

No Effect of the Type of Sugar on Whole Body or Hepatic Insulin Resistance

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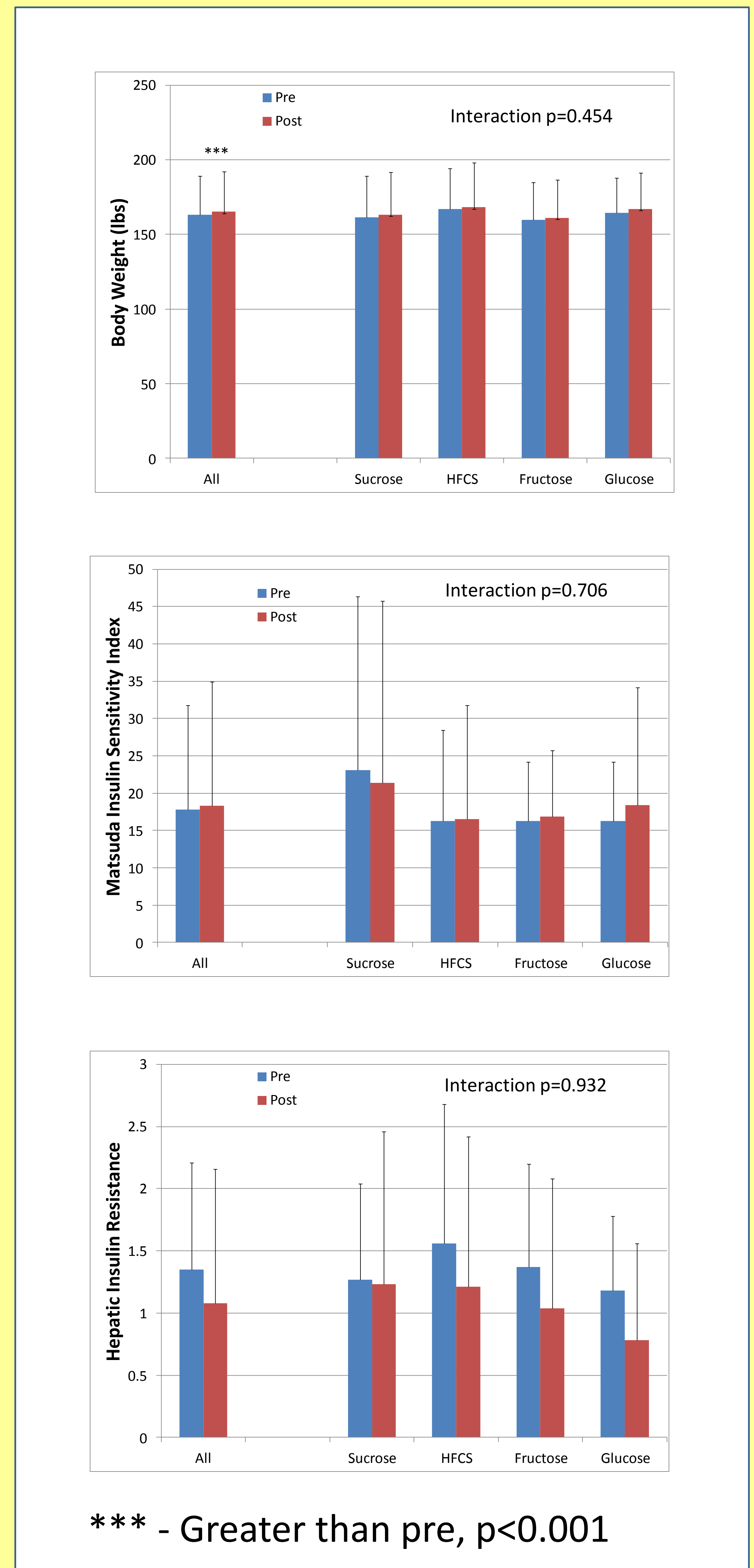
Introduction

- The metabolic processing of fructose is unique among dietary monosaccharides.
- The failure of fructose to stimulate insulin release has led to speculation on its potential role in the development of obesity and associated sequelae.
- Pathways through which high doses of fructose can promote insulin resistance have been elucidated. However, humans rarely eat fructose in isolation from other sugars and do so in amounts far below those that have been used experimentally.
- The purpose of this study was therefore to investigate changes in insulin sensitivity after daily consumption of the most common fructose containing sugars compared to consumption of pure fructose and pure glucose.

Methods

- 137 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.
- The amount of milk consumed was individualized for each participant based on the estimated number of calories required to maintain body weight (via 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
 - Intake in the fructose sugar groups was equivalent to the 50th percentile for consumption levels of fructose in the USA.
- A standard OGTT was performed either side of the ten week intervention.
- Matsuda Composite Index was calculated as a measure of whole body insulin sensitivity
 - $ISI = \frac{10000}{\sqrt{g_0 \times i_0 \times \left(\frac{g_0 \cdot 15 + g_{15} \cdot 30 + g_{30} \cdot 30 + g_{120} \cdot 15}{120} \right) \times \left(\frac{i_0 \cdot 15 + i_{15} \cdot 30 + i_{30} \cdot 30 + i_{120} \cdot 15}{120} \right)}}$
 - Diabetes Care 22: 1462-1470, 1999
- Hepatic Insulin resistance
 - $AUC_{30g} * AUC_{30I}$
 - Diabetes Care 30: 89-94, 2007
- Data were analyzed via two way ANOVA with repeated measures (4 group X 2 time).

Results



Conclusion

- These data suggest that short-term intake of dietary sugars at typical levels does not impair insulin sensitivity.
- Furthermore, whether or not the sugar contains fructose has no impact on the response.



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For questions please contact
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