



**YALE RUDD CENTER**  
FOR FOOD POLICY & OBESITY

## Study Synopses: Sugar-Sweetened Beverages (SSBs) and Adult Obesity

Citation	Funder(s)	Conclusions
Malik, V.S., Pan, A., Willett, W.C., Hu, F.B. (2013). Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis. <i>Am J Clin Nutr</i> , 98.4, 1084 - 1102.	NIH	A review and meta-analysis of a total of thirty-two prospective cohort studies and trials showed an overall positive association between consumption of SSBs and body weight in both children and adults.
Qi, Q., Chu, A.Y., Kang, J.H., et al. (2012) Sugar-sweetened beverages and genetic risk of obesity. <i>N Engl J Med</i> , 367, 1387 - 1396.	NIH; Merck Research Laboratories; American Heart Association; Harvard Glaucoma Center of Excellence; Amgen	Greater consumption of SSBs was associated with a greater susceptibility to genetic predisposition to elevated BMI and increased risk of obesity.
Malik, V.S., Hu, F.B. (2012). Sweeteners and risk of obesity and type 2 diabetes: The role of sugar-sweetened beverages. <i>Curr Diab Rep</i> , 12, 195 - 203.	n/a	Epidemiological evidence shows strong and consistent associations between SSB intake and risk of type 2 diabetes.
Tate, D.F., Turner-McGrievy, G., Lyons, E., Stevens, J., Erickson, K., Polzien, K., Diamond, M., Wang, X., Popkin, B. (2012). Replacing caloric beverages with water or diet beverages for weight loss in adults: main results of the <u>C</u> hose <u>H</u> ealthy <u>O</u> ptions <u>C</u> onsciously <u>E</u> veryday (CHOICE) randomized clinical trial. <i>Am J Clin Nutr</i> , 95, 555 - 563.	Nestlé Waters USA	Study participants who substituted water or diet beverages for caloric beverages lost an average of 2% to 2.5% of their starting weight.

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Mattes, R.D., Shikany, J.M., Kaiser, K.A., Allison, D.B. (2011). Nutritively sweetened beverage consumption and body weight: a systematic review and meta-analysis of randomized experiments. <i>Obes Rev</i> , 12, 346 - 365.	NIH; Dr. Mattes and Dr. Alison have received grants, honoraria, donations and consulting fees from numerous food, beverage, pharmaceutical companies, and other commercial and non-profit entities with interests in obesity.	The current evidence does not demonstrate conclusively that SSB consumption has uniquely contributed to obesity or that reducing SSB consumption will reduce BMI levels in general.
Mozaffarian, D., Hao, T., Rimm, E.B., Willett, W.C., Hu, F.B. (2011). Changes in diet and lifestyle and long-term weight gain in women and men. <i>N Engl J Med</i> , 364.25, 2392 - 2404.	NIH; Searle Scholars Program	Over a four year period, SSB consumption was associated with weight gain of one pound per year.
Woodward-Lopez, G., Kao, J., Ritchie, L. (2011). To what extent have sweetened beverages contributed to the obesity epidemic? <i>Public Health Nutr</i> , 14.3, 499 - 509.	The California Endowment, California Center for Public Health Advocacy, CDC	Studies consistently show that higher intake of SSBs is associated with higher energy intake and adiposity. It is estimated that SSBs account for at least one-fifth of the weight gained between 1977 and 2007 in the US population.
Hu, F.B. and Malik, V.S. (2010). Sugar-sweetened beverages and risk of obesity and type 2 diabetes: Epidemiologic evidence. <i>Physiol Behav</i> , 100.2, 46 - 54.	Departments of Nutrition and Epidemiology, Harvard School of Public Health, Boston; Channing Laboratory, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston	Findings from epidemiological studies clearly indicate that regular SSB consumption can lead to weight gain and substantially increase risk of developing chronic diseases including metabolic syndrome, type 2 diabetes and chronic heart disease.

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<p>Babey, S.H., Jones, M., Yu, H, Goldstein, H. (2009). Bubbling Over: Soda consumption and its link to obesity in California. Los Angeles: UCLA Center for Health Policy Research and California Center for Public Health Advocacy.</p>	<p>The California Endowment</p>	<p>In California, there is a strong correlation between weight and soda consumption. Those who drink one or more sodas per day are 27% more likely to be overweight than those who do not drink soda, and soda accounts for 43% of the increase in calorie consumption over the past 30 years.</p>
<p>Chen, L., Appel, L.J., Loria, C., Lin, P., Champagne, C.M., Elmer, P.J., Ard, J.D., Mitchell, D., Batch, B.C., Svetsky, L.P., Caballero, B. (2009). Reduction in consumption of sugar-sweetened beverages is associated with weight loss: The PREMIER trial. <i>Am J Clin Nutr</i>, 89.5, 1299 - 1305.</p>	<p>NIH; Center for Human Nutrition, Johns Hopkins Bloomberg School of Public Health; Eunice Kennedy Shriver National Institute of Child Health and Human Development</p>	<p>Of individual beverages tested, only intake of SSBs was significantly associated with weight change. A reduction in liquid calorie intake had a stronger effect on weight loss than did a reduction in solid calorie intake.</p>
<p>Stanhope, K.L., Schwarz, J.M., Keim, N.L., Griffen, S.C., Bremer, A.A., Graham, J.L., Hatcher, B., Cox, C.L., Dyachenko, A., Zhang, W., McGahan, J.P., Seibert, A., Krauss, R.M., Chiu, S., Schaefer, E.J., Ai, M., Otokozawa, S., Nakajima, K., Nakano, T., Beysen, C., Hellerstein, M.K., Berglund, L., Havel, P.J. (2009). Consuming fructose-sweetened, not glucose-sweetened, beverages increases visceral adiposity and lipids and decreases insulin sensitivity in overweight/obese humans. <i>J Clin Invest</i>, 119, 1322 - 1334.</p>	<p>NIH; American Diabetes Association; USDA-ARS CRIS; Janet King of Children's Hospital Oakland Research Institute</p>	<p>The consumption of both fructose- and glucose-sweetened beverages led to weight gain. However, the data suggest that dietary fructose specifically increases hepatic de novo lipogenesis, promotes dyslipidemia, decreases insulin sensitivity, and increases visceral adiposity in overweight/obese adults.</p>

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Vartanian, L. R., Schwartz, M.B., Brownell, K.D. (2007). Effects of soft drink consumption on nutrition and health: A systematic review and meta-analysis. <i>Am J Public Health</i> , 97, 667 - 675.	The Rudd Foundation	Soft drink intake is clearly associated with increased calorie intake and body weight, lower intakes of milk, calcium, and other nutrients, and an increased risk of several medical problems, such as diabetes. Studies funded by the food industry reported significantly smaller effects than did non-industry-funded studies.
Malik, V.S., Schulze, M.B., Hu, F.B. (2006). Intake of sugar-sweetened beverages and weight gain: A systematic review. <i>Am J Clin Nutr</i> , 84, 274 - 288.	NIH; American Heart Association	According to a review of epidemiologic and experimental evidence, greater consumption of SSBs is associated with weight gain and obesity.
Bray, G.A., Nielsen, S.J., Popkin, B.M. (2004). Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. <i>Am J Clin Nutr</i> , 79, 537 - 543.	n/a	Increased use of high-fructose corn syrup in the United States mirrors the increase in obesity. In addition, dietary fructose may inhibit the body's ability to regulate food intake and thus result in the overconsumption of calories.
Schulze, M.B., Manson, J.E., Ludwig, D.S., Colditz, G.A., Stampfer, M.J., Willett, W.C., Hu, F.B. (2004). Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women. <i>JAMA</i> , 292.8, 927 - 934.	NIH	Higher consumption of sugar-sweetened beverages is associated with a greater magnitude of weight gain and an increased risk for development of type 2 diabetes in women, possibly by providing excessive calories and large amounts of rapidly absorbable sugars.

\*Funding from food/beverage industry or organizations representing industry

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