

Reduced dietary intake of simple sugars alters perceived sweet taste intensity but not perceived pleasantness¹

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Abstract

Background: Individuals who adhere to reduced-sodium diets come to prefer less salt over time, but it is unclear whether sweet taste perception is modulated by reduced sugar intake.

Objective: The objective was to determine how a substantial reduction in dietary intake of simple sugars affects sweetness intensity and pleasantness of sweet foods and beverages.

Design: Healthy men and women aged 21–54 y participated for 5 mo. After the baseline month, 2 subject groups were matched for demographic characteristics, body mass index, and intake of simple sugars. One group ($n = 16$; 13 of whom completed key experimental manipulations) was randomly assigned to receive a low-sugar diet during the subsequent 3 mo, with instructions to replace 40% of calories from simple sugars with fats, proteins, and complex carbohydrates. The other (control) group ($n = 17$; 16 of whom completed the study) did not change their sugar intake. During the final month, both groups chose any diet they wished. Each month subjects rated the sweetness intensity and pleasantness of vanilla puddings and raspberry beverages that varied in sucrose concentration.

Results: ANOVA showed no systematic differences between groups in rated sweetness during the baseline or first diet month. During the second diet month, the low-sugar group rated low-sucrose pudding samples as more intense than did the control group (significant group-by-concentration interaction, $P = 0.002$). During the third diet month, the low-sugar subjects rated both low and high concentrations in puddings as ~40% sweeter than did the control group (significant effect of group, $P = 0.01$). A weaker effect on rated sweetness was obtained for the beverages. Rated pleasantness was not affected for either of the stimuli.

Conclusions: This experiment provides empirical evidence that changes in consumption of simple sugars influence perceived sweet taste intensity. More work is needed to determine whether

sugar intake ultimately shifts preferences for sweet foods and beverages. This trial was registered at clinicaltrials.gov as [NCT02090478](https://clinicaltrials.gov/ct2/show/study/NCT02090478).