

# Brain's response to seeing food may be linked to weight loss maintenance

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A difference in brain activity patterns may explain why some people are able to maintain a significant weight loss while others regain the weight, according to a new study by researchers with The Miriam Hospital.

The investigators report that when individuals who have kept the weight off for several years were shown pictures of food, they were more likely to engage the areas of the [brain](#) associated with behavioral control and visual attention, compared to obese and normal weight participants.

Findings from this brain imaging study, published by the [American Journal of Clinical Nutrition](#), suggest that successful weight loss maintainers may learn to respond differently to food cues.

"Our findings shed some light on the biological factors that may contribute to weight loss maintenance. They also provide an intriguing complement to previous behavioral studies that suggest people who have maintained a long-term weight loss monitor their [food intake](#) closely and exhibit restraint in their [food choices](#)," said lead author Jeanne McCaffery, PhD, of The Miriam Hospital's Weight Control and Diabetes Research Center.

Long-term weight loss maintenance continues to be a major problem in obesity treatment. Participants in behavioral weight loss programs lose an average of 8 to 10 percent of their weight during the first six months of treatment and will maintain approximately two-thirds of their weight loss after one year. However, despite intensive efforts, weight regain

appears to continue for the next several years, with most patients returning to their baseline weight after five years.

Researchers used functional magnetic resource imaging (fMRI), a non-invasive technique that localizes regions of the brain activated during cognition and experience, to study the brain activity of three groups: 18 individuals of normal weight, 16 obese individuals (defined as a [body mass index](#) of at least 30), and 17 participants who have lost at least 30 lbs and have successfully maintained that weight loss for a minimum of three years.

After a four-hour fast, to ensure participants would be hungry, they were shown pictures of food items, including low-calorie foods (such as whole grain cereals, salads, fresh vegetables and fruit); high-calorie foods (including cheeseburgers, hot dogs, French fries, ice cream, cake and cookies), and nonfood objects with similar visual complexity, texture and color (e.g., rocks, shrubs, bricks, trees and flowers). The MRI scan documented brain responses to each image.

Those in the successful [weight loss](#) maintenance group responded differently to these pictures compared to the other groups. Specifically, researchers observed strong signals in the left superior frontal region and right middle temporal region of the brain - a pattern consistent with greater inhibitory control in response to food images and greater visual attention to food cues.

"It is possible that these brain responses may lead to preventive or corrective behaviors - particularly greater regulation of eating - that promote long-term weight control," said McCaffery, who is also an assistant professor of psychiatry and human behavior (research) at The Warren Alpert Medical School of Brown University. "However, future research is needed to determine whether these responses are inherent within an individual or if they can be changed."

Source: Lifespan ([news](#) : [web](#))

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