Medical Xpress

Artificial sweeteners linked to weight gain

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Want to lose weight? It might help to pour that diet soda down the drain. Researchers have laboratory evidence that the widespread use of no-calorie sweeteners may actually make it harder for people to control their intake and body weight. The findings appear in the February issue of *Behavioral Neuroscience*, which is published by the American Psychological Association (APA).

Psychologists at Purdue University's Ingestive Behavior Research Center reported that relative to rats that ate yogurt sweetened with glucose (a simple sugar with 15 calories/teaspoon, the same as table sugar), rats given yogurt sweetened with zero-calorie saccharin later consumed more calories, gained more weight, put on more body fat, and didn't make up for it by cutting back later, all at levels of statistical significance.

Authors Susan Swithers, PhD, and Terry Davidson, PhD, surmised that by breaking the connection between a sweet sensation and high-calorie food, the use of saccharin changes the body's ability to regulate intake. That change depends on experience. Problems with self-regulation might explain in part why obesity has risen in parallel with the use of artificial sweeteners. It also might explain why, says Swithers, scientific consensus on human use of artificial sweeteners is inconclusive, with various studies finding evidence of weight loss, weight gain or little effect. Because people may have different experiences with artificial and natural sweeteners, human studies that don't take into account prior consumption may produce a variety of outcomes.

Three different experiments explored whether saccharin changed lab

animals' ability to regulate their intake, using different assessments –the most obvious being caloric intake, weight gain, and compensating by cutting back.

The experimenters also measured changes in core body temperature, a physiological assessment. Normally when we prepare to eat, the metabolic engine revs up. However, rats that had been trained to respond using saccharin (which broke the link between sweetness and calories), relative to rats trained on glucose, showed a smaller rise in core body temperate after eating a novel, sweet-tasting, high-calorie meal. The authors think this blunted response both led to overeating and made it harder to burn off sweet-tasting calories.

"The data clearly indicate that consuming a food sweetened with no-calorie saccharin can lead to greater body-weight gain and adiposity than would consuming the same food sweetened with a higher-calorie sugar," the authors wrote.

The authors acknowledge that this outcome may seem counterintuitive and might not come as welcome news to human clinical researchers and health-care practitioners, who have long recommended low- or no-calorie sweeteners. What's more, the data come from rats, not humans. However, they noted that their findings match emerging evidence that people who drink more diet drinks are at higher risk for obesity and metabolic syndrome, a collection of medical problems such as abdominal fat, high blood pressure and insulin resistance that put people at risk for heart disease and diabetes.

Why would a sugar substitute backfire" Swithers and Davidson wrote that sweet foods provide a "salient orosensory stimulus" that strongly predicts someone is about to take in a lot of calories. Ingestive and digestive reflexes gear up for that intake but when false sweetness isn't followed by lots of calories, the system gets confused. Thus, people may

eat more or expend less energy than they otherwise would.

The good news, Swithers says, is that people can still count calories to regulate intake and body weight. However, she sympathizes with the dieter's lament that counting calories requires more conscious effort than consuming low-calorie foods.

Swithers adds that based on the lab's hypothesis, other artificial sweeteners such as aspartame, sucralose and acesulfame K, which also taste sweet but do not predict the delivery of calories, could have similar effects. Finally, although the results are consistent with the idea that humans would show similar effects, human study is required for further demonstration.

Source: American Psychological Association