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Scientists find new tool to easily measure long-term sugar consumption (Video)

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Researchers finally were able to trap the carbon from dietary sugar so it could be used as a measure of long-term sugar intake by looking at the protein in a hair or blood sample. Scientists at the University of Alaska Fairbanks just found a new tool to measure sugar consumption. Eating excess sugar lowers the immune system. See, the [Ask Dr. Sears@](#) article, "[Harmful Effects of Excess Sugar.](#)"

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The researchers identified a new tool that can dramatically improve the notoriously inaccurate surveys of what and how much an individual eats and drinks. Their research is published in the June 2013 issue of the Journal of Nutrition, according to a June 18, 2013 IAB news release, "[Scientists find new tool to measure sugar consumption.](#)"

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Conventional wisdom says that consumption of sugar-sweetened beverages such as soda and fruit juice is a significant contributor to obesity and chronic disease risk, but the science surrounding this issue is inconclusive. Part of the problem is that in a typical diet survey few people accurately and consistently recall what they consumed. The problem becomes exaggerated when people underreport foods they know are less healthy for them, like sugars.

Researchers were looking for a measure of long-term sugar intake from a hair or blood sample

“We were looking for an objective biomarker that could accurately measure long-term sugar intake from a single blood or hair sample” said Diane O’Brien, in the news release, ["Scientists find new tool to measure sugar consumption."](#) O’Brien is the project leader and biologist with the UAF Center for Alaska Native Health Research at the Institute of Arctic Biology.

The biomarker O’Brien and her CANHR research group pilot-tested was the ratio of two different carbon atoms (heavy carbon 13 and light carbon 12) which are incorporated into plants during photosynthesis. The ratio, called an isotopic signature, is distinct in corn and sugar cane, which are the sources of nearly all of the sugars found in sugar-sweetened beverages.

“We used the isotopic signature of alanine an amino acid and building block of protein that essentially traps the carbon from dietary sugar so that it can be measured in the protein component of hair or blood,” O’Brien explained in the news release.



Scientists find new tool to measure long-term sugar consumption from a hair or blood sample.
Photo credit: Chef Richard Park rolls two croissant-doughnut hybrids, known as 'cronuts,' in maple sugar at Dominique Ansel Bakery on June 10, 2013 in New York City. (Photo by Andrew Burton/Getty Images).

Even after foods and beverages are consumed, metabolized, transported in blood and stored in body tissues, these isotopic signatures remain largely intact

The more sugar-sweetened beverages an individual consumes, the greater alanine’s carbon isotope ratio will be. Importantly, O’Brien’s group found that alanine was uncorrelated with other foods that can contribute to elevated carbon ratios.

Although the use of isotope signatures to study food webs and diet is not new, previous efforts to accurately measure sweetener intake have not been particularly successful. The use of alanine and the technique employed by O’Brien’s group makes their findings particularly exciting.

“Even for validated and well-accepted biomarkers of diet, associations with self-reported intake are generally very weak. Our biomarker was able to explain almost half of the variation in self-reported sugar-sweetened beverage intake, which in this field is a very high level of explanatory power,” said O’Brien in the news release.

The scientists’ findings are also being used in other health and diet-related research

“Diane’s research program has provided CANHR with incredibly valuable objectively measured biomarkers of food intake,” said CANHR Director Bert Boyer, according to the news release. “These biomarkers are currently being used to help us understand the role polyunsaturated fatty acids play in disease prevention, including the modification of genetic risk.”

The tool is not without its drawbacks, caution the authors. “The gas chromatography-combustion-isotope ratio mass spectrometry process we used isn’t inexpensive and or widely available,” O’Brien said in the news release. “We expect that our findings will be most useful as a calibration tool, either for self-reported dietary data or more high-throughput biomarkers of sweetener intake.”



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Research is done from a genetic, dietary, and cultural-behavioral perspective

The Center for Alaska Native Health Research was established through a five-year grant awarded by the National Institutes of Health, National Center for Research Resources to the University of Alaska Fairbanks. The purpose of CANHR is to investigate weight, nutrition and health in Alaska Natives.

CANHR approaches this thematic focus from a genetic, dietary and cultural-behavioral perspective. The funding comes through a program for Centers of biomedical Research Excellence. This project is a partnership with the Yukon-Kuskokwim Health Corporation. The participants and data in this project are from the CANHR Neqem Nallunaikuta (The Foods' Market) study conducted in 2008-2009 in two coastal Yup'ik communities in Southwest Alaska.

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