

Some Like It Sweet

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Have a sugar ‘addiction’? Do ice cream or chocolate cravings rule your evenings? Wonder why you’re weird and can take or leave sweets? Let’s talk sugar.

Sugars are consumed by bacteria, invertebrates and almost all types of animals. The exceptions are felines and purely carnivorous animals which have lost their ability to taste sweet, poor things. Hummingbirds have no distinct sweet taste receptors, which is odd, given that we stock hummingbird feeders with sugar water. Their savory receptors have evolved to taste sweet.

Human taste buds perceive five different tastes – Sweet, salt, bitter, sour and savory. Sweetness identifies energy-rich foods and is pleasurable. Savory, also known as umami, is a flavor that makes meat taste like meat. Bitterness warns us of potential poisons. Mildly sour food may have the pleasant tang of vinegar, but extra sourness signals potentially spoiled food.

Each taste bud type is independent, except for salt perception, which overlaps with the others. Under normal circumstances, mildly salty and savory foods enhance sweet taste but heavy salt and savory flavors suppress it. Our brains rely on more than taste buds to interpret what we eat. We perceive a food as a combination of taste, smell, food texture and expectation

Humans innately like sweet foods, as evidenced by the fact that every cuisine in the world includes dessert-like foods. Not all of us sense sweet and desire it equally, however, fitting one of four patterns: Those who perceive and prefer sweet at low, high, moderate or any of these levels. Even identical twins don’t necessarily have the same sweet preference. Only about 30% is determined by genes and the other 70% is a mystery.

Some scientists suggest that more sweet consumption begets more desire for it, while other data refutes that cause and effect. An equal number of studies ‘prove’ and ‘disprove’ that consuming sweets now leads to eating more sweet foods later. We actually know the opposite is true, however, in that a low sugar diet

reduces subsequent sugar intake, perhaps because the intensity of sweet perception increases. If it tastes sweeter, we eat less of it. That’s the theory.

Those studies looked at sugar consumption over time. When it comes to sugar consumption while gulping a big box of candy, different control mechanisms dominate. In mice, a sugar binge profoundly alters brain regions involved in pleasure reinforcement. These regions, including the amygdala, nucleus accumbens and ventral tegmental area, are responsible for emotional anticipation of reward and motivation. In humans the amygdala influences ‘reward learning’ and goal-directed emotional behavior. For example, it factors significantly into drug addiction, prodding an addict to consume ever-more cocaine or amphetamine rather than being satisfied after one dose. Similarly, these brain regions respond positively to highly palatable food, causing us to continue eating it long past fullness. Our genetic make-up determines how dominated we are by our amygdala – Some of us are drug or sugar addicts and can’t stop at one or ten or twenty and others can make a box of candy last for months.

Many other factors influence taste for sweet:

- Taste perception is affected by other food consumed at the same time.
- Physiology plays a role: We desire sweet foods more or less depending on our hydration status, levels of metabolic, sex and appetite hormones and degree of inflammation.
- Psychological factors play a role. We may desire comfort food or want to ‘drug’ anger or frustration. The situation in which food is eaten often dictates how much we eat. Alone we may binge or forget to eat. At a banquet or buffet we’ll eat more because it’s free or we want to get our money’s worth and every one of those desserts looks good.
- Repeated exposure to the same food may deaden desire or raise expectations for more.
- Sleep deprivation increases sweet consumption, even if it’s calorie-free. Sleep-deprived non-obese people devour much more sugar and other carbohydrates

than when they sleep well, regardless of their underlying sweet preference pattern.

- Many people crave sugar after exercise. Any exercise that burns significant calories pushes the body to demand calorie-dense foods afterwards. This is more dramatic in someone restricting calories to lose weight. The body knows when it needs calories. It's up to the individual to decide to satisfy it immediately with sugary, calorie-dense food or delay gratification with a more slowly absorbed healthy, balanced snack.

Understanding sweet propensity matters because too much sugar contributes to obesity and poor long-term health. Fructose, in particular, messes with metabolism. Fructose is 50% of table sugar and 55% of fruit sugar and high-fructose corn syrup. It is metabolized differently than other sugars. Unregulated processing in the liver leads to high triglyceride (fat) levels, elevated blood pressure, pro-inflammatory fat deposition around abdominal organs, and resistance to insulin action, spawning apple-shaped diabetics who die early.

I recently attended a Pepsico-sponsored symposium which of course emphasized a lack of proof for sugar consumption increasing sugar consumption, but omitted mention of 2-liter soda bottles, binge eating and the amygdala's insidious control over us. Since you and I know about these things, we need to be mindful of our own sweet propensity and how much sugar we eat. We need to ensure that we eat balanced diets and have our smidgeon of sugar too.¶