

Heightened sensitivity to cheap, high-calorie food is linked with obesity

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Obesity is increasing worldwide in adults and children and is currently viewed by many as one of the most serious threats to public health. It is likely that solutions to the obesity pandemic will require changes in public policy and that scientific insight into obesity will be invaluable for guiding those changes. Now, a new review of human brain imaging studies published by Cell Press in the journal *Trends in Endocrinology and Metabolism* suggests that a major reason for the dramatic increase in obesity may be a heightened sensitivity to heavily advertised and easily accessible high-calorie foods.

"[Functional neuroimaging](#) of the human brain allows non-invasive mapping of brain activity in health and disease," explains review author Dr. Alain Dagher from the Montreal Neurological Institute, McGill University. "It is now commonly used to try to understand the neural control of eating in humans, and patterns of [brain activity](#) thought to underlie obesity have emerged. In particular, there has been great interest in looking at the brain for the source of vulnerability to overeating in a world of cheap, abundant, high-calorie food. As a result of this research, differences between lean and obese individuals are starting to emerge."

In the paper, Dr. Dagher discusses some of the more consistent findings of this research. Neuroimaging studies have led to the identification of a brain network for [appetite control](#), uncovered learning and motivational signals that are linked with appetite, and helped to unravel how reward networks are linked with food intake. Studies have shown that brain

mechanisms of obesity are very complex and are not just related to abnormalities in food-associated reward signaling. Research suggests that overeating has its origins where a person makes a food choice and that anticipatory signals play a critical role in the vulnerability to obesity. Importantly, obese individuals exhibit greater [brain activation](#) in response to sweet or fatty food cues, suggesting a key role for signals associated with motivation to eat.

"The emerging imaging literature supports the view that although there is not a single pathway leading to obesity, it is a neurobehavioral problem: a disease that results from a vulnerable brain in an unhealthy environment," explains Dr. Dagher. "The demonstration that humans are sensitive to food cues, such as advertising, especially when these food cues are associated through past experience with high-calorie foods, cannot be ignored. As for tobacco in the 1990s, the neuroscience of appetite will be called upon to inform and justify the public policy decisions that will be needed to address this most significant public health problem."

More information: Functional brain imaging of appetite, [doi:10.1016/j.tem.2012.02.009](https://doi.org/10.1016/j.tem.2012.02.009)

Provided by Cell Press

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