YALE RUDD CENTER
FOR FOOD POLICY & OBESITY

Study Synopses: Sugar-Sweetened Beverages (SSBs) and Satiety

Citation	Funder(s)	Conclusions
Cassady, B.A., Considine, R.V., Mattes, R.D. (2012). Beverage consumption, appetite, and energy intake: what did you expect? *Am J Clin Nutr* , 95, 587 - 593.	NIH	Study examined sensory and cognitive effects of liquid versus solid foods on consumption, as well as physical and endocrine variables. Results support findings that beverages are less filling than solid foods and pose a particular risk of consuming excess calories.
Pan, A., Hu, F.B. (2011). Effects of carboyhydrates on satiey: Differences between liquid and solid food. *Curr Opin Clin Nutr Metab Care* , 14.4, 385 - 390.	n/a	Evidence from a number of studies suggests that liquid carbohydrates generally are less filling than solid forms.
Drewnowski, A. and Bellisle, F. (2007). Liquid calories, sugar, and body weight. *Am J Clin Nutr* , 85, 651 - 661.	Center for Public Health Nutrition, University of Washington, Seattle; Institut National de Recherche Agronomique, Centre de Recherche en Nutrition Humaine -- Ile de France, Bobigny, France; American Beverage Association; Danone Vitapole*; National Institutes of Health for the Exploratory Center for Obesity Research	Questions the conclusion by some researchers that liquid calories are not detected by the body by pointing to studies in which weight loss was attributed to the regular consumption of sugar-containing meal replacement products.
Mourao, D.M., Bressan, J., Campbell, W.W., Mattes, R.D. (2007). Effects of food form on appetite and energy intake in lean and obese young adults. *Int J Obes,* 31, 1688 - 1695.	CNPq; Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil	On the days subjects consumed calories in liquid forms, the total daily calorie intake was significantly higher, presumably due to the poor satiating properties of sugar in liquid form.

Citation	Funder(s)	Conclusions
Van Wymelbeke, V., Béridot-Thérond, M-E., de la Guéronnière, V., Fantino, M. (2004). Influence of repeated consumption of beverages containing sucrose or intense sweeteners on food intake. *Eur J Clin Nutr* , 58.1, 154 - 161.	SEV, Bourg la Reine, France; French Ministère de la Recherche et de la Technologie (Programme AGROBIO-Aliments Demain); Regional Council of Burgundy (Dijon, France)	Study compared the influence of drinking sugared and non caloric beverages on food intake and hunger ratings. Results showed food intake was not reduced in response to extra calories from beverages and there was no change in hunger ratings.
Almiron-Roig, E., Chen, Y., Drewnowski, A. (2003). Liquid calories and the failure of satiety: how good is the evidence? *Obesity* , 4, 201 - 212.	Nutritional Sciences Program, School of Public Health and Community Medicine, University of Washington, Seattle, WA	When taken as a group, studies substantiate that solids are more satisfying AND that liquids are more satisfying. The timing and context of intake are more important a factor in satiety than whether energy is provided in liquid or solid form.
Raben, A., Vasilaras, T.H., Møller, A.C., Astrup, A. (2002). Sucrose compared with artificial sweeteners: Different effects on ad libitum food intake and body weight after 10 wk of supplementation in overweight subjects. *Am J Clin Nutr* , 76.4, 721 - 729.	Danish Research and Development; Programme for Food Technology; Danisco Sugar; Coca Cola*	Body weight, fat mass and blood pressure increased in the sucrose group; these factors decreased with the artificial sweetener group. Because approximately 70% of sucrose came from liquids, these results may reflect the less-satiating effect of liquid calories versus solid.
DiMeglio, D.P. and Mattes, R.D. (2000). Liquid versus solid carbohydrate: effects on food intake and body weight. *Int J Obes Relat Metab Disord,* 24.6, 794 - 800.	USDA	Subjects increased their body weight and BMI significantly when they consumed liquid calories (in soda) vs. when they consumed solid calories (jelly beans). Subjects compensated for calories consumed in solid form (jelly beans) by eating fewer calories than when they consumed calories in liquid form (soda). Body weight and BMI increased significantly only during the liquid "soda period."

*Funding from food/beverage industry or organizations representing industry

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