

# Sugar and cancer – what you need to know

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There's a lot of confusing information and advice out there around sugar.

It's been made [the villain of our diet](#), but where does the consensus lie between how [sugar](#) and [cancer](#) are linked?

Does it cause cancer? Does sugar feed cancer [cells](#), making them grow more aggressively? And how does the sugar we consume through food and drink affect our health, and what can be done about this?

In this post we're taking a long hard look at sugar.

We'll focus specifically on sugar and cancer, busting some myths and covering what researchers are studying in the hopes of finding new ways to treat people with cancer.

And we'll cover why the amount of sugar in our diets is cause for concern. A high-sugar diet can be bad news when it comes to cancer risk, but not for the reasons that often appear in the headlines.

But first the basics, what our bodies need sugar for and where it comes from in our diet.

## **Glucose – the fuel of life**

Search for sugar and cancer on the internet and it doesn't take long to find alarming warnings that sugar is the "white death" and "cancer's favourite food".

But this idea that sugar is responsible for kick-starting or fuelling a cancer's growth is an over-simplification of some complicated biology. Let's start with what sugar actually is.

Sugar comes in many different forms. The simplest form is just as a single molecule, such as [glucose](#) and fructose. These molecules of simple sugars can also stick together, either in pairs or as longer chains of molecules. All of these combinations of molecules are carbohydrates, and are our body's main source of energy.

The form of sugar most of us will be familiar with is [table sugar](#), which is a simple sugar that dissolves in water and gives things a sweet taste. Its proper name is sucrose, and it's made up of crystals of glucose and fructose. Table sugar is refined, meaning it's been processed to extract it from a natural source (usually [sugar beet](#)). Unprocessed foods can be high in simple sugars too, for example honey (also made mostly of

glucose and fructose) is nearly pure sugar.

As chains of sugar get longer, they lose their sweet taste and won't dissolve in water anymore. These chains are called polysaccharides and form a large component of starchy foods. Starchy foods such as rice, bread, pasta and vegetables like potatoes might not taste sweet, but they are high in carbohydrate too.

Sugar, in some form, is in many things we eat. And this is good, because our bodies rely heavily on it to work.

Nearly every single part of our body is made of living cells. And it's these cells that help us see, breathe, feel, think and much more.

While their jobs in the body may differ, one thing all these cells have in common is that they need energy to survive and perform their duties.

Cells somehow need to turn nutrients in our diet into a form of energy that they can use, called ATP. It would take a long time to explain this (if you're interested you might want to read more), but simplistically the process starts with glucose.

Glucose is the basic fuel that powers every single one of our cells. If we eat or drink things that are high in glucose, such as fizzy drinks, the glucose gets absorbed straight into our blood ready for our cells to use. If a starchy food, such as pasta, is on the menu, the enzymes in our saliva and digestive juices break it down and convert it into glucose. And if for some reason there's no carbohydrate in our diet, cells can turn fat and protein into glucose as a last resort, because they need glucose to survive.

It's here that sugar and cancer start to collide, because cancer is a disease of cells.

## Sugar and cancer

Cancer cells usually grow quickly, multiplying at a fast rate, which takes a lot of energy. This means they need lots of glucose. Cancer cells also need lots of other nutrients too, such as amino acids and fats; it's not just sugar they crave.

Here's where the myth that [sugar fuels cancer](#) was born: if cancer cells need lots of glucose, then cutting sugar out of our diet must help stop cancer growing, and could even stop it developing in the first place. Unfortunately, it's not that simple. All our [healthy cells](#) need glucose too, and there's no way of telling our bodies to let healthy cells have the glucose they need, but not give it to cancer cells.

There's no evidence that following a "sugar-free" diet lowers the risk of getting cancer, or boosts the chances of surviving if you are diagnosed.

And following severely restricted diets with very low amounts of carbohydrate could damage health in the long term by eliminating foods that are good sources of fibre and vitamins.

This is particularly important for cancer patients, because some treatments can result in weight loss and put the body under a lot of stress. So poor nutrition from restrictive diets could also hamper recovery, or even be life-threatening.

## A sticky end for sugar research?

Although there's no evidence that cutting carbohydrates from our diet will help treat cancer, important research has shown that understanding the abnormal ways that cancer cells make energy could lead to new treatments.

Back in the 50s, a scientist called Otto Warburg noticed that cancer cells use a different chemical process from normal cells to turn glucose into energy.

Healthy cells use a series of chemical reactions in small cellular 'batteries' called mitochondria. The Warburg Effect, as it was dubbed following Otto's discovery, describes how cancer cells bypass their 'batteries' to generate energy more rapidly to meet demand.

This shortcut for making energy might be a weakness for some cancers that gives researchers an advantage for developing new treatments.

Firstly, it opens up the potential for developing drugs that shut down cancer cells' energy-making processes but don't stop healthy cells making energy. And researchers are testing drugs that work in this way.

Secondly, the abnormal processes in cancer cells can also leave them less able to adapt when faced with a lack of other nutrients, like amino acids. These potential vulnerabilities could lead to treatments too.

But these approaches are still experimental, and we don't know yet if treatments that starve cancer cells are safe or if they work.

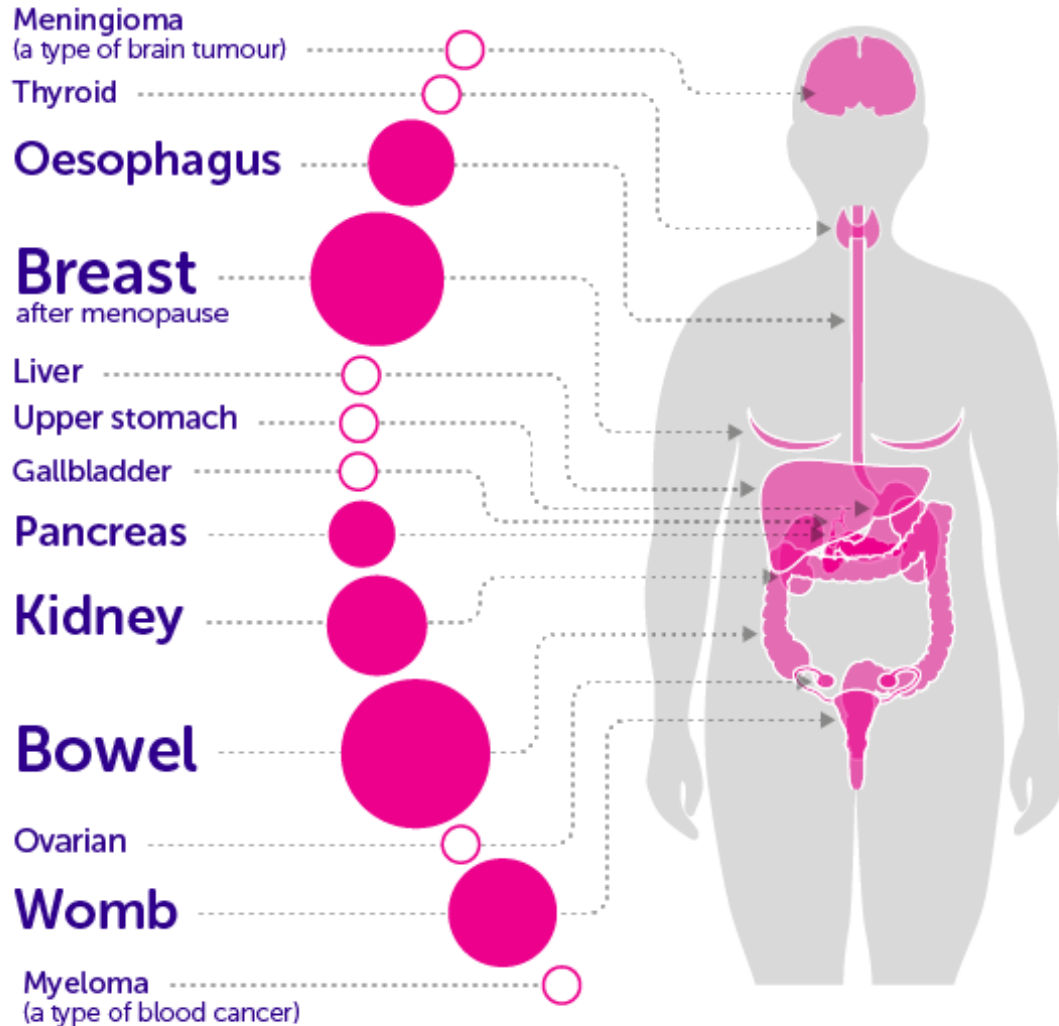
It's certainly not grounds for cancer patients to try and do it themselves by restricting their diet during treatment – and going back to our earlier point, it could be dangerous to do so.

**If sugar doesn't cause cancer, why worry about it?**

# BEING OVERWEIGHT CAN CAUSE 13 TYPES OF CANCER

●●● Larger circles indicate cancers with more UK cases linked to being overweight or obese

○ Number of linked cases are currently being calculated and will be available in 2017



LET'S BEAT CANCER **SOONER**  
cruk.org



Credit: Cancer Research UK

Cutting out sugar doesn't help treat cancer, and sugar doesn't directly cause cancer. Why then do we encourage people to cut down on sugary foods in [our diet advice](#)?

That's because there is an indirect link between cancer risk and sugar. Eating lots of sugar over time can cause you to gain weight, and [robust scientific evidence](#) shows that being overweight or obese increases the risk of 13 different types of cancer. In fact, obesity is the single biggest preventable cause of cancer after smoking, which we've [written about](#) many times [before](#).

It's added sugar we're mainly concerned with when it comes to weight gain, not sugar that is naturally found in foods like fruits and milk or healthy starchy foods like wholegrains and pulses (which people should be eating more of).

## **How can I cut down on added sugar?**

The easiest way to lower your added sugar is to cut down on sugary drinks, which are the largest source of sugar in the UK diet.

Most sugary drinks, such as fizzy drinks and energy drinks, have more than the recommended daily maximum amount of added sugar in one serving alone. And while these extra calories promote weight gain, they offer no other nutritional benefits.

Other obviously sugary foods such as sweets, chocolate, cakes and biscuits are all best kept as treats too. But some foods that have hidden high amounts of added sugar may surprise you. Some breakfast cereals, ready meals (including 'healthy' ones), pasta sauces and yoghurts can have shocking amounts of sugar added to them. Reading nutrition

information labels and checking the ingredients list can help you choose lower sugar options.

While there are steps you and your family can take to cut down on added sugar, making these changes can be easier said than done. And it's here that governments need to lend a hand.

"Multiple cues push us as customers to stack junk food into our shopping baskets, even if we weren't planning to," says Professor Linda Bauld, our cancer prevention champion based at the University of Stirling. "That's why we want the Government to help create a better food environment where the healthy choice is the easy choice for everyone."

We're delighted that the sugar tax has just passed through the House of Commons. It could prevent millions of cases of obesity, therefore obesity-linked cancers in the future, by reducing the amount of sugar the nation consumes in fizzy drinks.

Another area [we're watching closely](#) is the government's plan to reduce the amount of sugar in the types of foods that are very popular with children.

## **No sweet endings**

The story about sugar and cancer is complicated.

On the one hand, sugar itself doesn't cause cancer, and there's no way (at the moment) of specifically starving [cancer cells](#) of glucose without harming healthy cells too.

There's also no evidence that adopting a diet very low in carbohydrate will lower your cancer risk or help as a treatment. And for patients, getting adequate nutrition is important for helping their bodies cope with



treatment.

But we're concerned about the amount of added sugar people are consuming because it's promoting weight gain. And being overweight or obese increases the risk of least 13 types of cancer.

So the take home message is that although banishing sugar won't stop cancer in its tracks, we can all reduce our risk of getting cancer by making healthy choices, and lowering the amount of added sugar in our diets is a good way to help maintain a healthy body weight.

Provided by Cancer Research UK

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