, if we think about, again, stepping back and breaking up with sugar or staying friends, dramatically reducing our sugar intake, this is going to heal that relationship. It's going to start to increase insulin sensitivity of the cells again, once insulin is able to back off a little bit. There was a time when it was believed that type 2 diabetes was irreversible. And now we know that it is very much reversible. The signaling, that

association, the insulin sensitivity can be dramatically improved once we take our foot off the gas and allow the body to heal, and that connection, that communication to heal as well. Alright.

Now, moving on, it's not just that insulin is just magically making fat. It doesn't work like that. A lot of the burden is being handled by the liver. The liver is a huge player in this association, this onslaught of sugar that takes place. I'm going to read to you another segment from Eat Smarter. This is from a subsection called Carbohydrate Bombardment when I'm talking about this amazing organ we have, liv-er. The liv-er. Largely responsible for us being able to live. So, this subsection was called Carbohydrate Bombardment. Starches and sugar have the fastest ability to drive up blood glucose, liver glycogen, and liver fat storage compared to their protein and fat macro-nutrient counterparts. Bringing in too many carbs too often can elicit a wildfire of fat accumulation. In fact, one of the most effective treatments for reversing non-alcoholic fatty liver disease is reducing the intake of carbohydrates. A recent study conducted at KTH Royal Institute of Technology and published in the journal; Cell Metabolism had overweight test subjects with high levels of liver fat reduce their ratio of carbohydrate intake without reducing calories. After just a short two-week study period, the subjects showed, "rapid and dramatic" reductions of liver fat and other cardiometabolic risk factors.

Alright, again, that's a segment from Eat Smarter addressing how the liver itself is now... Not alcoholic fatty liver disease, we already know that alcohol can absolutely be a terrorist of sorts to the liver. And liver disease is now creeping its way into the top 10 causes of death in the United States. It's currently at 11, but non-alcoholic fatty liver disease is a big reason why and the underlying cirrhosis that can take place and the list goes on and on. It's a huge, huge issue. But what happens with our rampant sugar intake is that the liver is kind of taking on the burden. When the pancreas is just cranking out and doing this work and our fat cells are struggling, the liver is like, "I got it. I'm the one that helps us live. I got this. Let me see what I could do." And the liver is re-packaging... Is responsible for re-packaging that glucose into fat. It can literally do a process... Ignite a process called lipogenesis, the creation of fat. And also, store... Not just glycogen is getting stored in the liver, but, if need be, the liver is going to store fat there as well. So, we can get it shipped out to other places and-or store within itself and kind of just take the abuse, and, eventually, it's going to break down.

Princeton researchers found that high-fructose corn syrup prompts considerably more weight gain than table sugar. And this is in relationship to the impact that it has on the liver specifically because, unlike glucose and sucrose that is going to have this association with the pancreas and with other organs, high-fructose corn syrup goes directly to the liver. The liver is immediately taking that intake. It's kind of this very strange... Again, "I'm jumping forward to handle this situation." And so, this is why high-fructose corn syrup... So, we've got our concentrate of sugar in the form of cane sugar, coming from that origin, then we've got all

these other types of sugar that have been created today. And high-fructose corn syrup, coming from corn and being added... Particularly in the 1980s, it skyrocketed in use because it was very, very cheap. Still today, a huge majority of the corn that is receiving government subsidies, by the way, that means we're paying it. And billions of dollars are funneled into growing corn that's largely used in the creation of processed foods and fast foods, and this is a big issue for the breakdown of our liver.

And by breaking up with sugar, your liver will finally be able to offload the excess glycogen that's been repurposed as hepatic fat or liver fat, and your liver function will improve dramatically as will your overall metabolism as a result. Your liver has a massive impact. It's even helping to break down insulin as well. So, there's so much in relationship to healing our liver that takes place when we break up with sugar. Yet another way that our bodies change when we break up with sugar has a lot to do with our brain. Even though our brain only accounts for about 2% of our body's overall mass, our brains actually consume about 20-25% of our caloric intake. We have a very, very hungry brain, and it is especially hungry and designed to rapidly pull in glucose. Here's another section from Eat Smarter, "Since glucose is your brain's primary fuel source, there are accustomed sugar gates in the blood-brain barrier to allow glucose to pass through in droves. As far as your brain is concerned, it's expensive to keep the lights on upstairs. And Harvard research has affirmed that the brain will gladly confiscate half of the sugar energy you consume during a given meal.

Since sugar is always funneling into and throughout the brain, insulin activity in the central nervous system has become a huge topic of discussion in science the last few years. Research published in the journal, *Frontiers in Endocrinology*, states, 'Insulin in the brain contributes to the control of nutrient homeostasis, reproduction, cognition, and memory, as well as neurotrophic, neuro-modulatory, and neuroprotective effects.' The report goes on to affirm that there's a delicate balance of glucose needs and glucose over-burden through high sugar intake. The researchers noted that excessive glucose can directly lead to insulin resistance extending to the central nervous system, higher incidents of Type 2 diabetes, and a dramatically increased risk of Alzheimer's Disease. In fact, they declared that 'A close association between Type 2 diabetes and Alzheimer's disease has been reported to the extent that Alzheimer's disease is twice more frequent in diabetic patients, and some authors have proposed the name Type 3 diabetes for this association.' This is critical to understand. To reiterate their findings, excessive sugar intake and insulin resistance is so connected to Alzheimer's disease that scientists are now referring to it as Type 3 diabetes.

The over-consumption of sugar is devastating for your brain. And our society doesn't just have a sweet tooth, it has an iced-out grill full of sweet teeth." Again, that's a segment from Eat Smarter, and in it, we're looking at what can we do to reduce the risk of some of our most devastating health conditions. Alzheimer's disease is a leading cause of death for our citizens,

and folks often don't understand why. It's not just a matter of forgetting your keys or forgetting your loved ones, which is devastating in of itself, but, with the degradation of the brain, you could stop learning or the brain understanding how to breathe, how to eat. Our biology can start to break down so much, the association, the communication between your brain and your other organs that this is a really difficult thing, and a very treacherous way, for us to lose our lives. And people who've gone through this with loved ones know the impact that this can have. And again, the rates of Alzheimer's have skyrocketed in recent years, and it's as if we just don't...

Oftentimes in current medicine or conventional medicine, just throwing up their hands. We don't understand what's happening. Things don't just happen. A big part of this reason is our rampant intake of highly refined sugar and processed foods. Now, here's the good news. Our brains have the ability even with this damage that sugar can do to operate, to shift over to using an alternative fuel source. Researchers at Yale University published data reporting that MCTs, medium-chain triglycerides can readily cross the blood-brain barrier and be utilized by brain cells. A remarkable study published in the annals of the New York Academy of Sciences sought to find out if MCTs could have an impact on improving the condition of patients with Alzheimer's disease. The scientists in the study discovered that since MCTs are quickly metabolized by the liver, prompting the production of ketones, those ketones are then able to easily cross the blood-brain barrier and provide an alternative fuel source to the glucose-impaired brain cells of Alzheimer's patients. The scientists found that the consumption of MCTs directly led to improved cognitive function in mild to moderate forms of Alzheimer's disease and cognitive impairment.

There is hope. It's understanding how our biology work, the basics. All of that sugar just cascading the brain cells, we have upwards of 100 billion neurons that we're talking about, just getting bathed in all of this sugar, creates an insulin resistance in the brain. This alternative fuel source, ketones and MCTs themselves can directly nourish our brain cells and help to run processes. So this is yet another reason why MCTs are such a remarkable thing. We can get MCTs from whole food sources. And one of the strange ones... Now, it might sound strange, but there are several different ones that are more strange, is goat's milk is actually a pretty dense source of MCTs. On the vegetarian side, coconut and palm are going to be some decent sources, but the concentration amount, the fraction of the MCTs are going to be smaller. So to get a concentrate of the MCTs from those sources, you would get a specific MCT oil. This is something I had today. I utilize essentially, every day in my life I'm having an MCT oil, only from Onnit. This is the place that I get my MCTs because they're doing things right. Sustainable, processed correctly, utilizing the best sources, not just random companies getting this stuff, who often, unfortunately, they're not abiding by high standards of quality. Go to [Onnit.com/model](http://Onnit.com/model), that's O-N-N-I-T.com/model.

You're going to get 10% off their original MCT oil, and also they have emulsified MCT oils, that are more like a coffee creamer, they're great to add to teas, smoothies, coffee, things of that nature. I love the almond milk, latte flavor is my favorite. So this can be a process where it's not just shifting over and breaking up with sugar abruptly, but you can have a new book there, you can have a new relationship sparked, that has joy, that has connection and healing properties. So outside of the goat's milk domain, people are doing camel milk now, they're doing all... They're milking everything out here. Of course, and milking Almonds, which I didn't know that almonds necessarily had the teats, but they do. I have a nut-milk bag, and that is probably the worst product name ever, where we were making Almond milk as well, but that MCT concentration from coconut source, that specific fraction.

The MCTs are just remarkable. Again, go to [Onnit.com/model](http://Onnit.com/model) for 10% off, and now let's talk about one of the most impactful aspects of this episode, and the connection between sugar and our brains. Yet another way that sugar impacts our brain and our cognitive function is the connection that it has to changing our behavior, literally driving us to seek out certain things. To seek out namely more sugar, sugar has this well-noted ability to change our physical state to the degree that, back hundreds of years ago when it was hard to get your hands on some sugar unless you had some paper, as you had a lot of banks, folks were really using this to access a sugar high, it was considered in a class of a recreational drug. It will get you this energy, but also it'll get you into this state of depression afterward, and so you get yourself another hit.

What's going on here behind the scenes? Well, we know that it's changing our mental and emotional state, this is one of the gifts that sugar does, but it can, in many ways, do it in a much more subtle way, depending on how much you're taking in. In the brain, sugar can stimulate the pathway that's often related to the feel-good neurotransmitter Serotonin, but there's also a stronger connotation with sugar and dopamine. Now dopamine was thought to be this pleasure-related aspect of our biochemistry, so it's all about pleasure, but now we know that it's much more about drive. It's much more about attraction, dopamine drives you to seek. It's a seeking motivator, and this is where sugar is really pushing down the button, is the seeking. Sugar can induce feelings of euphoria or even a quote... And what do we call that? We call it a quote, "Sugar high." Sugar becomes glucose in your bloodstream really, really quickly. It's one of the fastest converting things in the glucose, so it can make you seem or make you feel with the body to now extract a lot of apparent energy. And even we'd mostly attributed this to kids gets you "hyper," but refined sugar will also create this kind of roller coaster effect with your moods. You'll be feeling awesome and then crash hard into lethargy and even depression, and you can even get...

Because of this roller coaster, it can create this pathway towards addiction and horrible withdrawals as well. This is noted about researchers at Princeton University reporting that

repeated sugar consumption will cause a demonstration of all three criteria of addiction, increased intake, withdrawal, and cravings that lead to relapse. An additional study in the same domain was conducted by scientists at the University of Bordeaux and published in their peer-reviewed journal, PLOS One, the Public Library of Science One.

In this study, the researchers set out to find how an artificial sweetener saccharin stacks up in addictive behavior against a strong narcotic, namely Cocaine, they gave rats with no prior experience with refined sugar or artificial sweeteners, the ability to choose eight times a day between two mutually exclusive levers, one that gave them a dose of cocaine and one that gave them a dose of saccharin sweetened water. The results showed that a shocking 94% of the time, the critters became hooked on saccharin and not cocaine, and get this, even the rats that were already addicted to cocaine quickly switch their preference to saccharin once it was offered as a choice. The scientists in the study concluded, quote, "Overall, research has revealed that sugar and sweet reward can not only be a substitute to addictive drugs like cocaine but can even be more rewarding and attractive, at the neurobiological level, the neuro substrates of sugar and sweet reward appear to be more robust than those of cocaine.

I.e, more resistant to functional failures, possibly reflecting past selective, evolutionary pressures for seeking and taking foods high in sugar and calories." So the reason that this is happening where this well-noted highly addictive destructive substance is being shunned and 94% of the time the rats are shifting over to the sweet flavored beverage is because of these evolutionary adaptations, this selective pressure for us to go towards things that have a lot of energy, a lot of caloric energy, so we could store them for survival, and in this study, the researchers also swapped in sugar by the way, in place of the artificial sweetener and saw the same results. It's not simply a matter of willpower, this is the problem, this is a matter of our biology. When we get into this battle of our willpower versus our biology, our biology is going to win out in the end, we can have the willpower of Will Smith or Will Low or William Shatner, alright... Lot of wills, lot of willpower, but eventually, our biology is going to win out, and this is the position that we're putting a lot of folks in, where we're telling them, you shouldn't eat sugar when sugar's already... It's already...

The relationship is so deep, it's a love affair, but it's a toxic relationship, let's be honest. Sugar's being a bit abusive, and the friends are pointing it out, but they can't see it. Alright, so we got to step back and stop pointing the finger at folks and ignoring the fact that their biology has become manipulated by food manufacturers who are intentionally putting these things into our food supply, and for most folks, myself included. I grew up in an environment where that's all I knew; I didn't know any better. We are existing in a state... In the United States, it's considered poverty, which even in the United States, poverty is very different from other places in the world, so I always like to have that caveat, but we're on government assistance, we are getting food from food pantries and donations.



This is the environment that I grew up in, and everything around us was processed foods that was largely just loaded with added sugar, now again, it's not that I wanted this to take place, I didn't know any better, so I'm addicted out of the gate. Immediately as soon as I set foot on planet Earth, sugar is already in my bloodstream, 'cause my mom, even as I'm in the womb, you better believe she's knocking down some Pepsi's, so this addiction is already just taking place and you're in the environment it can be very difficult to help to turn this off, and this is why breaking up with sugar could be so complicated, and health experts are out here doing these different challenges and telling people to quit sugar, we've got to give people the honest truth.

This is not necessarily always an easy thing, we've got to talk about, get educated on the underlying mechanisms because awareness really trumps everything, awareness starts to unlock those doors, so you start to know what's going on, you start to know what you're actually in for, first of all, potentially and you start to understand and being able to see the things as they come along. It's much easier when you have a map that has some of the things outlined for you, rather than the thing just showing up like, "Oh yeah, I'm going to do this sugar detox," and then three days in, you're like, over there, you got the sugar jitters, and you're looking for some old Halloween candy that your kids might have on top of the refrigerator in their... The little bucket or whatever, first of all, if you got some Halloween candy left, throw it away. Alright, come on, I know it doesn't have an expiration date, but just come on. At some point, you got to throw that Halloween candy out. Now, with that said, one of the first steps in this process of breaking up with sugar, the first on-ramp that I often give folks, and we talk about the data behind it, is to address the liquid sugar consumption, the sugar that we eat.

I don't think folks realize just how quickly that sugar ends up driving so fast and furiously into our cells, it's just like Vin Dieseling into our cells so quickly, but nothing happens as fast as sugar that's coming along in that liquid form. A study that was published in the Journal of Nutritional Biochemistry asserted that our fastest method of delivering sugar to our cells is through the consumption of a liquidated sugar, again, this is well established and it's just... It's a logical thing. The researchers asserted that the consumption of highly concentrated liquid fructose leads to the development of hypothalamic leptin resistance and the development of excess visceral fat.

None of these are good. First visceral fat, this is more a cognitive visceral association because it's something we can see physically. The visceral fat, aka momentum fat, aka belly fat, is that deep abdominal fat. We're seeing first-hand, these researchers are indicating that the consumption of concentrated liquid fructose is directly causing this issue because one of the primary drivers of the belly fat or visceral fat epidemic that we're experiencing as a society.

But for this, for all intents and purposes right here of breaking up with sugar, the hypothalamus is well established to be the master gland in the human body, a master regulator of your entire endocrine system, aka your hormone system, and it's really a tie-in.

It's far more than just an endocrine gland, it's a tie-in for your endocrine system and your nervous system. So, all the data from your nervous system, your brain, and all of the offshoots of your entire nervous system throughout your body, that data integrating with your hormone system, your system of hormones that are getting produced from your thyroid, from your adrenal glands, that integration point is taking place largely in the hypothalamus. So again, it's a master regulator of your entire endocrine system. It's really a primary point of emphasis if we're talking about your metabolic rate, because your hypothalamus is like the thermostat that your body is set at for its rate of calorie burn and calorie absorption, in constant communication with your gut to even indicate if your downstream supplies, if there's information coming up that your supplies are low, your hypothalamus can send data to your gastrointestinal track, to your gut to actually increase the absorption of calories from your food, or it can tell it, turn it down some. It's so remarkable when we start to understand this, but hypothalamic leptin resistance. So leptin is a primary satiety hormone. When leptin is being produced, it's telling your body, "I'm satisfied, I'm not hungry." In this battle, this potential break-up battle, some sugar baby daddy drama, or baby mama drama, sugar baby...

I'm thinking, I'm sorry, I'm thinking about the candy, alright, sugar daddies, alright, it's the little chewy little candies anyways. But that sugar baby daddy drama, 'cause there's also sugar daddies, alright, and there's the sugar babies, and those are the little bite-size, and the sugar daddies was on the stick. So, when this is taking place, that struggle in breaking up has a lot to do with the satiety hormone where the craving start, where the inability to not be drawn towards it, has to do with the satiety hormones significantly. And when the brain, which is the primary site for leptin's communication to tell your brain and physiology because your hypothalamus is informing everybody that, "I'm good, I'm peaceful, I'm satisfied." And if there's leptin resistance for your hypothalamus, that your body's producing leptin but it's not the message isn't getting received, guess what's going to happen? It's going to be a tremendous struggle to be able to manage one's satiety and manage one's cravings. What's driving this breakdown? Liquid sugar, liquid fructose, primarily as is indicated in the data, and it just makes sense because it's hitting your system so fast. So, here's what we do. Number one, we look at an example, number two, we take the on-ramp of addressing this.

Let's take an example of a 20-ounce bottle of Coca-Cola supplying 65 grams of sugar. That's 16 teaspoons. That's a normal Coca-Cola bottle. In our society, 16 teaspoons. Let's take your little teaspoon scoop, let's go, scoop them. One, two, three, four, five, six, seven, eight, nine, diez, throwing a little foreign language there, 11, 12, 13, 14, 15, 16 teaspoons. That's a butt-load of sugar and has become a common part of our culture. But for me, I wasn't the biggest soda

drinker. I love my juices, Hawaiian Punch and even what we consider to be a 100% juice. Orange juice, that was my jam. 100% pure orange juice is actually not far behind that Coca-Cola in its sugar content. It has in its same 20-ounce amount, that will be 56 grams of sugar for a whopping 14 teaspoons. Now, we can say it's coming from a more natural source, cool. We're talking about sugar here, because that amount of sugar coming in is going to hyper-stimulate insulin, it's going to damage leptin and literally derange the communication between your brain and your body. It's just not appropriate. For most folks, sure.

If you have an orange juice every now and then, sure, okay. I was drinking orange juice on the daily, if we had it. And I have no idea what it's doing to my biology. So, these are the steps. So, we're looking at what the problem is. On-ramp step for how do we break up with sugar? Step number one let's ease back on the liquid sugar. Step one, you don't have to stop cookies, ice cream, all the other stuff, okay? Just, let's put the sodas to the side, it's just not worth it, alright? And we can have this conversation about, well then what about artificially sweetened sodas? That behavior and I talked about this in Eat Smarter as well, we have some peer-reviewed evidence linking artificial sweeteners to increased rates of dementia, for example. This isn't without a cost, and for some folks, they've used artificial sweaters to great reward, and that's all good, but we cannot be ignorant of what the scientific evidence states because our biology is wired a certain way, and we literally creating a chemical structure that has never been invented before or used before in human history, throughout evolution, and trying to trick the body into believing that this sweet thing that there's going to be calories coming along with it, but it's just like no, there's no calories actually, or there's far less calories than what the sweetness is indicating.

We're acting like our body is stupid. We're acting like our brains are stupid, we can just trick that silly brain of ours, when in reality, scientists at the Washington University School of Medicine constructed a trial that involves 17 obese test subjects who did not regularly consume artificial sweeteners. They found that the artificial sweetener Sucralose, that was used in this particular clinical trial actually elevated their blood sugar levels by 14% and increased their insulin levels by 20% on average. This is a non-caloric artificial sweetener that's used to trick the system, why is our blood sugar going up? Why is insulin going up? Artificial sweeteners pretend to be home alone, in a sense. It's like a Home Alone scenario, we got the people creeping in, but really you about to get hit with some booby traps. The sticky bandits, the wet bandits, that's what we're really getting with this liquid. We got the sticky syrup, and we got the liquid substance, so that's truly like, by the way, this is a Home Alone reference, hopefully you've seen part one and part two if you're a person, right?

But please understand that this is not coming without a cost, let's just step away from that. And sure, we can substitute and maybe try, do a little swappy swap, maybe you do a kombucha, which you got to be careful with the sugar there too. Let's be honest, but the sugar is far less

on your nice kombucha or kefir as a bridge. Some folks say they do sparkling water, it's all good. I don't necessarily think that that's for most people, they're not just going to be like going from a nice little crisp sparkling water, a La Croix, and they're just coming from Mountain Dew and just talking about, "Yeah, this is great! This is a great substitute."

It's not for everybody, alright? So consciously stepping away from the liquid sugar delivery system, and also the same thing with juices, we got to be mindful even if we're making fresh press juice, what is the sugar? Especially if we're trying to get healthy and we're wondering what's stopping us. Let me be clear, this doesn't mean that juicing, especially even adding in a little bit of fruit with our juicing, cannot make somebody dramatically healthier, let's be clear. But if we've been doing something for a while in our body, we're not getting the results that we've really been looking for, we want to pay attention to the sugar. Because we want to allow for our hypothalamus to literally heal that connection between our brain and the rest of our physiology. Get leptin sensitivity high, get insulin sensitivity high, you start to heal this situation.

Another remarkable way to separate from sugar, where your friends like, "Girl, you don't need it." Another remarkable way to go about this is to focus on building muscle. The thing about our muscle tissue that's so remarkable is, we don't really even need insulin involved in the capacity that's happening with the rest of our bodies. Muscle can uptake and utilize sugar and help to balance our blood sugar in a way that we are just now starting to acknowledge and understand. It is truly remarkable. And as we're focusing on building muscle, it's increasing our overall insulin sensitivity systemically, and so once we can shift over a part of that healing process and that, for some folks when they are breaking up their focus, they're changing their life, they're focused on getting fit, alright? My deepest condolences to the person who lost me, 'cause I'm about to take it to another level, alright?

So, focusing, making this hand-in-hand with backing off on the liquid sugar delivery and also focusing on building some muscle. So, this is going to be through primarily resistance training. We doing the squats, doing the pushes and the pulls and the lunges, all of the basics and there's thousands of ways to do this stuff and combine 'em in different ways, but the bottom line is we're making a priority, at least just twice a week, two to three times a week, doing some resistance training. Adding some more muscle to our frame can dramatically help to reverse the sugar curves. Also, another helpful thing in recalibrating those satiety hormones is, this is just remarkable, something I didn't expect, is chlorophyll.

That's right, the green, essentially, the blood of green plants, which has a very similar structure to our blood as far as the constituents of the cells. Chlorophyll really has this really interesting resonance with the human body, there is of course a difference with the nucleus and the magnesium content, and these different things, but it's pretty astonishing how similar they

are. Now, again, just to be clear, human blood, plant blood, not the same, but there is a synergy. There is, there is a parallel here in chlorophyll, and just to add to that, chlorophyll has a really interesting resonance with the human body. A study that's published in peer review journal, Appetite, found that chlorophyll can actually assist in weight loss, and here's the big key, help reduce the urge to eat hyper-palatable foods.

This is what we're going for. Something is happening with the biochemistry, something is happening with the brain, where the body is now, there's a higher level of satiety taking place, and the drive to eat sugar in the form of these hyper-palatable foods is going down. Specifically, chlorophyll, the densest source of chlorophyll, one of the top three, we got Spirulina, we've got AFA Bluegreen Algae, we've got Chlorella. That's where Chlorella gets its name, it's so high in chlorophyll. Chlorella contains lutein and zeaxanthin, and these are two carotenoids that are proven to... There's so many benefits here. One of the craziest ones is lowering the risk of macular degeneration, it's one of the things that's targeted with diabetes, for example, is losing vision, come on, it's protective in so many different ways against the outward effects of sugar. A double-blind placebo-controlled study published in Clinical and Experimental Hypertension found that Chlorella was able to normalize blood pressure of test subjects with hypertension. We're talking about blood sugar, one of the primary controllers of our blood pressure influences over our blood pressure, and also our vascular health in general, is that sugar content.

So we're finding that chlorella, for example, is helping to heal and support our blood. And again, this goes back to that similarity when we talk about chlorophyll and human blood. For me, Chlorella and also spirulina, I get those on a consistent basis from Organifi Green Juice as organic chlorella, organic spirulina, which is about 70% protein by weight rich in zeaxanthin, rich in phycocyanin and other really remarkable compounds rich in magnesium, all these things are really supportive of helping the body to get back in balance. Go to [organifi.com/model](http://organifi.com/model), they actually have 20% off there for you with the Organifi Green Juice that's O-R-G-A-N-I-F-I, dot com/model, get 20% off their green juice formula and it actually tastes good as well. So, helping to recalibrate your palate is going to be a big part of breaking up with sugar. So we can do that through the nutritional means, but also we can do this and not just shifting like the macronutrients and certain micronutrients, but making a shift in what we're adding as far as tastes are concerned, because recently discovered we know that we have certain proteins that actually detect and are able to change and evolve as we have this saying in our culture, that our taste buds are changing, that literally is happening.

This is why certain foods taste different over time, alright? And introducing new flavor sensation, so maybe if you have been just really hard in the sugar game, you start to add in just a little bit more bitter, a little bit over here, a little bit more sour, maybe it's some pickles or some pickle juice or whatever the case might be, it literally starts to influence and shift what

you're palate, its intelligence. Alright? So, if we can proactively start to add in some different flavor dynamics besides the sweet, sweet, sweet, sweet, it helps to reduce the urge and reduce that one-button flavor connection, and also flavors through our evolution, they indicate nutrition. Flavors are sort of like little invisible nutrition labels to your body indicating that your body's going to be getting certain stuff. This is why if, again, sweet is indicative of a high caloric concentration. So, bitters are indicating, various bitters' medicinal properties. So, these are all things that help to recalibrate and improve up-level our system and our association with sugar. And as we've covered today, as we begin to break up with sugar and just reduce that relationship a bit, because we don't want to be so neurotic that, "All sugar's bad, sugar is this and that."

It's a part of our culture. It's an invention. It's a human creation. Some of this stuff can be an abomination, but this doesn't mean that we can't interact with these things and still be healthy. Alright? We just want to be aware of we've went way too far to the other side, and it's having a notable impact and really devastating the health of our families, and that's not a joke, it's not okay, but to just villainize this thing, it creates more apprehension for folks to be able to move away from it. For sometimes, again, you start to point out the abuser, it can make the person even more connected and attracted to them, pull away from you. Alright? So, we want to enter this conversation intelligently and understand that this doesn't mean that sugar is just all bad, you can never have sugar again. For some folks, they need to break up with sugar, they can still be friends, but for other folks, maybe they're experiencing a challenge with their health right now, they need to literally break up and then move to another part of town. Not associate with them until they're healed.

Alright? So, I hope this was valuable to you in understanding some of the underlying mechanism, some of the history with sugar, and some simple on-ramp action steps that we can start to take to heal our bodies, to heal the communication between ourselves and just to usher in a healthier society. If you got a lot of value out of this, please share it out with your friends and family on social media, and you can tag me, I'm @Shawnmodel on Instagram and Twitter, I'm @themodelhealthshow on Facebook, and of course, you can send us directly from the podcast app that you're listening on, and listen, I appreciate you so much for tuning in, and we've got some powerful, amazing masterclasses and epic guest coming your way very, very soon. Take care, have an amazing day. I'll talk with you soon.

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