

The Effects of Average Consumption Levels of Fructose and Fructose Containing Sugars on Circulating Glucose, Insulin, Leptin and Active Ghrelin

Joshua Lowndes, James Rippe
Rippe Lifestyle Institute, Celebration, FL,

Introduction

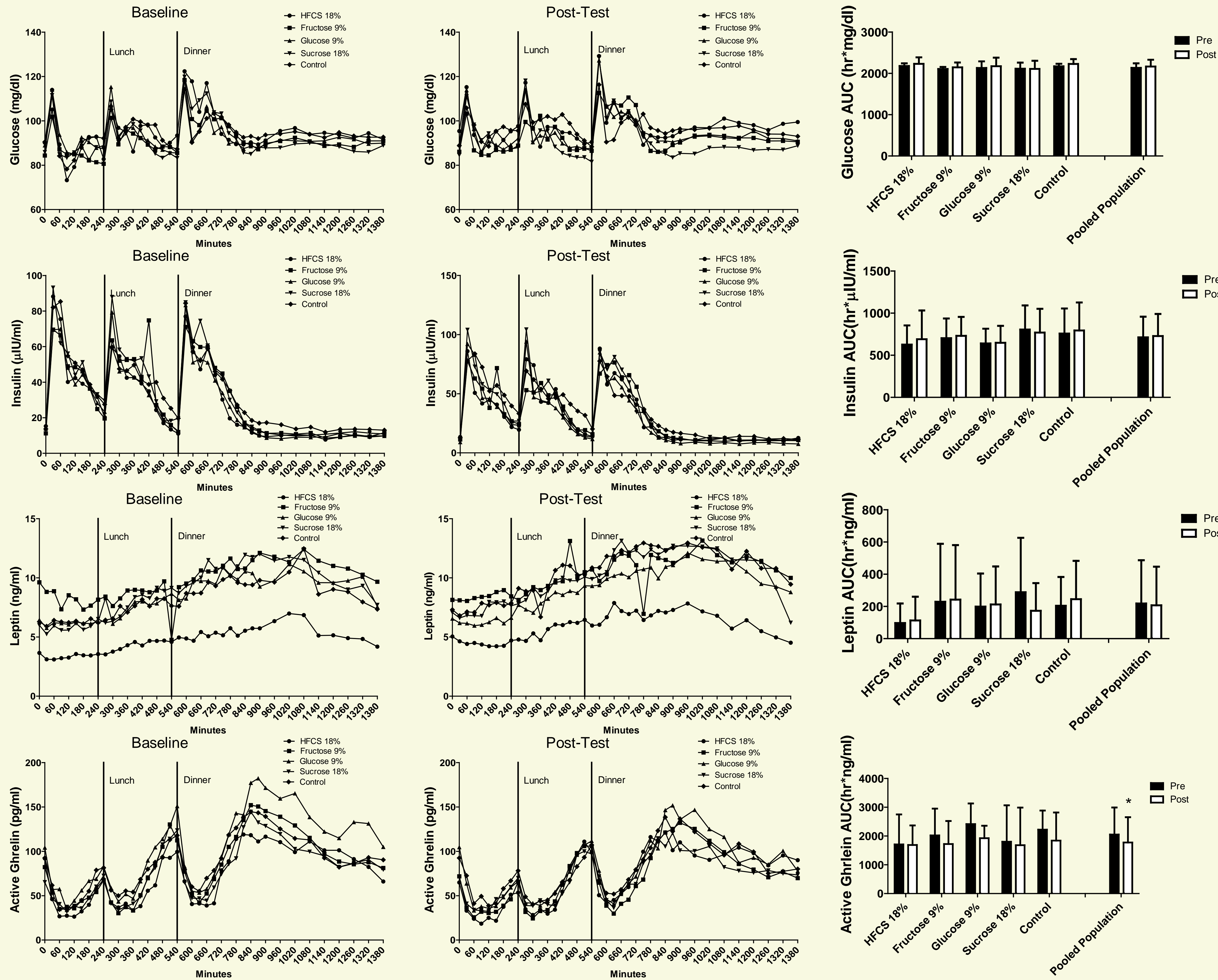
- Fructose has long been known to elicit a blunted glycemic response compared to other sugars.
- Accordingly, fructose elicits a blunted stimulus from the hormonal pathways involved in energy regulation.
- While this may explain how chronic consumption of pure fructose could promote weight-gain, such studies to have observed this have used experimental models that do not reflect how fructose is typically consumed, either in the type of sugar consumed or the amount.
- The purpose of the present study was to examine the effect on glucose and energy regulating hormones of fructose consumed at the 50th percentile level of American consumption (9% of calories) when consumed as part of a mixed nutrient diet either as pure fructose or, as is typically consumed, in combination with glucose (e.g. HFCS or sucrose).

Methods

- Forty-two weight-stable (weight change <3% in previous 30 days) individuals aged 20-60 years old drank sugar-sweetened low fat milk every day for 10 weeks as part of their usual diet (mean age 35.5 ± 10.5 years).
- The amount of milk consumed was individualized for each participant based on the estimated number of calories required to maintain body weight (Mifflin St Jeor equation) and random group assignment:
 - Groups 1 and 2 – 9% estimated caloric intake from fructose or glucose respectively added to milk.
 - Groups 3 and 4 – 18% of estimated caloric intake from HFCS or sucrose respectively added to the milk.
 - Group 5 consumed 9% of their estimated caloric intake as unsweetened, low-fat milk.
- Participants stayed in a metabolic ward for 24 hours at the beginning and end of the study during which standardized meals were provided and blood samples obtained at fasting and every 30 minutes until midnight and hourly from midnight until 8am.
- AUC for the entire day (23 hours) was calculated using the trapezoidal method.
- Differences in AUC from baseline to post-test, and the difference in the change among groups were analyzed via ANOVA with repeated measures using SPSS V18.0
- Data presented are mean ± SD

Results

Body weight increased in the entire study population (166.4 ± 27.0 vs 168.6 ± 29.2 lbs, p<0.001), but group assignment had no effect on weight. (p>0.05)



In all cases, there were no differences in response among the groups at baseline or post-test, p>0.05

* Different than baseline, p<0.05

Discussion & Conclusion

- These data suggest that experimental models of fructose induced insulin resistance are not applicable to the amount or way in which fructose is typically consumed by humans



Support for this study provided by a grant from the Corn Refiners Association