Body Weight and Indices of Adiposity are Similarly Affected by the Two Common Types of Fructose Containing Sugars, Sucrose and High Fructose Corn Syrup, When Consumed as Part of a Normal Diet

Zhiping Yu, Joshua Lowndes, Von Nguyen, Stephanie Sinnett, Shannon West, James Rippe
Rippe Lifestyle Institute, Celebration, FL

Introduction

•Excess sugar consumption has been singled out as a potential primary factor in the development of obesity and associated metabolic disorders, with fructose containing sugars being particularly strongly implicated.
•Pure fructose is rarely consumed in isolation. Instead it is typically commonly consumed along with other sugars, most commonly in the form of sucrose or high fructose corn syrup (HFCS)
•Acute studies have shown them to have equivalent metabolic effects, but few data exist on the longer-term metabolic effects of these two sugars when consumed at levels typical of the general population.

Methods

•This study consisted of sixty-four normoglycemic, normotensive individuals
  •Mean age 42.2 ± 11.7 years
  •Mean BMI 27.3
•Participants consumed low-fat, sweetened milk for ten weeks according to the following random group assignments:
  •8% total caloric intake provided by added HFCS or Sucrose (25th percentile level of fructose in the American diet)
  •18% total caloric intake provided by HFCS or sucrose (50th percentile)
  •30% total caloric intake provided by HFCS or sucrose (95th percentile)
•No structured diet was provided. Instead participants were asked to self regulate eating behavior based on their perception of hunger.
•Data were analyzed using a multivariate analysis of variance with repeated measures.

Results

Change in Energy Intake

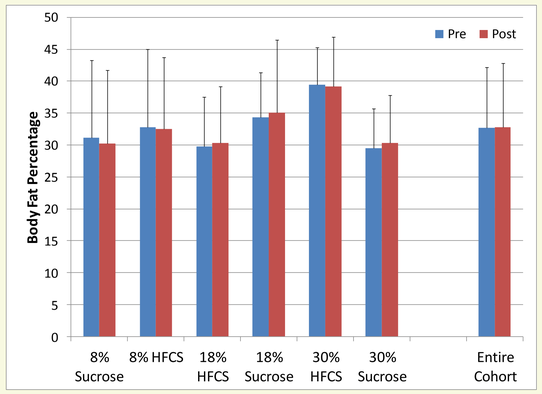
•Energy increased over the course of the study in the entire cohort
  •2020 +/- 716 vs 2445 +/- 750kcal (p<0..001)
•Changes were not different among the groups (p>0.05)

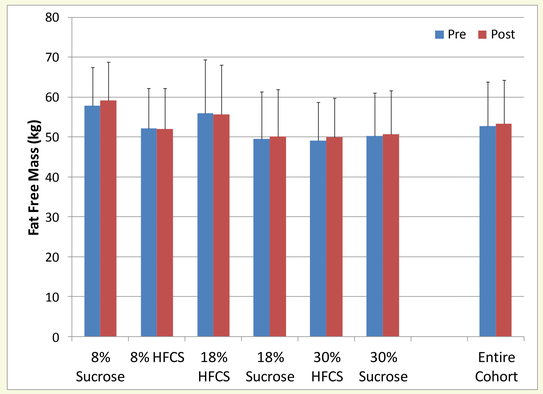
Change in Total Sugar Intake

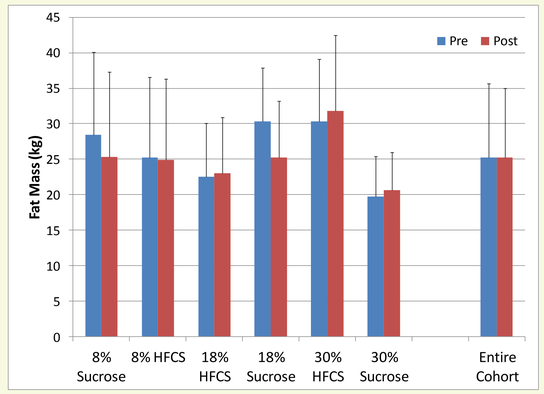
	8% Sucrose	8% HFCS	18% HFCS	18% Sucrose	30% HFCS	30% Sucrose	All
Pre	**103.8 ±44.9**	**102.7 ± 40.1**	**92.1 ± 51.2**	**85.3 ± 22.6**	**97.5 ± 26.5**	**100.1 ± 67.8**	**97.1 ± 43.5**
Post	**181.9 ± 61.2****	**139.9 ± 22.1**	**202.9 ± 54.1*****	**207.8 ± 54.8*****	**270.1 ± 48.2*****	**272.2 ± 103.4****	**215.5 ± 76.1*****

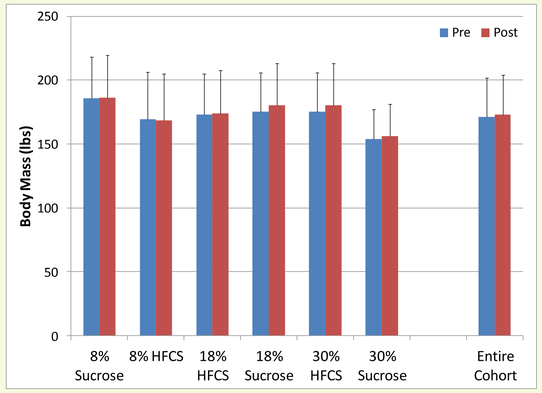
Different than pre, p<0.05 *, p<0.01 **, p<0.001 ***

Figures: Change in Body Composition









Time Effect >0.05 and time X group interaction p>0.05 in multivariate analysis.

Discussion & Conclusion

•Consumption of sugars across a wide span of intake levels did not lead to an increase in body mass or adiposity, even when consumed at the level equivalent of the 95th percentile for fructose.
•HFCS and sucrose showed comparable effects
•The maintenance of body mass and failure of adiposity to increase were observed despite food recall data showing an increase in caloric intake. This may indicate a limitation of food record data, but may alternatively indicate an increase in energy expenditure in response to the additional calories.

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