



SUGAR

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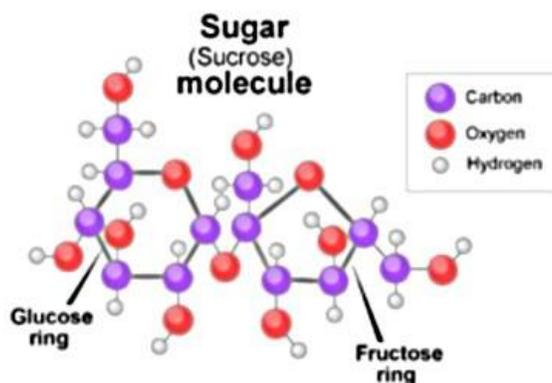
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Okay, I admit it, I'm a junk food addict! Yes, I like a few cookies or a doughnut with my coffee in the morning, a peanut butter and jelly sandwich once in a while, and I just can't go to bed without a big bowl of ice cream. You might be thinking that this is a lot of sugar and I probably have sugar diabetes and weigh over 300 pounds. Well, in this article we are going to learn a few things that might dispel some myths about sugar. Based on this information, I will decide whether or not to cut back on my sugar intake.

WHAT IS SUGAR?

For all you Chemistry majors, the sugar molecule structure is on the right. It is the generalized name for sweet, short-chain, soluble carbohydrates, many of which are used in food. They are carbohydrates, composed of carbon, hydrogen, and oxygen.

For the rest of us, I will explain what sugar is in terms that most of us can understand.



Sugar is a natural ingredient that has been part of our diet for thousands of years. Sugars are carbohydrates that provide energy for the body. The most common sugar in the body is glucose which your brain, major organs and muscles need to function properly.

Some sugars are found naturally in foods (e.g. fruit, vegetables and milk) while others are used during processing and cooking. The body does not distinguish between the different types of sugar and breaks them down in exactly the same way. For example, the sucrose in an apple is broken down in exactly the same way as the sucrose in your sugar bowl.

The most common kinds of sugars are:

- 1. Sucrose is often called table sugar. Made up from glucose and fructose, it is extracted from sugar cane or sugar beet and also naturally present in most fruits and vegetables.**
- 2. Fructose and glucose are found in fruits, vegetables and honey.**
- 3. Lactose is commonly called milk sugar because it is found in milk and dairy products.**
- 4. Maltose or malt sugar is the least common sugar found in nature. It is present in germinating grain and in a small proportion in corn syrup.**

Sugars in your kitchen cupboard include:

- 1. Granulated sugar – a traditional sugar used on your cereal and for cooking.**
- 2. Caster sugar – a little bit finer than granulated sugar, caster sugar is perfect for making cakes.**
- 3. Icing powdered sugar – used for dusting cakes and desserts and making butter icing.**
- 4. Demerara sugar – a brown sugar with a coarse texture that is great for crumble toppings.**
- 5. Light brown sugar – often used to make fruit cakes and puddings with a fuller flavor.**
- 6. Muscovado sugar – is a type of partially refined to unrefined brown sugar with a strong molasses content and flavor.**

WHERE DOES SUGAR COME FROM?

Sugar can be made from two main sources, either sugar cane or sugar beets.

Sugar Cane



Sugar Cane Fields



Cane is taken to Processing Plant



Sugar Cane ready for Refining



Sugar Cane Fields are Burned

Its history of introduction into Western Europe is traced back to the early growth of sugar cane prior to the 6th century B.C.E. in Polynesia. The plant is thought to have then been grown in India in the beginning of the 5th century B.C.E, where Emperor Darius of Persia discovered it and spread it throughout the Arabic world.

Europeans didn't discover sugar until the Crusades brought them into contact with Arabic culture. They referred to it as the new "spice," and its use was primarily restricted to the extremely wealthy. A pound (0.45 kg) of sugar was prohibitively expensive for most people.

Early sugar from the cane went through a refining process in Italy, and when Columbus left on his travels, he reportedly took the plants with him, which were then established in the Caribbean. The climate of Caribbean islands lent itself perfectly to the plant's growth, since it is best grown in tropic or near tropic temperatures. This increase in the ability to grow lots of sugar cane gradually led to the establishment of plantations throughout the Caribbean.

End of Sugar in Hawaii

Hawaii's last sugar plantation is getting out of the sugar-growing business, signaling the end of an industry that once powered the local economy and lured thousands of immigrants to the islands. Alexander & Baldwin Inc. said that it will phase out sugar by the end of 2016. Its 36,000 acre Maui plantation will be divided into smaller farms to grow biofuels and food crops. Some of the land will be irrigated to supply pasture to local cattle ranchers. The company says all 675 people who work for its Hawaiian Commercial & Sugar subsidiary will be laid off. About half will be retained through the end of this year's sugar harvest.

Alexander & Baldwin was founded by sugar-growing descendants of Protestant missionaries 145 years ago. Sugar and pineapple plantations run by big landowners once dominated Hawaii's economy. Sugar in particular took off after 1876 when Hawaii, which was still a monarchy at the time, won the ability to export the commodity to the United States duty-free. Plantation owners later played a prominent role in running Hawaii after the U.S.-backed overthrow of the Hawaiian Kingdom. Plantations remained the islands' economic engine until the launch of passenger jet travel shortened the length of flights from the West Coast and triggered a tourism boom.

The plantations drew immigrants from China, Japan, Korea, the Philippines, Portugal and elsewhere to work in the fields, giving Hawaii the ethnic diversity still evident today. The sugar company said it suffered \$30 million in agribusiness losses last year and expected further red ink if no changes were made. The entire property is zoned for agriculture, and the company plans to keep it that way.

Sugar Beets

“The beet-root, when being boiled, yields a juice similar to the syrup of sugar. A 16th-century scientist, Olivier de Serres, discovered a process for preparing sugar syrup from the common red beet. However, because crystallized cane sugar was already available and provided a better taste, this process never caught on. This story characterizes the history of the sugar beet. The competition between beet sugar and sugar cane for control of the sugar market plays out from the first extraction of a sugar syrup from a garden beet into the modern day.

The use of sugar beets for the extraction of crystallized sugar dates to 1747, when Andreas Sigismund Marggraf, professor of physics in the Academy of Science of Berlin, discovered the existence of a sugar in vegetables similar in its properties to that obtained from sugarcane. He found the best of these vegetable sources for the extraction of sugar was the white beet. Despite Marggraf’s success in isolating pure sugar from beets, their commercial manufacture for sugar did not take off until the early 19th century.



Sugar Beet Field



Sugar Beet coming out of Ground



Sugar Beets



Sugar Beets at the Processing Plant

Sugar Cane versus Sugar Beets – What sugar is best?

Cane sugar is processed through a long process. First the juice is extracted from the sugarcane, and is then purified with lime and heat. Then it is further processed, and it eventually separates into sugar crystals and molasses. The sugar crystals are bleached and refined to give the end product, which we buy at the supermarket. This is the traditional white sugar.

Beet sugar, on the other hand, has a more simplified process of extraction and production of sugar. The sugar beets are sliced, boiled and pressed down to a thick syrup. The sugar is then extracted from the syrup and dried. The production process of beet sugar is considered to be one-layer process, as it only requires one treatment at a single plant. The production of cane sugar, on the other hand, requires two different processes and at two different facilities.

Hence, beet sugar is simpler and effectively cheaper to produce than cane sugar. Furthermore, sugar beets have a composition of 16% to 18% sucrose, as compared to a 10% to 11% composition of sugarcane. Basically, the same amount of sugar beets will produce more sugar than the same amount of sugarcane.

Also, growing sugar beets is easier than sugarcane. Sugarcane can be very temperamental and requires the right tropical climate to grow, whereas sugar beets are not so. They can grow in a variety of temperate climates, even with cold winters. This gives some countries the option of producing sugar inland, as opposed to importing expensive cane sugar.

Other than these said differences, there are no notable differences between the two. In fact, many producers often switch the source of sugar between beets and cane, and sell them in the same packaging, while the consumers are none the wiser. Both, beet sugar and cane sugar have the same physical look. They are both 100% saccharose (sucrose), with the same chemical makeup. They are 99.95% similar to each other, and people have different opinions about whether or not this 0.05% matters or not. Most people cannot tell a difference, while some (especially bakers and chefs) claim that the cane sugar is better for baking as the end product is softer, chewier and sweeter.

It seems that Cane Sugar is a little better than Beet Sugar.

HEALTH EFFECT “MYTHS” OF EATING SUGAR

1. Obesity and diabetes



Eating excessive amounts of sugar does not directly increase the risk of diabetes, although the extra calories can lead to obesity, which may itself increase the risk of developing this metabolic disease. Recent studies have shown unequivocally that consumption of sugar-sweetened beverages increases body weight and body fat.

2. Tooth decay

Sugar doesn't cause tooth decay or rot your teeth. Surprised to hear that? Tooth decay is caused by acid-producing bacteria in your mouth that feast on carbohydrates, be it sugar from candy or starch from wholesome foods such as bread.

3. Cardiovascular disease

Excessive sugar consumption can cause weight gain. Weight gain, combined with sustained high insulin levels, can lead to insulin resistance and diabetes—which can increase your risk of cardiovascular disease.

4. Hyperactivity

Many concerned parents and health organizations believe there is a link between a child's diet and behavior. The myth or notion that food can have an effect on human behavior has been proven false.

5. Raised blood glucose levels

It used to be believed that sugar raised blood glucose levels more quickly than did starch because of its simpler chemical structure. However, it turned out that white bread or French fries have the same effect on blood sugar as pure glucose, while fructose, although a simple carbohydrate, has a minimal effect on blood sugar levels.

6. Alzheimer's disease

There is no evidence of a sugar–Alzheimer's disease connection.

7. Sugar Addiction



Some people use sugary foods in ways that aren't healthy, even though it probably is not an actual addiction. Some people like Jelly Beans and eat them all the time. There are many eating disorders. I eat ice cream because I like it – addiction or not!

MORE BADMOUTHING AND BASHING SUGAR



There are some “so-called” experts that claim sugar is a toxic poison. They say that eating sugar is worse for you than smoking tobacco or even snorting cocaine.

These people are a bunch of idiots!! Don't listen to them.

Sugar is needed for the creation of muscle in the body and it is the primary energy source that your body and brain needs to function properly.

SUGAR FACTS AND STATISTICS

- **One teaspoon of sugar (or 1 sugar cube) = 4 grams**
One gram of sugar = 4 calories
One teaspoon of sugar (or 1 sugar cube) = 16 calories
- **The American Heart Association recommends that adult women eat no more than 24 grams, or 6 teaspoons, of added (beyond naturally occurring sugar) sugar and men no more than 36 grams, or 9 teaspoons, per day. The current average is over 30 teaspoons of sugar per day.**
- **One teaspoon of white sugar has 16 calories and one teaspoon of corn syrup (a type of sugar) has 20 calories.**
- **To find the amount of calories from sugar in a product, multiply the grams by 4. For example, a product containing 15 grams of sugar has 60 calories from sugar per serving.**
- **Soft drinks are responsible for most of the added sugar in the average American diet.**

- The average American consumes 53 gallons of soft drinks per year.
- Worldwide, people consume 500 extra calories a day from sugar, which is roughly the amount of calories needed to gain a pound a week.
- Americans eat 10 times more sugar than all other food additives—except for salt.
- The average American consumes 3 pounds of sugar each week—or 3,600 pounds in an entire lifetime which is enough sugar to fill an industrialized dumpster.
- A calorie with little or no nutritional value is an empty calorie.
- The only taste humans are born craving is sugar.
- The body breaks down all sugars and starches to glucose. The brain requires around 130 grams of glucose each day to cover basic energy needs.
- In the 16th century, a teaspoon of sugar cost the equivalent of five dollars in London.
- A 32 oz. Gatorade bottle has 36 grams of sugar, which is like eating 5 Reese's Peanut Butter Cups.
- A 23 oz. bottle of Arizona Green Tea has about 51 grams of sugar, which is about the same as eating 20 Hershey's Kisses.
- A Grande Starbucks Iced Flavored drink has about 28 grams of sugar, which is the same amount of sugar in 3 Krispy Kreme donuts.
- One 12 oz. can of Coke has 10 teaspoons of sugar, which is more sugar than 2 frosted Pop Tarts and a Twinkie combined.
- More than half of the 8.4 million metric tons of sugar that is produced in the United States each year comes from sugar beets.
- Brazil is the world's largest producer of sugar cane sugar.
- Russia is the world's largest producer of sugar beet sugar.
- India is the world's largest consumer of sugar.

COMPUTING MY SUGAR INTAKE

Alright, the moment of truth has arrived. It is time to compute the average amount of sugar my body needs per day against the average amount of added sugar I consume each day.

"Cut back on added sugars" is a familiar health recommendation but until now, there has been no frame of reference on whether you're eating too much, and how to cut back. The new FDA proposal, based on a review of the current scientific data (similar to that used for the 2015 Dietary Guidelines for

Americans Advisory Group) provides a guideline for daily added sugar intake: 10 percent of daily calories consumed.

For an average person consuming 2000 calories, this is about 200 calories per day (or 50 grams or about 12 teaspoons of sugar a day).

Here's how to translate from calories to grams to teaspoons. Use the "divide by 4" rule of simple sugar math. Take the calories and divide by 4 to get the grams of added sugar. For 200 calories, this is 50 grams. And for teaspoons? Divide by 4 again to get around 12 teaspoons of added sugars daily. Depending on your daily calorie intake, a recommended added sugar intake can range from 6 teaspoons to 18 teaspoons a day.

Since I'm a moderately active big (6 foot 4 inches – 230 pounds) man, the recommended number of calories my body needs each day is about 2800 calories. Let's do the math to determine the maximum amount of sugar I should be consuming each day.

1. 10% of daily calories consumed: $.10 \times 2800 = 280$ calories from added sugar
2. Divide sugar calories by 4 to get number of grams: $280 / 4 = 70$ grams
3. Divide grams of sugar by 4 to get the maximum number of teaspoons: $70 / 4 =$ about 17 teaspoons of sugar a day.

Okay, we now know my maximum added sugar numbers:

Calories	=	280
Grams	=	70
Teaspoons	=	17



I just found out something that is going to help my sugar numbers. There is no sugar in beer!! The sugar content of your favorite alcoholic beverage just may surprise you. Alcohol can be a significant source of calories and carbohydrates, but most types have little or no sugar.

My Added Sugar Chart for an Average Day

Possible Sources of Added Sugar	Grams	Calories
<u>Breakfast</u>		
Coffee (Black)	0	0
Bowl of Cereal	15	60
Toast with Butter and Jelly	10	40
Orange Juice	15	60
<u>Snack</u>		
Doughnut or Cookies	12	48
Glass of Milk	12	48
<u>Lunch</u>		
Sandwich with Chips	4	16
<u>Dinner</u>		
Steak – Potatoes – Vegetables	2	8
Beer	0	0
<u>Snack</u>		
Ice Cream (3 scoops)	36	144
My Totals	106	424
Recommended Max Added Sugar	70	280
Exceed the Max by	36	144

CONCLUSIONS



Pecan Ice Cream

Based on this little exercise, it seems that I need to cut back on my sugar intake. I might be able to cut out the morning snack and only have 2 scoops of ice cream at night. Yes, that should put me closer to where I need to be. But, on second thought, at this point in my life, I don't have many "guilty" pleasures. So, I'm not giving up any of my snacks or ice cream! Maybe I will get a little more exercise.

If "Junk Food" and sugar were so bad for you, I would have been dead a long time ago. And by-the-way, I don't have diabetes and I don't weigh over 300 pounds. I'm 75 years old, still working, and still healthy!!

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