

[Answers] How sugar affects the brain by Nicole Avena

1. Sugar is a term used to describe a class of molecules of carbohydrates.

2. List three forms of sugar that are mentioned in the speech.

(1) _____

(2) _____

(3) _____

Glucose, fructose, sucrose, maltose, lactose, dextrose, starch, high-fructose corn syrup, fruit juice, raw sugar, and honey.

3. The following paragraph describes how sugar affects the brain and what happens when sugar hits our tongue. Fill in the blanks.

Sugar activates the sweet-taste receptors, part of the taste buds on the

(1) tongue. These receptors send a signal up to the (2) brain stem,

and from there, it forks off into many areas of the forebrain, one of which is the cerebral cortex.

Different sections of the cerebral cortex process different tastes: (3) bitter, salty,

(4) umami, and (5) sugar. From there, the signal activates the brain's

(6) reward system, which helps answer a single, subconscious question: should I

(7) do that again (3 words)? Your stomach has

(8) sugar receptors (2 words), too. They are not taste buds, but they send

(9) signals to your brain that you are (10) full or that

your body should produce more (11) insulin to deal with the extra sugar you're eating.

4. Which statement is **not true** about dopamine?

a. There are many dopamine receptors in the forebrain.

b. Dopamine is the major currency of our reward system.

c. Broccoli causes dopamine to be released, but not as violently as drugs.

d. Alcohol, nicotine, and heroin send dopamine into overdrive.

5. If you eat the same balanced meal many days in a row, your dopamine levels will spike less and less, and will eventually level out. Why?

The brain evolved to pay special attention to new or different tastes. (Why? There are two reasons: first, to detect food that's gone bad. And second, because the more variety we have in our diet, the more likely we are to get all the nutrients we need.)

6. Suppose, instead of a balanced meal, you eat sugar-rich food many days in a row. What will happen to your dopamine levels?

Your dopamine levels will not level out.

7. Which statement is **true** about sugar?

- a. Some types of sugar don't kickstart a domino effect in our brain that sparks a rewarding feeling.
- b. Even eating a wedge of cake once in a while be harmful to your health.
- c. Eating sugar-rich food will not cause any problems if you eat it with vegetables.

d. Sugar behaves a little bit like a drug, and that is why some people get hooked on sugary foods.