

Brain stimulation to reduce food cravings?

The data so far...

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Available research suggests that noninvasive stimulation of a specific brain area can reduce food cravings—particularly for high-calorie, "appetitive" foods, according to a review in the *Psychosomatic Medicine: Journal of Biobehavioral Medicine*, the official journal of the American Psychosomatic Society.

However, there's not yet consistent evidence to show that brain stimulation can reduce actual [food](#) consumption, according to the research review by Peter A. Hall, PhD, of University of Waterloo, Ont., Canada, and colleagues.

Brain Stimulation May Curb Your Cravings—Especially for Carbs

The researchers analyzed previous studies evaluating the effects of noninvasive brain stimulation on food cravings and food consumption. Stimulation studies have targeted a brain area called the dorsolateral prefrontal cortex (DLPFC), which appears to play a role in the "conscious regulation of food craving and consumption of calorie-dense foods."

The review identified eleven studies evaluating the effects of DLPFC stimulation on food cravings and/or consumption. The studies included human volunteers in laboratory settings—most often women who reported "strong and frequent" cravings for high-calorie snack foods. All studies used an appropriate sham (inactive) stimulation procedure.

Of eight studies providing data on food cravings, all but one showed a significant effect of brain stimulation. Meta-analysis of pooled data from these studies suggested a "moderate-sized effect" of DLPFC stimulation on food cravings—roughly half a point on a four-point self-rated scale.

Just one of the two types of stimulation studied had a significant effect on food cravings—a

technique called repetitive transcranial magnetic stimulation (rTMS). The other technique evaluated, transcranial direct current stimulation, did not significantly affect cravings.

In contrast, the results of nine studies providing data on actual food consumption were inconsistent. The pooled data analysis suggested no significant effect of brain stimulation.

Another two studies evaluated the effects of treatment using repeated sessions of DLPFC stimulation. One study found a significant reduction in total food intake after daily stimulation, while the other did not. However, there was some evidence that stimulation specifically reduced consumption of carbohydrates—for example, cookies, cakes, and soda.

That's important, because calorie-dense snack foods are often implicated in the development of obesity. One reason it's so difficult to lose weight by dieting is that the person has to overcome the "natural preferences" for these types of appetitive foods. It's not entirely clear how DLPFC works to reduce food cravings, but evidence suggests possible effects on the "reward center" of the brain and/or enhanced cognitive control over cravings.

The available data support the conclusion that DLPFC stimulation reduces [food cravings](#), Dr. Hall and coauthors believe. "These effects seem to be strongest for rTMS neuromodulation methods and are moderate in magnitude," they write.

While so far there's "no reliable effect" of [brain stimulation](#) in reducing overall food consumption, studies do suggest a possible effect on intake of carbohydrates. Dr. Hall and colleagues make suggestions for future research, clarifying the potential benefits of repeated sessions of rTMS and focusing on actual [food consumption](#)—especially calorie-dense [snack foods](#).

More information: Cassandra J. Lowe et al.
Effects of Noninvasive Brain Stimulation on Food
Cravings and Consumption, *Psychosomatic
Medicine* (2016). [DOI:](#)
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