FACT OR FICTION: Does Sugar Really Feed Cancer?

The question of whether sugar feeds cancer cells is a big one and the media is all over it. Just look at the popularity of sugar-detox and sugar-free diets. These 'diets' exist under the illusion that eating sugar can cause or worsen cancer progression. Unfortunately, this common misconception has a lot of people totally avoiding all carbohydrate-rich foods in hopes of starving off cancer cells. In reality, though, sugar is actually an important source of fuel for our bodies.

So where does the sugar confusion come from? Let's take a closer look.

What is sugar, anyway?

We usually think of ‘sugar’ as that refined, powdery sweet stuff packed into candy, chocolate, soft drinks, and other processed foods. But there are many different types of sugar, and not all of them need to be avoided.
Sugar is a type of carbohydrate. Carbohydrates, fat, and protein are all macronutrients, the building blocks that our bodies need to stay healthy and strong. Carbohydrates come in two main forms, simple and complex carbohydrates.

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<th>Simple Carbohydrates</th>
<th>Complex Carbohydrates</th>
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<td><strong>Added Sugars:</strong> White sugar, brown sugar, honey, molasses, maple syrup, corn syrup, jams and jellies, soft drinks, fruit drinks, candy</td>
<td><strong>Natural Sugars:</strong> Starchy vegetables, leafy greens, whole grains, beans, lentils, peas</td>
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Table 1- Foods containing simple and complex carbohydrates.

Through digestion, our bodies transform the carbohydrates we eat into a simple sugar called glucose. Our bodies then use this glucose for cell maintenance, growth, repair, and immune system support. Glucose to our cells is like gasoline to a car. So, when you look at it this way, we absolutely need sugar.

Now I know what you’re thinking… ‘Hold up a minute, you’re telling me to eat sugar?!’ Before you leap to the cookie jar, let me explain.

**The importance of carbohydrates**

Carbohydrates (ahem…‘sugar’) support the functioning of all of the cells in our bodies (yes, this does include cancerous ones). For the typical Canadian, about 55% of our energy comes from carbohydrate-rich foods. One of the biggest problems of carb-restricted diets is the risk of being energy deficient. This can be a huge problem especially when we’re sick and have higher energy needs. And, even if we do starve ourselves of carbohydrates, our bodies will still find a way to make glucose from protein and fat. Not to mention, cutting out carbohydrates is difficult to maintain, can make us feel tired, and puts added stress on our bodies.
Figure 1- Sucrose, commonly known as table sugar, is made up of two sugar molecules.

In addition, our bodies have many systems in place to control how much glucose our cells get. If we have too much glucose, our bodies can pack it up for storage in the liver. If we have too little glucose, we unpack it so it’s ready to use. What does this mean? We can’t control how much glucose our cells get just by controlling our intake of carbohydrate-rich foods.

In Canada and the United States, we use AMDRs (Acceptable Macronutrient Distribution Ranges) that tell us what percentage of our total daily calorie intake should come from each macronutrient. For healthy children and adults, 45-65% of calorie needs should be met by eating carbohydrate-rich foods. So, for someone who eats 2000 calories each day, 900-1300 calories should come from carbohydrates.
All sugar is not equal

Where the whole confusion starts is with the type of sugar we should be eating. Sugars exist **naturally** in many of the foods we eat. Whole fruits, vegetables, milk, and whole grains are a few examples. Sugars can also be **added** to food to boost flavour, texture, and colour. A study of Canadian children and adults showed that we eat, on average, a total 110 of sugar (natural and added) per day. This is equal to about 26 teaspoons of total sugar.

So, what’s the difference between natural and added sugar? From a biochemical perspective, not much. All sugar that we eat is eventually broken down in our bodies and is absorbed into our bloodstreams as glucose to be used by our cells for energy.

But this doesn’t mean that a downing a tablespoon of white sugar is equivalent to snacking on a Granny Smith apple, even though both contain about 16 grams of total sugar. Nutritionally speaking, natural and added sugars are **quite different**.

**Figure 2**- Candy is just one example of empty calories, providing little or no nutritional value.
I’d like to introduce you to the empty calorie. Empty calories are those that provide little or no nutritional benefit, aside from giving your body a quick source of energy. Added sugars, like those found in soft drinks, fruit drinks, and sweets like candy, cookies, cakes, and pastries are often a source of empty calories. Plus, empty calories tend to be less filling, meaning we’re likely to overeat portion sizes in order to feel full.

**The end result?** Eating more added sugars than we need - and missing out on important nutrients found in a nutritious diet.

![Figure 3](image)

**Figure 3**- Complex carbohydrates, like vegetables and beans, provide us with vitamins, minerals, and fibre.

On the other hand, foods containing natural sugars are also high in vitamins, minerals, and fibre. To fuel your body, opt for milk, vegetables, fruits, beans, legumes, and whole grains. These foods do contain some sugars naturally, and they all have a place in a balanced, nutritious diet.
Key Takeaway: Quality Counts! Kick those processed snacks and sweets to the curb, and opt for hearty, wholesome foods to give your body the energy boost it needs - without the added sugars.

What we know about the sugar-cancer connection:

When we eat, our body breaks down our food to use as energy. In order for our cells to use this energy, we need a hormone made by the pancreas, called insulin. Insulin acts like a key to unlock our cells and let energy in.

The more carbohydrates we eat, the more insulin our pancreas will produce... it's a give-and-take relationship. However, research suggests that high insulin levels in the blood may be a risk factor for tumour growth (Klemet et al., 2011; Parek, 2009). This may be due to higher production of a growth factor, called IGF1, which is produced in greater quantities when insulin levels are high (Cohen, 2012).

What we don’t know yet is whether high insulin levels impact cancer cell growth on its own, or whether it’s more complex than that. In other words, the sugar-cancer relationship isn’t fully understood. Is it the sugar that we’re eating that can single-handedly feed cancer cells? Maybe, maybe not. There are many factors like overweight, obesity, and insulin resistance that must first be studied before we can support the ‘sugar causes cancer’ claims.

On the flip side, what we do know is that eating in excess puts us at greater risk for becoming overweight or obese. In addition, a recent systematic review suggests a positive relationship between obesity and risk for certain types of cancer, cancer recurrence, and death related to cancer (Goday, 2015). So what does this mean? Eating too much sugar may indirectly affect our cancer risk.

The Bottom Line: Research shows a relationship between obesity and certain types of cancer, but we still don’t know whether there is a direct connection between the sugar we eat and cancer cell growth.
How much added sugar should you eat?

The quick answer: as little as possible. Dietary guidelines on added sugars vary quite a bit. The American Heart Association recommends limiting added sugars to no more than 6 teaspoons per day for women, or 9 teaspoons per day for men (Johnson et al., 2009). To put this in perspective, a 355mL can of pop has about 10 teaspoons of sugar.

Both the Heart and Stroke Foundation and the World Health Organization (WHO) recommend we limit consumption to less than 10% of total energy. For a 2000 calorie diet, this is about 12 teaspoons or sugar per day. The WHO says for added health benefits, we should keep this amount under 5% of total calories, or 6 teaspoons of added sugar.

The Take Away: Where does your sugar come from? Take a look at your diet. If you’re eating a lot of foods with added sugar, you might be missing out on a whole lot of nutrients important for overall health, and putting yourself at risk of weight gain.

Sugar Feeds Cancer: Fact or Fiction?

By now, hopefully you see that this claim is only partially true. Sugar is used by all the cells in our bodies, including cancer cells, for energy. And unfortunately, we can’t selectively starve our cancer cells without also starving the healthy ones.

The type of sugar we eat, however, may indirectly influence our cancer risk. By consuming more energy than our bodies need, we are at greater risk for becoming overweight or obese. Eating foods with high amounts of added sugars is one way we can overeat.

Speak with your health care provider before making changes to your diet. For more information about nutrition before, during, and after cancer treatment, speak with your registered dietitian, or visit eatrightontario.ca.
References:


