Sweetness Perception in Habitual and Non-habitual Users of Low-calorie Sweeteners – a Pilot Study.

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Although previously considered to be metabolically inert, growing evidence suggest that low-calorie sweeteners (LCS) have potential detrimental effects on glucose control. A plausible mechanism by which LCS might do so is by altering sweetness perception because taste perception can affect glucose metabolism. The objective of this study was to test the hypothesis that habitual LCS consumption is associated with decreased sweetness sensitivity and decreased intake of added sugars. Habitual (n=8) and non-habitual (n=16) consumers (i.e. >5 or <1 diet soda or LCS equivalent product per week) completed a battery of tests. We assessed glucose detection thresholds using a 2-alternative forced-choice staircase procedure, sweet taste intensities of suprathreshold concentrations using the general labelled magnitude scale, sweet preferences using the Monell 2-series, forced choice tracking procedure, and cravings for sweet foods and sugar intake using validate questionnaires. Compared to non-habitual, habitual LCS consumers had a higher glucose detection threshold (33.9±7.1 vs 61.4±9.9 mM, $p<0.04$) and tended to consume more added sugars, particularly sucrose ($p=0.05$) in the past month. However, groups did not differ in their frequency of food cravings, sweetness intensity perception or most preferred glucose or sucralose concentrations. These preliminary data partially support our hypothesis of a reduced sweetness sensitivity in habitual LCS consumers, whom, on average, required an 80% increase in glucose concentration to detect a taste compared to non-habitual consumers. However, sweetness intensity perception at suprathreshold concentrations was not different between the groups. Far from displacing caloric sweeteners in the diet, habitual LCS consumption was associated with higher added sugar intake.

Funding acknowledgment: This research was funded in part by the American Diabetes Association grant 1-19-ICTS-092 (MYP) and by a fellowship from the USDA National Institute of Food and Agriculture National Needs Predoctoral training grant in Nutrition & the Gut Brain Axis :Implications for development and healthy aging 2019-38420-28973 (CS).

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