

# Eating sweets forms memories that may control eating habits, study finds

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Eating sweet foods causes the brain to form a memory of a meal, according to researchers at Georgia State University, Georgia Regents University and Charlie Norwood VA Medical Center.

The findings, published online in the journal *Hippocampus*, show that neurons in the dorsal hippocampus, the part of the brain that is critical for [episodic memory](#), are activated by consuming sweets. Episodic memory is the memory of autobiographical events experienced at a particular time and place.

In the study, a meal consisting of a sweetened solution, either sucrose or saccharin, significantly increased the expression of the [synaptic plasticity](#) marker called activity-regulated cytoskeleton-associated protein (Arc) in dorsal hippocampal neurons in rats. Synaptic plasticity is a process that is necessary for making memories.

"We think that episodic memory can be used to control eating behavior," said Marise Parent, professor in the Neuroscience Institute at Georgia State. "We make decisions like 'I probably won't eat now. I had a big breakfast.' We make decisions based on our memory of what and when we ate."

That possibility is supported by the [researchers' previous work](#), which showed that temporarily inactivating dorsal hippocampal neurons following a sucrose meal—the period during which the memory of a meal forms—accelerates the onset of the next meal and causes rats to eat more.

Forming memories of meals is important to a healthy diet. A London-based study shows that disrupting the encoding of the memory of a meal in humans, such as by watching television, increases the amount of food they consume during the next meal. Researchers have found that people with amnesia will eat again if presented with food, even if they've already eaten, because they have no memory of the meal.

To understand energy regulation and the causes of obesity, scientists must consider how the brain controls meal onset and frequency, Parent

said.

Studies have found that [increased snacking is correlated positively with obesity](#), and obese individuals snack more frequently than people who aren't obese. Research also shows that over the past three decades, [children and adults are eating more snacks](#) per day and deriving more of their daily calories from snacks, mostly in the form of desserts and sweetened beverages.

In the future, the research team would like to determine if nutritionally balanced liquid or solid diets that typically contain protein, fat and carbohydrates have a similar effect on Arc expression in dorsal hippocampal neurons and whether increases in Arc expression are necessary for the [memory](#) of sweet foods.

**More information:** *Hippocampus*, [onlinelibrary.wiley.com/doi/10.../hipo.22532/abstract](https://onlinelibrary.wiley.com/doi/10.1002/hipo.22532/abstract)

Provided by Georgia State University

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