Successful weight loss maintainers have different behavioral and physiological responses to food

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Successful weight loss maintainers have different behavioural and physiological responses to food than people with obesity and their lean counterparts, according to new research by the University of Birmingham and the University of Amsterdam being presented at this year's European Congress on Obesity (ECO) in Vienna, Austria (23-26 May).

The findings indicate that a reduced physiological response to highly palatable foods such as pizza, and reduced sensitivity towards "winning" foods, may help explain why some individuals are able to successfully lose weight in the long-term.

Obesity costs the global economy around US$2 trillion a year, and risk factors linked to poor diet contribute to more disease than unsafe sex, alcohol, drugs, and tobacco use combined. There has been much research into how our food environment and neurobiology can lead to overeating. For example, highly palatable foods such as pizza and chocolate trigger signals in the brain that give a feeling of pleasure and reward. These cravings contribute to overeating. But little is known if these responses to food cues support weight-loss maintenance.

In this study, Leonie Balter from the University of Birmingham's School of Psychology in the UK and colleagues looked at saliva production and heart rate following exposure to pizza in different weight groups

(average age 29.5 years). The team, from the Suzanne Higgs' Eating Behaviour Research Group, compared the responses of three groups-successful weight-loss maintainers who previously had obesity (20 participants), individuals with current obesity (25), and never-overweight lean individuals (20)

They found that individuals with obesity had a heightened salivation and heart rate response following presentation of the pizza, whilst the salivation and heart rate of successful weight-loss maintainers decreased, and lean individuals were unresponsive.

Participants also completed cognitive tasks to objectively measure their motivation to win and avoid losing food and money in a computerised task. Participants had to figure out the meaning of a symbol by trial-and-error. On each trial they choose one of two figures. The figure either meant that they won food, lost food, won money, or lost money. After a while participants learned what a specific symbol meant, and their ability to win or avoid different rewards was measured.

Compared to the lean and obese groups, the ability of the weight loss maintainers to learn the meaning of the symbol was less affected by food "wins" and more affected by food "losses". These data may suggest that explicit food rewards have less value for weight loss maintainers.

The findings add to knowledge about the factors that might predict successful weight loss maintenance. The authors conclude: "Our findings reveal a marked difference in physiological reactivity to food depending on weight-loss history. The results suggest that explicit food rewards have less value for weight loss maintainers. Further longitudinal research is needed to determine whether reduced physiological response to palatable (high calorie) food and sensitivity to food rewards may be predictive of individuals that can successfully restrict food intake."

This is an observational study, so no firm conclusions can be drawn about cause and effect and the authors point to several limitations, including that the current study included a small sample size and results must therefore be replicated in a bigger group of people.

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