

# Two studies point to the illusion of the artificial sweeteners

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In the constant battle to lose inches or at least stay the same, we reach for the diet soda. Two studies presented June 25 and 27 at the American Diabetes Association's Scientific Sessions in San Diego suggest this might be self-defeating behavior.

Epidemiologists from the School of Medicine at The University of Texas Health Science Center San Antonio reported data showing that diet soft drink consumption is associated with increased [waist circumference](#) in humans, and a second study that found aspartame raised fasting glucose (blood sugar) in diabetes-prone mice.

"Data from this and other prospective studies suggest that the promotion of diet sodas and [artificial sweeteners](#) as healthy alternatives may be ill-advised," said Helen P. Hazuda, Ph.D., professor and chief of the Division of Clinical Epidemiology in the School of Medicine. "They may be free of calories but not of consequences."

## Human study: The San Antonio Longitudinal Study of Aging

To examine the relationship between diet soft drink consumption and long-term change in waist circumference, the Health Science Center team assessed data from 474 participants in the San Antonio [Longitudinal Study](#) of Aging, or SALSA. This is a large, population-based study of the disablement process in elderly Mexican Americans

and European Americans. Dr. Hazuda, senior author of the presentation, is SALSA's principal investigator and has led the study for two decades.

Measures of height, weight, waist circumference and [diet soda](#) intake were recorded at SALSA enrollment and at three follow-up exams that took place over the next decade. The average follow-up time was 9.5 years. The researchers compared long-term change in waist circumference for diet soda users versus non-users in all follow-up periods. The results were adjusted for waist circumference, diabetes status, leisure-time physical activity level, neighborhood of residence, age and smoking status at the beginning of each interval, as well as sex, ethnicity and years of education.

Diet soft drink users, as a group, experienced 70 percent greater increases in waist circumference compared with non-users. Frequent users, who said they consumed two or more diet sodas a day, experienced waist circumference increases that were 500 percent greater than those of non-users.

Abdominal fat is a major risk factor for diabetes, cardiovascular disease, cancer and other chronic conditions. "These results suggest that, amidst the national drive to reduce consumption of sugar-sweetened drinks, policies that would promote the consumption of diet soft drinks may have unintended deleterious effects," the authors wrote.

Co-authors include Sharon P. Fowler, M.P.H., faculty associate, and Ken Williams, M.S., P.Stat., adjunct assistant professor and biostatistician, in the Division of [Clinical Epidemiology](#).

## **Mouse study: Aspartame consumption in diabetes-prone mice**

In the related project, Ganesh Halade, Ph.D., Gabriel Fernandes, Ph.D., the senior author and professor of rheumatology and clinical immunology, and Fowler studied the relationship between oral exposure to aspartame and fasting glucose and insulin levels in 40 diabetes-prone mice. Aspartame is an artificial sweetener widely used in diet sodas and other products.

One group of the mice ate chow to which both aspartame and corn oil were added; the other group ate chow with the corn oil added but not the aspartame. After three months on this high-fat diet, the mice in the aspartame group showed elevated fasting glucose levels but equal or diminished insulin levels, consistent with early declines in pancreatic beta-cell function. The difference in insulin levels between the groups was not statistically significant. Beta cells make insulin, the hormone that lowers blood sugar after a meal. Imbalance ultimately leads to diabetes.

"These results suggest that heavy aspartame exposure might potentially directly contribute to increased blood glucose levels, and thus contribute to the associations observed between [diet](#) soda consumption and the risk of diabetes in humans," Dr. Fernandes said.

These two translational research studies resulted from collaboration between Fowler and Drs. Hazuda and Fernandes and their research teams. The Institute for the Integration of Medicine and Science (IIMS) funded the work. IIMS is the Health Science Center entity that oversees the university's Clinical and Translational Science Award (CTSA), a National Institutes of Health-funded program to encourage the rapid translation of scientific discoveries from the laboratory through the testing process and to practical application for the health of communities.

Provided by University of Texas Health Science Center at San Antonio

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