

# Hard work improves the taste of food, study shows

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It's commonly accepted that we appreciate something more if we have to work hard to get it, and a Johns Hopkins University study bears that out, at least when it comes to food.

The study seems to suggest that hard work can even enhance our appreciation for fare we might not favor, such as the low-fat, low calorie variety. At least in theory, this means that if we had to navigate an obstacle course to get to a plate of baby carrots, we might come to prefer those crunchy crudités over the sweet, gooey Snickers bars or Peanut M&Ms more easily accessible via the office vending machine.

"Basically, what we have shown is that if you have to expend more effort to get a certain [food](#), not only will you value that food more, but it might even taste better to you," explained Alexander Johnson, an associate research scientist in the Department of Psychological and Brain Sciences at the Krieger School of Arts and Sciences at Johns Hopkins. "At present, we don't know why effort seems to boost the taste of food, but we know that it does, and this effect lasts for at least 24 hours after the act of working hard to get the food."

The study, titled "Greater effort boosts the affective taste properties of food," appears in this week's issue of the *Proceedings of the Royal Society B*.

The study results are significant not only because they hold out hope that people who struggle to maintain a healthy weight could be conditioned to

consume lower calorie foods, but because they also might provide insight into methods of altering other less-than-optimal behavior, according to Johnson, who led the study.

Johnson teamed up on the project with Michela Gallagher, the Krieger-Eisenhower Professor of Psychological and Brain Sciences and Neuroscience and vice provost for academic affairs at Johns Hopkins. Using ordinary laboratory mice, the team conducted two experiments.

In the first, mice were trained to respond to two levers. If the mice pressed one lever once, they were rewarded with a sugary treat. Another lever had to be pressed 15 times to deliver a similar snack. Later, when given free access to both tidbits, the rodents clearly preferred "the food that they worked harder for," Johnson said.

In the second experiment, the team wanted to ascertain whether the animals' preference for the harder-to-obtain food would hold if those morsels were low-calorie. So half the mice received lower calorie goodies from a high-effort lever, and half got them from a low-effort lever. When both groups of mice were given free access to the low-calorie food later, those who had used the high-effort lever ate more of it and even seemed to enjoy it more than did the other group.

"We then analyzed the way in which the mice consumed the food," Johnson explained. "Why did we do this? Because food intake can be driven by a variety of factors, including how it tastes, how hungry the mice were beforehand, and how 'sated' or full the food made them feel."

Johnson and Gallagher used licking behavior as a measure of the rodents' enjoyment of their treats, and found that the mice that had to work harder for their low-cal rewards did, in fact, savor them more.

"Our basic conclusion is that under these conditions, having to work

harder to get a certain food changes how much that food is valued, and it does that by changing how good that food tastes," Johnson said. "This suggests that, down the road, obese individuals might be able to alter their eating habits so as to prefer healthier, low calorie food by manipulating the amount of work required to obtain the food. Of course, our study didn't delve into that aspect. But the implications certainly are there."

Provided by Johns Hopkins University

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