

# The Truth About Sugar: Addiction, Disease, Weight Gain

The truth about sugar is it's addictive, we crave sugar, it does not satisfy our hunger, it piles on the pounds, and promotes disease. Watch as 4 people with high sugar intake try to reduce their sugar consumption to under 6 grams per day.

I always thought a low-fat diet was the way to go. Saturated fat was always the enemy because it raises your cholesterol.

And then there was a big war on this: good old salt because it raises your blood pressure.

But now it seems something that's been innocently lurking in our cupboards for centuries is the new public enemy number one. It's sugar. And I don't really know why. So I'm gonna go and find out.

I'm Fiona Phillips and like most of us, I love my sweet treats. But I want to discover the latest science about what sugar is really doing to us.

This is part of the brain that reacts when you have sugar, and food, and sugary drinks. And it's why you might be eating far more than you think. Oh! That is a lot of sugar.

I'll be uncovering how you can spot the sugar in foods you think are sugar-free, how clever cookery can get sweet results without adding sugar, and revealing the sugars that even doctors say you can enjoy guilt-free.

## The Truth About Sugar

I'm going to find out their surprising and very sticky truth

about sugar.

We Brits love our sugar. It's one of life's great pleasures. And we're getting through over a million tonnes a year. That's 15 teaspoons each a day. There's no getting away from it, that's more than we should be eating.

## **Four Brits With Sugar Problems**

I'm meeting up with four rather brave volunteers in Newcastle. I'm going to start by showing them how much sugar each of them is getting through every week. I'm asking them to cut back to just 6 teaspoons a day. A target the World Health Organization believes is the best to aim at.

first up is Cara Patterson. She worries that sugar is taking over her life. "I'm definitely addicted to sugar. I crave it. The worst time that I want sugar as soon as I wake up. Breakfast always contains something sweet."

Well Cara, your average daily sugar intake was 28 teaspoons. Cara's eating nearly five times the six teaspoons a day target that I want her to aim for. This is going to mean some big changes for her.

Rick Shabilla comes from a Sikh family with a history of type 2 diabetes. He worries that his love of sugary Indian sweets could land him in the same boat. You've got your Indian desserts which we know are very high in sugars. These are normally accompanied with some ice cream, which should be I think, even more.

Your sugar consumption 29 teaspoons per day a day. That's really terrifying, to be honest. Like Cara. Rick is also nearly five times over where I want him to be.

Audrey Kanin feels her weight is getting out of control. A life on the road as an acquisitions manager has led to a diet of processed food and sugary snacks. It's just as easy for me

to eat in the car as it is to have something because I just want to get home. We've got the chili beef here that contains five teaspoons of sugar in half the pack, which is a portion. I wouldn't even think to look at the sugar content. I would maybe look at the calories, or the fat, but I've never ever thought looking at sugar.

Your average daily intake was 23 teaspoons. So to be on target Audrey's going to have to cut pretty well three quarters of this sugar from her diet.

Simon Gallagher loves his fizzy pop. But at 26 stone he's becoming increasingly worried about his health. On a normal day I have three or four cans of fizzy drink. If I'm at home it can be pretty much any amount until I feel sick, basically, or until I run out.

Simon you're smiling now. The problem is that you have a huge amount of sugar. As it stands, you're having a whopping thirty nine teaspoons of sugar every day. Just to reiterate, this is fifty seven kilos per year, or fourteen thousand teaspoons of sugar you're putting into your body.

Simon is six and a half times over and we'll have to make the biggest changes of all. Although current guidelines suggest we should aim at less than 12 teaspoons of sugar a day, the World Health Organization thinks if we can reduce this to six it would have even bigger health benefits.

It's going to be a tough target for my volunteers. But I'm hoping the more I can learn about sugar, the more I can help them cut back.

The sugars we need to be looking out for are known as free sugars. These include the sugars found in honey, syrups, and fruit juices. But the main culprit is refined sugar we add to food.

# The Truth About Refined Sugar

But what does refining sugar actually involve? And why does it make it a potential health problem?

Biologist Dr. Marty Dobson is going to help you find out. This is one piece of sugarcane. Beautiful. It's a huge grass that grows down in the tropics. And this stuff is packed full of sugar. And the way we get it out is the first thing we have to do, we need to break it down a bit.

Now what I'm gonna do, I'm gonna give you this bowl. You need to go round there. Juice as it comes out. Here We go. Easier said than done.

All sugars are natural and come from plants. Sugar cane and sugar beets are used in sugar production as they have particularly high concentrations. All this refining is designed to make that concentration even higher.

Carbon dioxide is then used to remove impurities like wax gum and fat, all with the aim of giving us pure, refined sugar. And now, we just have to boil it down. So what we have now is a thick syrup. We leave that to cool and the sugar will start to crystallize out. What you'll end up with, is this, which is sugar. There's a lot of treacle there as well. But that is incredibly sweet.

However there's not that much of it is there, considering it came from all of this bulk and all the effort it took to get it out? Yes, exactly. What we're gonna throw away, all of this, this, roughage and fiber, So what you're left with here is, essentially, pure calories. The refined sugar that we use at home has basically had all the fiber and roughage stripped away to become pure energy.

And Marty wants to show me just how much energy there is in the four grams of sugar that make up a level teaspoon. I've taken a teaspoon a level teaspoon of icing sugar and put one

in each of these tubes, about two teaspoons of sugar. You take those put them on first. And what we're going to do is blow down these tubes. Blow mind you. Three, two, one. So all that energy in one level teaspoon. Exactly. That's the energy you get if you eat it as well. It's the same amount of energy. The flames may look impressive, but this energy is the real danger of sugar. If you don't burn it off, it can make you fat very quickly.

But I had no idea just how quickly. Imagine, say you're drinking three cups of tea a day. Okay, you put two teaspoons of sugar in every cup, 365 days. Now imagine you're also not burning off that. How much of my lovely fat substitute would you end up in your artificial belly if all of your sugar that you put into your tea was turned into fat? It wasn't burnt off. Six teaspoons a day for a whole year. And I didn't burn it off. Correct. How many of these? One of those, let's try one. okay? Let's do one.

Sugar is one of the cheapest forms of calories. It's not just bad for your teeth. If you have too much, your liver will end up turning it into fatty acids that your body will store as fat. It feels really uncomfortable. So this is the second of my bottles. Okay. Nice. I don't want more. I'm afraid we're getting there. We're getting there. So what you've got there is four and a half kilos of fat, over half a stone.

I know I can. And all because of your six teaspoons of sugar that you were having every day for a whole year that were excess to what you need. Having a sweet tooth like that can lead to weight problems which could be seriously dangerous. If just a few excess calories from sugar can cause issues over time, what of high sugar diets done to my four volunteers at Newcastle University?

## **The Truth About Sugar and Obesity**

Professor Mike Crennel is going to find out. One of the

problems with sugar is it allows you to take large amounts of calories on very quickly which can make you obese. Mike uses high-tech equipment to measure the body fat percentage of my four volunteers.

At the moment, [51 percent of your body is fat](#). Really. Well, it's half my body weight.

All four have levels that are higher than they should be. And it's this body fat that can lead to health problems. Gaining weight can link to heart disease, diabetes, and other long-term conditions.

And further tests show that my volunteers are already in danger. The background of high sugar, high body fat, it's going to place more and more stress on your liver, on your muscles. Mainly on the pancreas. And over time, if you don't do something we're having to take insulin through an injection which is what happens with people when they have type 2 diabetes for a long period of time.

And for Simon, excess fat has led to signs of a potentially fatal disease. When your liver has too much food inside of it, it starts to have this long silent scream, which is indicating to us that you have a condition called non-alcoholic fatty liver disease. And unless you do something, it's very likely that you're going to go on to develop type 2 diabetes. Sugar doesn't directly cause conditions like type 2 diabetes and liver disease. But because it's so energy rich, along with other carbohydrates and fat, it is one of the things most likely to increase your body fat. And it's this fat that will do the damage.

Time for my four volunteers to start cutting back. I'd like you to try it and get down to six teaspoons of sugar a day. Which for some of you, it's going to mean losing 80% of what you're consuming, sugar wise. At the moment it's a tough challenge. Do you think you can do it? It's very positive. Good.

While they're finding out the reality of cutting back, I'm going to be looking at three of the main sources of refined sugar in their diets to see what they're up against.

Sweet treats for most of us. These are the biggest challenge. I want to uncover the science behind why we crave them. Savory foods. Why is the food industry putting sugar in products that we'd assume were completely sugar free? And what is it that fizzy drinks do to our appetite that means some scientists faith their biggest problem of all.

We eat more biscuits than any other country in Europe. And sweet treats are where we Brits get most of our sugar from. So for our volunteers, these have to be the first things to go. But how tough will that be?

## **Holiday Sugar Consumption**

It's the Sikh equivalent of Christmas Day. And there's a big celebration in the local temple. The source of great temptation. Though Rick, this is Guru Nanak dev Geez Gopro, which is a celebration of the birth of our first guru. This is our Christmas, if you will. So there's a lot of sugary sweets and treats to celebrate this event. This is torture. That's sugar written in pretty much pure sugar, deep fried, and then dipped in syrup. It doesn't get any better. What else it doesn't get any more cruel than that. But Ricky's being a good boy. So far he hasn't put anything sweet on his tray. But does that change the celebration? Like Christmas Day without the pudding, this is actually quite, it's quite a big deal. It's really quite challenging that the guys teasing me doesn't help.

Meanwhile Cara is really struggling. Her husband Rob is refusing to dump the sweet treats. Right. I'm just gonna shove all my stuff over there so that you've got the your stuff. And I've got the stuff with less sugar in so they're arranging their cupboards into his and hers. As someone who craves

sugar, this is asking for trouble. But Cara is determined to fight temptation. She really wants to kick her sweet habit for the sake of her son Noah. He's the ultimate motivation. Because I want to be around for him as he gets older. I don't want to be a burden. I wanted to do things with him. I thought one sugar tu be haunting us in 20 years time. Well, there's one thing that's holding Cara back: cravings that she just can't beat.

But why do some of us like, Cara, get really strong cravings for sugar? I'm taking her to Reading University to find out.

## The Truth About Sugar Cravings

Neuroscientists here have been studying what happens to the brain when you eat sugar. And to see what's going on in Cara's head, she's being put into an MRI scanner that monitors brain activity. Cara is given sugar in the form of a sweet drink, and changes in her brain are picked up by the scanner. OK. So Cara, this is an image of your brain that we just took when you were in the scanner. This is a structured image. And on this we can see parts of the brain that we know to be involved in the reward system. So, for example, here we have the [striatum](#), and this is a part of the brain that reacts when you have very pleasant experiences, like when you eat things that you really like, like sugary foods and sugary drinks. And so, if we look at this image over here, this time you can see the actual activity in this part. So that is the reward center and that's the brain saying, "Mmmm... This is really really nice. Wouldn't mind some more of that." So Cara can happily keep feeding herself sweet things and the brain will make her feel better. And what do you think? Seeing this is really interesting because often I crave the sweet things. But a lot of the time, no matter how much I give them the cravings still there. And I still want more. Yeah.

We are hard-wired and biologically driven to see good energy dense foods. So all of us have a primeval urge to seek high



energy foods. And our brains are telling us that. Yeah. Everybody likes sugary sweet things because it's a natural drive.

What differentiates people who over consume those foods from people who don't? We don't know what the biological differences are behind that yet. So to sweet things, habit-forming them. If you have more brain activity underlying this craving or this reward seeking behavior, then you're going to repeat it. And that makes sense. So that is a, that is like a habit.

So there you have it. That is why sugar is so hard to give up. We are hardwired to enjoy it, to seek it out, and that is okay. In ancient times, I guess, when food shortages meant that high-energy sugary foods were literally the difference between life and death. But things have changed. There. And sweet, cheap sugary foods are all around us. And that is not good for us. And frankly, our DNA really isn't helping.

## **Are Some Sugars Better Than Others?**

But, if your brain is egging you on to have a sweet treat, are there any that are better than others? I am confused as to whether any of this stuff might be better for you than ordinary white sugar. Right. Well, let's have a look.

You often hear that honey is good for you, that brown sugar is healthier than white, and that maple syrup is not part of the sugar debate. But what's the truth?

So, essentially all of these are the same. They are all from natural sugars, from plants in different ways. So it doesn't make any difference which one you use. It's just sugar.

I did not know that. I thought that if I put a teaspoon of honey in my tea it was being much better for me than a teaspoon of white sugar. Brown sugar simply has a bit of

molasses in it, and has roughly the same calories as white, refined sugar. And a level teaspoon of honey in your tea will actually have more calories than a level teaspoon of sugar because it has more nutrients and is denser. So there's no getting away from it. None of these forms of sugar are particularly good for you.

But there is some better news. One of the surprising truths about sugar is that if you do want the sweet treat, scientists say that fruit is the answer. That's because the naturally occurring sugar fruit contains comes with so much goodness, like vitamins, minerals, and fiber, that it doesn't count towards your recommended daily allowance.

## **The Truth About Sugar in Our Foods**

But sugar in supermarkets isn't just limited to sweet treats. It's actually in quite a few savory products as well. And often, with a lot more sugar than you think.

I've got a bowl of pad thai noodles here. It's a savory dish, obviously. So what do you reckon, sugar wise? Not much. I think you'd like to spoon in what do you think two teaspoons of sugar in that dish. Oh stop! Nearly nine and a half teaspoons. Nine and a half. That's probably more than a dessert.

It's not just ready meals that can have added sugar. What about one of the healthier, apparently savory breakfast cereals? So bran flakes, dry. But how many teaspoons of sugar, if you would expect any at all to be in there? One teaspoon? Is the one just the one? Okay. Right. I can tell you that there are in fact three teaspoons. I have that because I think that's the healthier choice.

And it doesn't end there. This pack of sweet and sour chicken with rice contains 12 and a half teaspoons of sugar. And there's over six teaspoons of sugar in this can of baked

beans. Ideally, that would be your entire sugar intake for one day.

I'm really surprised how much sugar is in some of our supposedly savory foods. I want to know why manufacturers are adding it. So I'm visiting an International Research Facility in Surrey where scientists are employed by manufacturers to help them create the perfect products.

So, what have we got here Alice? I'm four units soon it's tomato soup and we've got two different recipes of tomato soup. Here one's, got no sugar in it. And just a little bit of sugar in the other. So I'd like you to taste them. See what you think, Okay? That one, okay, okay, well that one's got a little bit of sugar in it which i think is interesting because just a tiny amount can change the taste profile and actually make it taste a bit better. Sometimes it actually tastes delicious. And it brings out the taste of the tomatoes. Okay, that's good, that's good. It's tortoise soup? But is that a good thing. Isn't that then what the manufacturers are doing, making people like it with sugar in? And so they eat more, they buy more. But they're also getting bigger as well well.

They do want to make things that people like. At the end of the day, in fairness to the manufacturers, many are already making attempts to reduce the amount of sugar in their product. And it certainly isn't just the case of the more sugar you put in the more you'll sell.

Scientists here are experts at finding the precise degree of sugaryness which will appeal to customers. The so called BlisS point. Today we've got nine testers over here behind us sitting behind these. All sitting behind these little screens. And we have five different recipes of tomato soup. Going from those that have very little sugar in them to a little bit more, and then a little bit more. And actually to a stage where some consumers might find it too sweet. And the purpose of this exercise is to find that recipe that the majority of

them will like.

So what other products would you test in terms of its sweetness or added sugar? Oh a huge range of products. I mean, everything from yogurts, or cheese, or milk, to ready meals, or drinks, or confectionary. So Alice, tasters have emerged from their hatches. They've tasted their soups. What happens next?

Okay, so we're here in our viewing facility. We can see them, but they can't see us. So this is a one-way mirror. Okay, so we can listen in on the sort of things that they're saying about our tomato soups. And in a moment they'll vote on which one they think has got just the right level of sweetness in it.

So let's start off with sample three four one please. Can you raise your hand if you preferred that sample. Oh, that's interesting. Look, nobody's voted for the one with no sugar. And six for six please. Four votes for the three. Reasons that's the mid-range isn't it? And finally what about 763? Okay, so that's true. I'm two votes for the six percent. Sure, so they're three percent is the winner. That's the one they prefer. And that sort of information for the manufacturer of a savory food is priceless.

## **The Science Behind Sugar Content**

Well I have to say I'm really surprised that there's so much science behind the exact amount of sugar that's being put into our foods. Of course, ultimately it's done to make the food taste nicer so we buy it. And it's good for business. So the question we need to ask ourselves really is, if manufacturers started taking sugar out of foods, would we still buy their products?

All this sugar in savory food is making life difficult for acquisitions manager Audrey Cannon. With such a busy lifestyle, she's come to depend on fast food and ready meals.

But with a history of heart disease in the family, she's determined to kick the habit.

Just coming from work, and normally I would cook some processed food, such as these bumkey wedges. And as you can see, they've got a lot of barbecue sauce. But when I checked on the label, it had three spoonfuls of sugar in and I was astounded. I realized, so I'm gonna make my own.

Trying to get her sugar consumption down means Audrey is completely rethinking her food choices. It's been a big wake-up call to see how much sugars is in what I feel are healthy foods. But it's made the weekly shop a real headache. I haven't really found it difficult in what I've been eating. The difficulties being in what to buy and looking at the sugar content. As I've been going on the supermarket, that's been the biggest challenge.

Audrey's not the only one to struggle with food labeling. I do too. So how can we know when a product is high in sugar? The traffic light system which is the front of packaged systems great because you can see at a glance if something is red, amber, or green for different nutrients. So take these sweet and sour chicken dishes. All of these are red for sugars on the front. High sugar value means that it's got over twenty two and a half grams in 100 grams of product. Traffic lights make it easy. But manufacturers aren't legally obliged to use them. Some don't, and some also choose to indicate the sugar content of a portion rather than per hundred grams.

You take, for example, this pack of crunchy nut cornflakes. You do have some nutritional information on the front of the packet, but just not color code. It's you can't see it a glance. No sugars in that. With products like this consumers have to examine the pack to find the information that some dietitians argue is the most useful. If you really want to know how much sugar was in this you could turn to the back of the pack, and here we can see four four sugars. It's 35 grams.

So that's high sugar because it contains more than 22 and a half grams per hundred grams. So it's a sugary cereal.

This type of supermarket homework is particularly revealing with savory products that you might have thought with sugar-free. You'll see how much sugar it contains: twenty two point eight grams per hundred grams. So it's a high sugar product. Something that you have on your chips so you which you wouldn't associate with sugar. There's something that you think was savory, yes, with some products labeled 100 grams in some proportion and not everyone using the traffic light system.

## **Full Disclosure of Sugar Content?**

I want to know why food manufacturers aren't making sugar content much easier for us. So I'm off to see the Food and Drink Federation which represents the industry.

Do you think that if all foods producers were made to add it to the traffic light system it might help? Because that to me is clearer than all the other systems that exist. Well, I think that there isn't a single solution for a problem such as obesity. That is so complex that the traffic light system would help wouldn't fix it because if you see a red next to the sugar content that would make me put it down. The information that is available on package, whether it's through the Reference Intakes values, whether it's through the traffic light system, is clear and is accurate. Do you not think it'd be a whole lot clearer if the packets showed how many teaspoons of sugar? Then everyone would understand that.

The reason for the amount of sugar has to be labeled per hundred grams. All purple in grams is again in the food information to consumers regulation where all nutrients are treated the same. And a gram is a very well-recognized unit. When, if you talk about teaspoons or tablespoons, what do you think? Four or five or six grams? Well it very firmly seems as

though all the regulation, all the information on the packets, most of which, most of us, got make much sense of it's all there for a reason. It's to educate us. It's to make sure we make the right choices.

But, in the end, it is the responsibility is all left to us. And I don't think, with the amount of sugar they're putting in some foodstuffs, that that is right. I really don't. I think that more owners should be taken by the manufacturers. Added sugar in processed food means the best way ready meal aficionado or jury can get her sugar intake down to just six teaspoons a day is to cook everything from scratch.

But after a day on the road is said daunting prospect. The terms about half of six and I've just got in from work. And I've now got to think about what I'm gonna have for tea. So I'm feeling a bit so frustrated that I can't just come in and cook something easy. And I've got to prepare and think about it and have plenty of ingredients in the house when, really, all I want to do is come in have my tea and sit and chill.

But is there a way for Audrey to have the taste advantages of sugar and savory foods in a healthier way, and without too much hard work? I've set nutritionists Christine Bailey this challenge?

Audrey, you're partial to the ready meals, aren't you? So what tips have you got first of all about ready meals, supermarket ready meals? What to avoid? As well as, you know, a lot of them contain sugar. But particularly, I would say the shop-bought sauces. Things like, you know, the tomato ketchup, the sweet chili sauce, baked beans, and sweet and sour sauce?

The answer it seems is fruit. Remember, sugar in fruit doesn't count towards your daily allowance. So we're cooking a sweet and sour sauce using the natural sweetness of chunks of pineapple to replace refined sugar. And to give it more kick without the calories, just add spices.

We're gonna actually add ,I've got here, some chili, some garlic, you're doing the ginger. I'm gonna use some onion as well. And I'm also gonna add just a little bit of Chinese five-spice, which has that lovely sort of oriental flavor to it.

Throw in some onion, pepper, and soy sauce, and we have a low sugar sweet sauce. To which we could later add a bit of chicken, or maybe prawns. Nice, delicious. You could use that as a ketchup alternative. You and your busy life, I mean, this is simple, isn't it? It is. Because I could just have this ready, and then just cook the chicken when I get home. Yes.

Just boil some rice. It'd be really easy. Well you can both cook it couldn't you? And put batches of fries it. Whip it out when you get home.

For Audrey, its problem solved. It's really delicious.

There's another source of sugar, though, that many of us enjoy. It's this fizzy drinks. Is drinking sugar the same as eating it? While according to some scientists, the answer is no.

## **The Truth About Sugar in Drinks**

Drinks can have a shocking amount of sugar in them. And they're one of the quickest and easiest ways to see your sugar consumption soar.

The numbers, you think, are in this bottle of ginger beer into that little bowl. And that's not all. This one and a half liter bottle of strawberry flavored water contains 18 teaspoons of sugar. This 750 milliliter bottle of Elderflower sparkling water, 13 teaspoons. And this half liter bottle of sports drink, 15 teaspoons of sugar.

Most orange juice doesn't have any added sugar, but it still counts towards your daily allowance. When you juice a fruit,



you're getting most of this sugar without much of the fiber or bulk. So a glass of juice can be packed with far more sugar than you might think. But how aware are you of this?

I would like you to put the amount of sugar in my little bowl that you think you might be in this drink? I want to say it's healthy because it's juice. But I know that there is sugar in juice. 2 teaspoons of sugar. 8! Unbelievable. Would you pick that up now? Do you think now? No!

But when it comes to sugar, what's the difference between eating oranges and drinking orange juice? Well, it has a lot to do with the amount of sugar you can consume in a very short time.

I'm back to meet Marty to find out more. Maybe in front of you, you have a liter of orange juice which is made from 12 oranges. And in front of you can you cap we have 12 oranges. And what we want you to do is we want you to well eat or drink what you've got in front of you, as much as you can. It's not a race. We just want you to eat or drink until you feel you've had enough. Okay?

So you ready. No way! You go you do like oranges. That's it. Done. Yeah! Maybe still, go, maybe still going except maybe you've drunk what 3/4 of a liter? Yeah. Juice and, Koneko, you've had one and a half, one and a half oranges. So what does that mean? What does that mean? What do you actually mean? Right. Well maybe you have just drunk approximately 18 teaspoons of sugar. Wow! Okay, okay. Whereas you have had maybe three three and a half, something like that, teaspoons of sugar in that.

And that's the thing. the reason you've managed to eat less is because the orange is full of fiber. As well is chock full of fiber, there's got two things it does. First of all it keeps you satisfied. It fills you up much more than the orange juice does. The thing is, you can't eat as much of oranges as you

can orange juice. I mean, you couldn't eat nine oranges just cuz you don't know. And the second thing it does is, it actually makes the sugar that you have eaten release very slowly into your blood.

Okay, so there are benefits. Despite the fact that fruit has got sugar. There are benefits for eating fruit. Definitely.

Fruit is full of fiber, vitamins. It's great for you. Fruit juice on the other hand, you were just, you know, in moderation it's good for you. But just be aware of the sugar that's in it. So without realizing it, not only has Meggie managed to drink five times the sugar that Nica has eaten. It'll get into her bloodstream super fast, causing a sugar rush.

The copper box arena in London's Olympic Park. Two net ball teams are helping us with a fascinating experiment which gets to the very heart of the truth about sugary drinks. Their effect on appetite. Some drinks can have as many calories in them as a meal. But will these liquid sugar calories fill you up like eating food will?

Dr. Jason Gill from the University of Glasgow Medical School is going to help me find out. So what's the experiment about? The experiment today's all about sugar in drinks. I've got two netball teams here we're gonna give one of them a drink with sugar after the half of the game. And we're gonna give the other group a sugar-free version with the same drink. And then we're gonna give them an all-you-can-eat buffet and see how much food they choose to eat.

About the team that's given the drink with sugar in with therefore it the less food that's that's what you'd think we're gonna see whether that's actually the case. Do they eat fewer calories because they've already consumed some? Kind of reason to drink beforehand. So we've got the red ones for the red team and the blue ones for the blue team. And all I want

you to do is take a bottle and drink all of it before you leave the court. If you'd like to help yourself what the red team doesn't know is that their Gosling sugary blackcurrant squash, which is packed full of calories. The blue team equally unknowing are drinking no calories at all.

But will the red team assume you all those extra calories through drink eat less than the team that has had zero? When the girls have had their fill, they're asked to leave the room.

And while they're out we carefully weigh everything left on the table to calculate the amount of calories each team has consumed. They're in for a shock. We gave you these two drinks beforehand but you didn't know that this drink had sugar in it. And that was a sugar-free version of the same drink. And then we had to have this buffet. And we weighed out all the food beforehand. We weighed out what you ate the end. And we calculated how many calories you consumed. And this table consumed a thousand calories in total more than this table. And that's entirely because if they should give content in the drink that's the difference. You have the difference is the sugar in the drink.

It so what happens is when you drink the sugar in the drink you consume the calories very easily. Your body doesn't really sense them very well. So they don't make you feel full. So when you go to eat, you don't eat any less food because the calories don't make you feel full from the drink you have beforehand.

So what does that mean? Well, we know that sugar sweetened drinks are a big determinant of obesity. The fact that you're drinking lots of these drinks is one of the big things that's responsible for the fact that we're all getting fatter, particularly children. People who have lots of sugar in their diets do tend to put on weight. And that's partly because the calories in sugary things, especially sugary drinks, aren't

the best for making you feel full. So you're more likely to carry on eating. And therefore take on more calories.

## **Alternatives to Sugar**

Simon used to down up to seven cans of fizzy drink a day. And the calories in them have been a contributing factor to him developing fatty liver disease. He's been trying to go cold turkey and not drink any fizzy pop at all. But he appears to be having withdrawal symptoms. Have been a bit more tired than usual. But, Alex, but that's probably more likely to do with the fact that I'm not wired permanently from sugar which I was clearly. I feel a little bit on edge at the minute, twitchy, sort of. Yeah. My attention span isn't as good.

And Simon isn't alone. With his habit your average Brit gets through 50 litres of sugary drink in a year.

So I'm back at Leatherhead food lab to see what that really means and whether there's an alternative. This is what 50 liters of water looks like. And this is the amount of sugar you have to add to make it as sweet as your average soft drink. Nearly five and a half kilos.

Oh my goodness. All that sugar. Yeah. That's sweet. Feeling it sticking to my teeth.

We're going to swap that tub of water for another one. Now let's try an experiment, Okay? So we have the same amount of water here. And I'm going to put in 10 grams of this artificial sweetener, sucralose. So I'll chuck it in and see what it tastes like. Mixing up, right.

Alice it's time for us to taste this strange concoction. And, yes, yours that's definitely as sweet as the sugar one. And yet all that sugar that went into the other one five point four kilos and ten grams of your artificial sweetener. Ten grams of the sucralose. That's because it's 500 times sweeter than the sugar that we used. But the only thing that would

make alarm bells ring with a lot of people is it is an artificial sweetener. Along with artificial sweetness comes all sorts of stories of it links to our health.

Well it is a sweetener. But all of the sweeteners are rigorously tested and they're very tightly regulated. They are tested and tested and tested. And it takes years to develop a sweetener for using in food. So we have to be very, very sure that they are safe to use in food before we'd be allowed to use them. Artificial sweeteners undergo meticulous testing by scientists. Which is then reviewed by the European Food Safety Authority before they can be used in food and drink. And leading scientific groups like Cancer Research UK say there's strong evidence that they are safe for humans.

Although the debate rages on. The science seems to indicate that the 20,000 calories consumed by the average Brit in a year from sugary drinks are much more likely to cause you health issues than a tiny amount of replacement sweetener.

## **The Results Are In**

Our four volunteers are reaching the end of their low sugar diet. And they're coming up with their own solutions. Former fizzy drink junky Simon has been trying out fruit teas and flavoring water with large chunks of fruit. Eventually, through trial and error, he's made the breakthrough: lemon mint. It is really really refreshing it tastes like a sensation compared to normal water. Just by cutting out the fizzy drinks Simon has dramatically reduced his sugar intake and he thinks he can feel the benefits already. When your pants are falling down in public that's a good sign.

If they've lost weight, and that has happened. Audrey has become the home-cooking queen, preparing everything she eats from scratch and using the internet to track down more sugar-free fast food like do-it-yourself hummus. Basically, you just open the kind of chickpeas have a few things to it and put it

in a blender. Totally homemade hummus. So it's absolutely delicious.

Rick is doing well. He has completely stopped eating sugary treats during the day. But is consoling himself with a bit more nighttime cheer, relaxing down the pub over a couple of pints and hoping he'll still make the grade.

And self-confessed sugar addict, Cara: she's cut out the biscuits, the cake, and sweets through sheer willpower. There is gonna be things that come up like Noah's birthday where I'm gonna have cake and I'm gonna have sweet stuff. But I can deal with those days now. Whereas before so that would have been every day rather than just one day.

After six weeks our low-sugar experiment is over and my volunteers are back at Newcastle University for the same series of tests they had at the start. Rick has gone from eating 29 teaspoons of sugar a day to seven, narrowly missing out on his six a day target. But still well within current guidelines. Kalra, however is down from 28 teaspoons a day to just 3. Audrey, from 23 teaspoons to 1/4 of a teaspoon. And Simon has gone from a massive 39 teaspoons of sugar a day to just a quarter of a teaspoon.

All four were at risk of heart disease and type 2 diabetes. So what is their new low sugar regime done to their health? Cara and Audrey's results are very similar. The headline of it all is that you've lost just over six kilos in weight, or just over a stone, right. So you've lost about five kilos which is nearly a stone. So well done. The changes that you've made to your diet by reducing sugar have substantially reduced your risks of conditions like heart disease and type 2 diabetes. As well as the wonderful things that it's done for your metabolism. When you first came through we were looking quite a lot at how your body was processing with sugar. And I'm pleased to be able to tell you that from the blood sugar results that we've taken you've improved hugely, which is

releasing a lot of the stress on your pancreas. So, Cara and Audrey have dramatically improved their health by cutting back on sugar.

Rick, however, despite not eating any Indian sweet hasn't lost any weight at all. Rick, you have substantially reduced the amount of sugar you take in from 29 spoonfuls down to seven, but at that same time you've increased your alcohol intake. And so any benefits you would have had from reducing your sugar are taken away because you're taking in more alcohol.

The volunteer Mike was most concerned about was Simon. He was showing signs of potentially fatal fatty liver disease. His challenge was the greatest of all. You've managed to lose just over six kilos, which is just over a stone. Well, good. Now I'm pleased to tell you that the markers that we had for fatty liver disease have gone down by 40 to 70 percent. Good. That was the most. That was the most concerning thing, and I couldn't be prouder of him. Well, don't you much it's been a huge challenge. But for all four of our volunteers, it's just the start of a whole new lifestyle.

I'm really proud of myself and I'm definitely gonna continue with it. It's now work risking my health um a bar.

You just got to be a little bit more aware and not given that the peer and social pressures. I know its just something I really need to do. Obviously I have a long way to go, but because the first steps are the most difficult ones, I'm already moving that way. So I'll continue.

If you were to come back and see me in the next time I would be half the man I am now.

I've actually gone down two dress sizes. I don't mind going shopping and buying new clothes. And I absolutely have no problem putting in the charity bag because I'm never gonna wear them again because I'm never going to be like that again.

The truth about sugar is that it can pile on the pounds. Frighteningly quickly. And all that extra weight can lead to a whole host of very serious health problems. It isn't the only culprit. Too much of most foods will make you fat. But I think sugar is the thing many of us tend to binge on. Your body craves it. And it often doesn't fill you up. While most things we know are okay in moderation, with sugar, we really do seem hardwired for excess. So, sorry, but this time you really can't have your cake and eat it.