A role for sweet taste: calorie predictive relations in energy regulation by rats.

Swithers SE, Davidson TL.

Department of Psychological Sciences, Ingestive Behavior Research Center, Purdue University, West Lafayette, IN 47907, USA. swithers@purdue.edu

Abstract

Animals may use sweet taste to predict the caloric contents of food. Eating sweet noncaloric substances may degrade this predictive relationship, leading to positive energy balance through increased food intake and/or diminished energy expenditure. These experiments were designed to test the hypothesis that experiences that reduce the validity of sweet taste as a predictor of the caloric or nutritive consequences of eating may contribute to deficits in the regulation of energy by reducing the ability of sweet-tasting foods that contain calories to evoke physiological responses that underlie tight regulation. Adult male Sprague-Dawley rats were given differential experience with a sweet taste that either predicted increased caloric content (glucose) or did not predict increased calories (saccharin). We found that reducing the correlation between sweet taste and the caloric content of foods using artificial sweeteners in rats resulted in increased caloric intake, increased body weight, and increased adiposity, as well as diminished caloric compensation and blunted thermic responses to sweet-tasting diets. These results suggest that consumption of products containing artificial sweeteners may lead to increased body weight and obesity by interfering with fundamental homeostatic, physiological processes.

Copyright (c) 2008 APA, all rights reserved.

PMID: 18298259 [PubMed - indexed for MEDLINE]