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Beverage Sweetness Adaptation in Adults in the USA and Mexico

To reduce sugar intake, multiple health organizations recommend that we reduce the amount of sweet foods and beverages in our diets.

This suggestion comes from the assumption that consuming sweet-tasting foods and beverages is linked to developing unhealthy eating patterns.^{1,2} However, there is not enough scientific evidence to support this assumption at this time.

More research is needed to determine if there is a link between health and³:



Sweet Taste



Sweetness Intake



Sweetness Adaptation

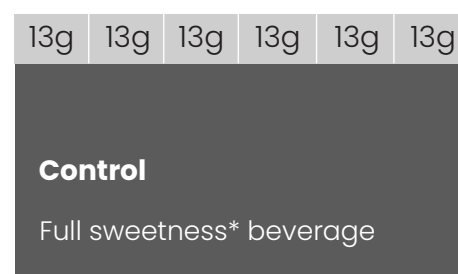
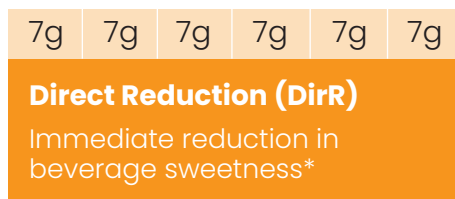
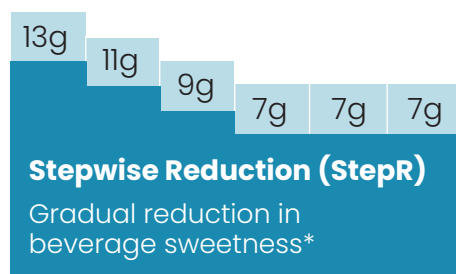
New Research on Beverage Sweetness Adaptation



- Research suggests that we may be able to adapt to and accept less sweet products.⁴⁻⁷
- To better understand sweetness adaptation and acceptability, scientists at PepsiCo conducted research to look at different ways to reduce sweetness and if these strategies could change sweetness preference and perceived sweetness intensity in consumers who regularly drink full-sugar sweetened (FSS) or low-calorie sweetened (LCS) carbonated beverages.⁸
- The research was completed in the United States of America (USA) and Mexico (MX), providing a look into regional and cultural differences on sweetness adaptation and acceptance of products with reduced sweetness.

Study Design

Participants consumed 1 of 4 orange-flavored FSS or LCS carbonated soft drinks (CSD) daily over 6 months. Before starting the study and for each month during the study, participants rated how much they liked the 4 different CSDs as well as the sweetness intensity of sugar-water mixtures with varying amounts of sucrose. FSS and LCS participants from the USA and MX were randomized to 1 of 3 sweetness arms over 6 months:



*Sweetness levels of beverages are expressed in °Brix (1 g sugar/100mL) or °Brix equivalents (1 g sugar equivalents/100mL)

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Results



Liking for reduced sweetness **decreased with time** for the Control group, but remained unchanged or slightly increased over time for the USA FSS-CSD cohort. No differences were seen in USA LCS-CSD and MX FSS-CSD and LCS-CSD cohorts.



Participants in both StepR and DirR groups, as well as in both cohorts and countries showed **greater willingness to purchase** reduced sweetness CSDs compared to the Control.



For both cohorts in both countries, **no differences were seen** in sweetness intensity perception of the low sucrose solutions between all three groups.



No clinically relevant changes were seen in dietary intake or body weight in both the StepR and DirR groups from the FSS-CSD and LCS-CSD cohorts.

Key Takeaways



Personalized approaches to diet are key when working with patients.



Individual **sweetness preferences** are based on a wide variety of factors, including diet, ethnicity and lifestyles.



Existing literature suggests there is **little to no association** between sweetness consumption and dietary intake.



There is a need for **future research** focused on introducing lower sweetness products to the market.



Recommendations should focus on an overall healthful dietary pattern with replacement of sugars.

References

1. World Health Organization Regional Office for the Eastern Mediterranean. Policy statement and recommended actions for lowering sugar intake and reducing prevalence of type 2 diabetes and obesity in the Eastern Mediterranean Region. Published 2016. Accessed March 25, 2025. https://applications.emro.who.int/dsaf/EMROPUB_2016_en_18687.pdf
2. Pan American Health Organization. Pan American Health Organization nutrient profile model. Published 2016. Accessed March 25, 2025. https://iris.paho.org/bitstream/handle/10665.2/18621/9789275118733_eng.pdf
3. Appleton KM, Tuorila H, Bertenshaw EJ, de Graaf C, Mela DJ. Sweet taste exposure and the subsequent acceptance and preference for sweet taste in the diet: systematic review of the published literature. *Am J Clin Nutr*. 2018;107(3):405-419. doi:10.1093/ajcn/nqx031
4. Khimsuksri S, Tangabuttra S, Tapananont T, Sangaroon S, Rattanathongkom A, Paphangkorakit J. Effect of stepwise sugar reduction on the satisfaction of sucrose-sweetened drink. *J Med Assoc Thai*. 2020;103(Suppl.1):32-35.
5. Biguzzi C, Lange C, Schlich P. Effect of sensory exposure on liking for fat- or sugar-reduced biscuits. *Appetite*. 2015;95:317-323. doi:10.1016/j.appet.2015.07.001
6. Wise PM, Nattress L, Flammer LJ, Beauchamp GK. Reduced dietary intake of simple sugars alters perceived sweet taste intensity but not perceived pleasantness. *Am J Clin Nutr*. 2016;103(1):50-60. doi:10.3945/ajcn.115.112300
7. Ebbeling CB, Feldman HA, Steltz SK, Quinn NL, Robinson LM, Ludwig DS. Effects of sugar-sweetened, artificially sweetened, and unsweetened beverages on cardiometabolic risk factors, body composition, and sweet taste preference: a randomized controlled trial. *J Am Heart Assoc*. 2020;9(15):e015668. doi:10.1161/JAHA.119.015668
8. Mah E, Kamil A, Blonquist TM, et al. Change in liking following reduction in sweetness level of carbonated beverages: a randomized controlled parallel trial. *Sci Rep*. 2024;14(1):26742. doi:10.1038/s41598-024-77529-w