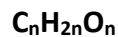


Y3/ Fall/ Week 13/ Sugar



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Introduction and definition

Sugar has been a topic I've long wanted to do research in, especially when I have a very sweet tooth and like snacks like chocolate. I discovered that on days I consumed much sugar, my body tends to react with inflammation, and sometimes sugar rush would make me extremely drowsy and unable to work, despite the euphoria at the moment after consuming food of high sugar. Finally have more mental capacity to ponder, I decided to write a passage about sugar.

Let's first define sugar:

- Sweet-tasting, soluble carbohydrates
- Consists of
 - (1) Simple sugars (monosaccharides, e.g. glucose, fructose)
 - (2) Compound sugars (sucrose, lactose, maltose...)

Polysaccharides are NOT regarded as sugars, but can be hydrolysed into sugars.

Why is sugar essential for life, and why we crave for it?

There is no doubt that sugar is essential for life, as our body breaks down them into water and carbon dioxide for energy by glycolysis:



Longer chains of polysaccharides eventually get digested (by hydrolysis) into simple sugars, and released to our bloodstream. As we are in constant need of energy, we need a steady supply of blood sugar to keep ourselves energetic to carry out things we want to do; the speed of release of sugar in bloodstreams depend on the complexity of the sugar molecules.

The spike in blood sugar levels in normal situations would also lead to the release of dopamine – this effect is especially significant in repeated instances of intaking doses of sugar. As dopamine triggers our brain's reward pathway, making us feel motivated and more satisfied by the thought of consuming more sugar and feeling the sweet taste – and likely reinforce that habit. An experience about sugar consumption on rats discovered that over 21 days of intermittent access of sucrose consumption (under dependence) increased their sucrose intake and baseline dopamine levels by 100+% compared to the beginning of the experiment.

Years of crave for sugar rush and technological advancement propelled society to develop the methods of extracting sugar from sugar canes and sugar beet. Throughout decades of expertise in extracting sugar and businesses' incentives on adding more sugar to humans' diets and soft drinks to make their products more attractive in taste, we have seen a huge increase in sugar demand and daily sugar intake among global societies – US, for instance, has an average person consuming 156 lbs of added sugar a year, and 500% more soft drinks than they did in 1940s. It seems that sugar has cemented its position in creating the sense of reward to us, with the perception of sweetness and energy bursts.

Blessing to brain, curse to body

While our brain loves sugar, our body generally doesn't despite it being a good source of energy – especially when sugar intake is elevated.

An elevated blood sugar level triggers insulin response: insulin is released by pancreas to help blood sugar enter muscle, fat and liver cells – for later energy use, but insulin itself also triggers inflammation. When blood sugar level decreases, the pancreas would be signaled to stop producing insulin. This has been the primary method of how our ancestors stored their energy when threats of hunger are still present thousand years ago – they lived well by embracing in unrefined diets.

But what about... even more sugar? Consistently high levels of blood sugar (hyperglycemia) could render cells more resistant to insulin, which in turn develops to Type II diabetes over time. The oversupply of energy could also easily result in central obesity, substantially increasing the likelihood of complications. What appears pacifying to the brain in the short term ends up bringing long-term problems to our physical selves.

Mental sugar

The way we experienced life is similar - we crave for motivation to live the purpose of life well. But when there are too many signals and stimulus, we simply find them too overwhelming – things usually don't go very right. We are constantly exposed to entertainment and perceived "rewards" (that make our neurons excite), but rarely had time to reflect on ourselves and just go a bit slower.

Think about the modern concepts like consumerism, hedonism and staying connected to everyone with social media – advocating us to "enjoy life", that makes us become mentally overstimulated. Our moods crash when isolated from those events, as we get accustomed to the consistently high level of feeling "fulfilled" and more depressed when we experience the lows. Eventually, we crave for happiness and simply try to avoid the hardships or the "less desirable" challenges. Our happiness tend to be short-lived, analogous to stimulus by short, simple sugars. Is this really healthy?

Love as a form of bittersweet sugar

Unfortunately, the feelings of overdosing myself with sugar seems to be increasingly similar to what I've experienced in my relationships, except that I cannot avoid my depression anymore when the source of "sugar" is shut off.

I enjoyed the short-lived bursts of serotonin being with my loved one peacefully, receiving the mental care and learning how to care them back for the first time I would have in my life – they made me satisfied. Love made me motivated to step forward to do things I wouldn't have done, and taught me the capacity to feel – I crave for the feelings of love, and notion that I could reinforce my motivation to work harder and stay committed to my relationship. But as my relationship further progressed, the illusion of "everything is going better" simply broke down. There were deeper feelings of depression within me, often because

1) I had to sacrifice something on my own to try offer more care to her as required – I couldn't take care myself as much;

2) I couldn't fully understand her feelings even at my full efforts, and she couldn't replicate mine;

3) too much simple sugar gives me an intolerable feeling (甜膩), and eventually it made me just become numb (alike diabetes). Part of my self-identity also knows that persistent simple, shallow feelings of sweetness cannot really compensate the hollow, bitter feelings of depression I felt – despite how much I crave for them, eventually I would have to realize there has to be a point to exit.

Love transformed my personality, but both the feelings of bitter and sweet simply made me numb.

I really want to continue having the feeling of sweetness, but realized that the sugars I received lately are simply too simple and not sustainable. I either have to

1) make my efforts to increase the complexity of sugar to make my positive feelings durable,

2) simply go on a detox diet to keep myself away from simple sugar, or

3) explore/ re-initiate new initiatives of fetching alternative sources of sugar, e.g. the fulfillment I get from typing reflections (@sunmustsettorise), the positive feelings I obtain from talking to people and exchanging ideas when I am more mentally okay, or engaging in activities (both alone and in teams) that could refresh myself.

If keeping on this "mental diet" full of sugar would make me further collapse, isn't it my responsibility to shift away from the high sugar diet and be just a bit more mental health-conscious? At least the sugar can't just be in the bottom of my Maslow pyramid – intaking so isn't my necessity and it isn't the only nutrient I need to keep myself healthily growing.

Never mind, it's just that while I am still sugar-dependent now, I realize I need to understand this.

