

No Effect of Added Sugars Consumed at the Median American Intake Level on Glucose Tolerance or Insulin Resistance

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

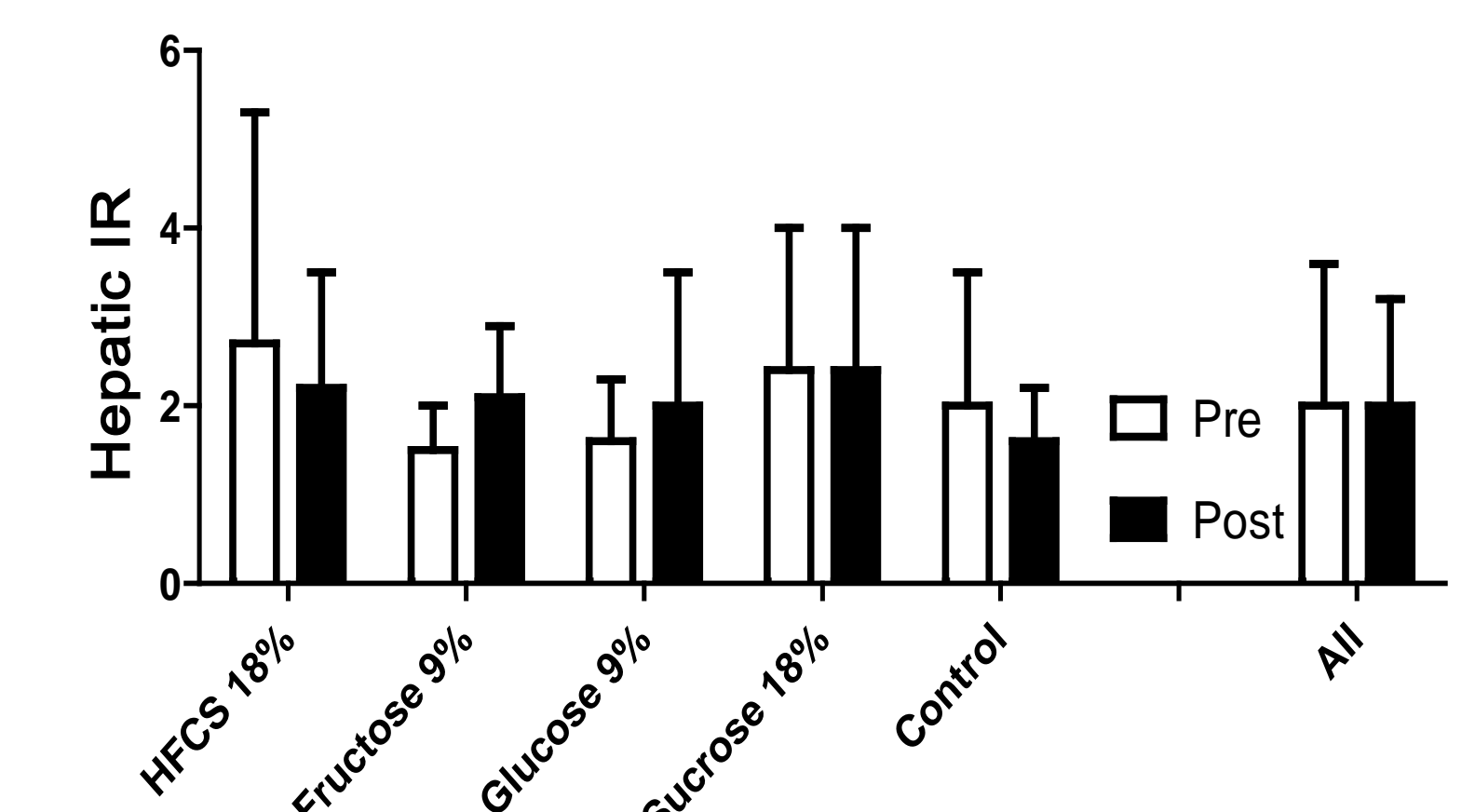
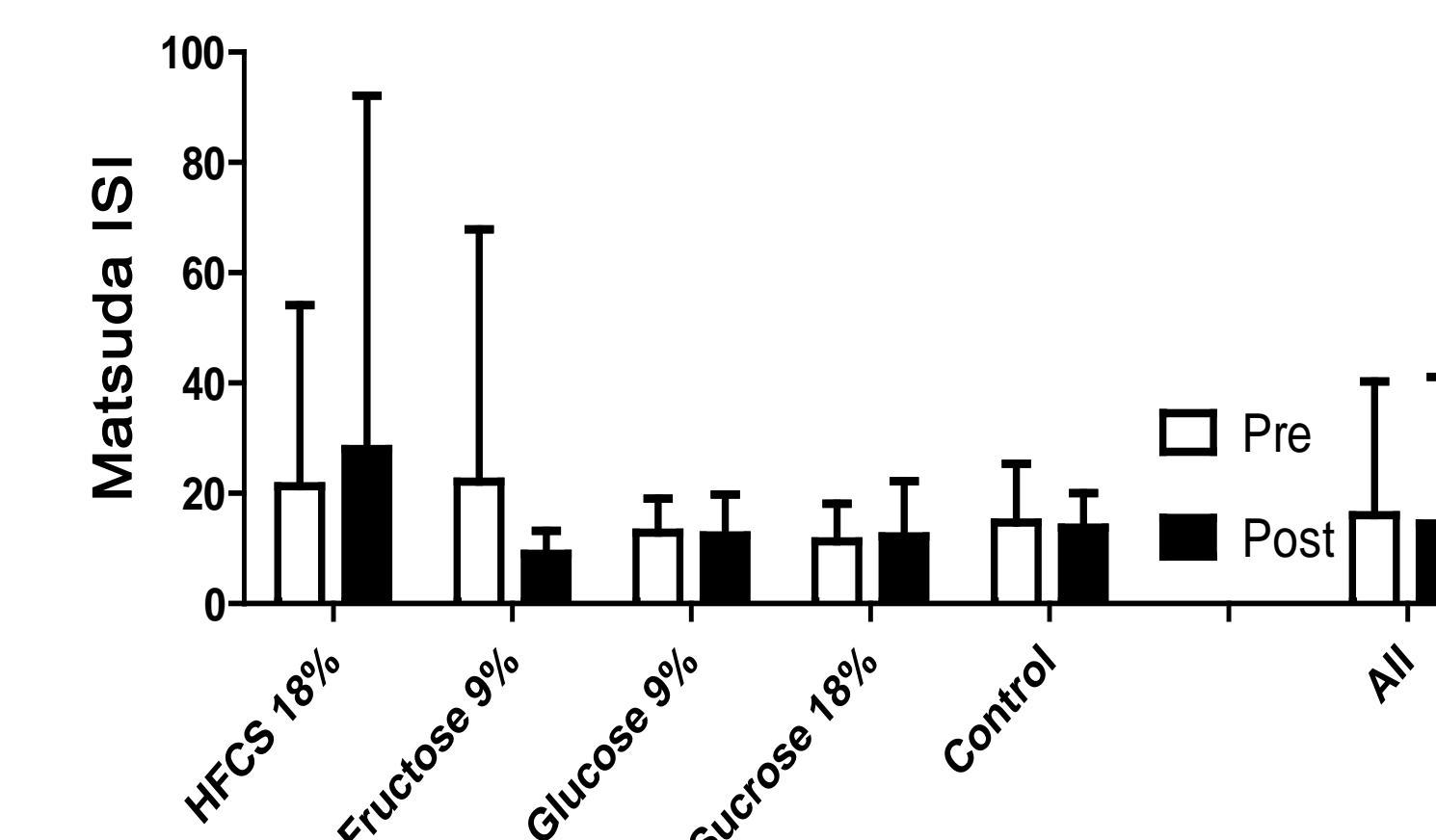
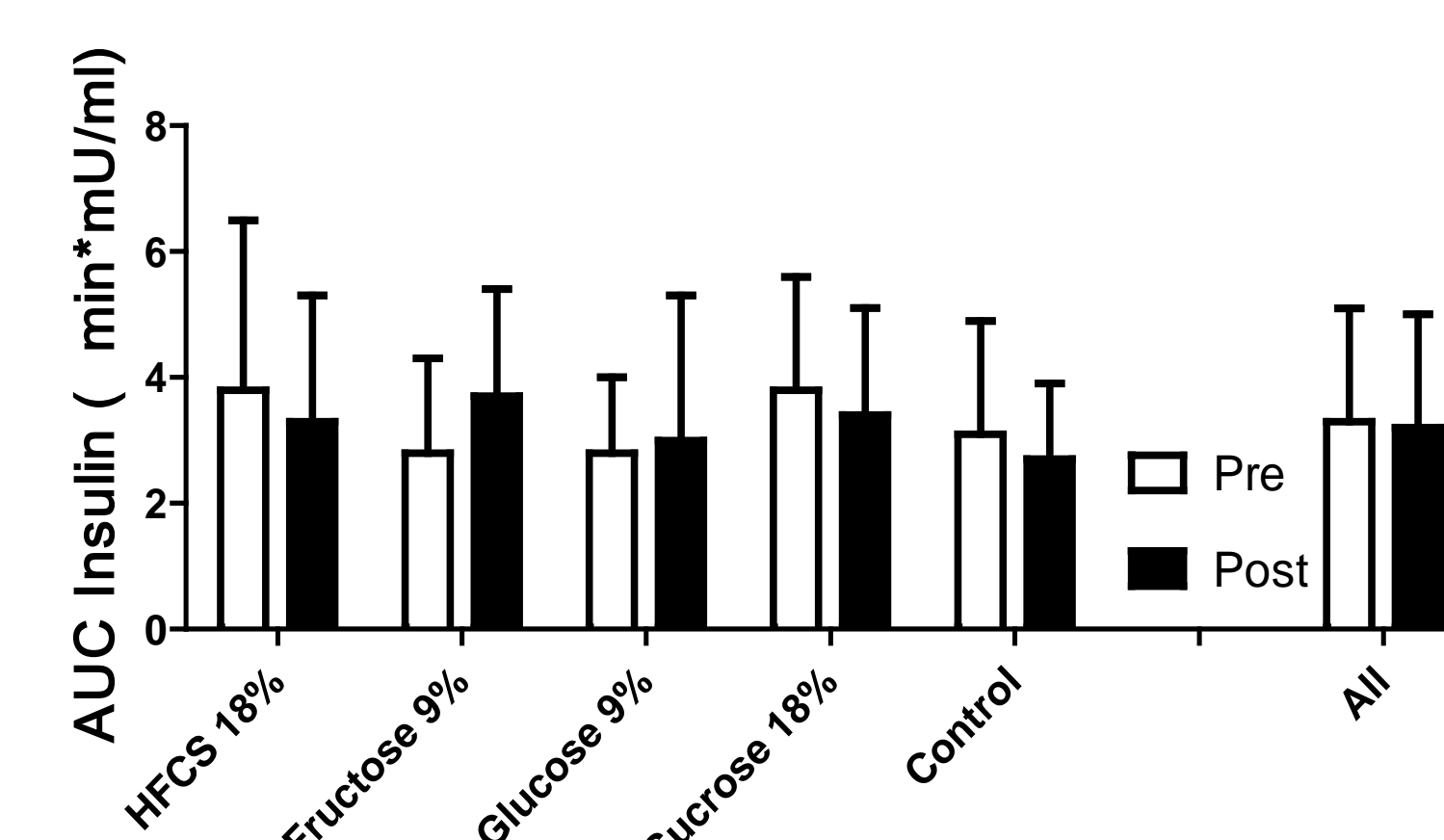
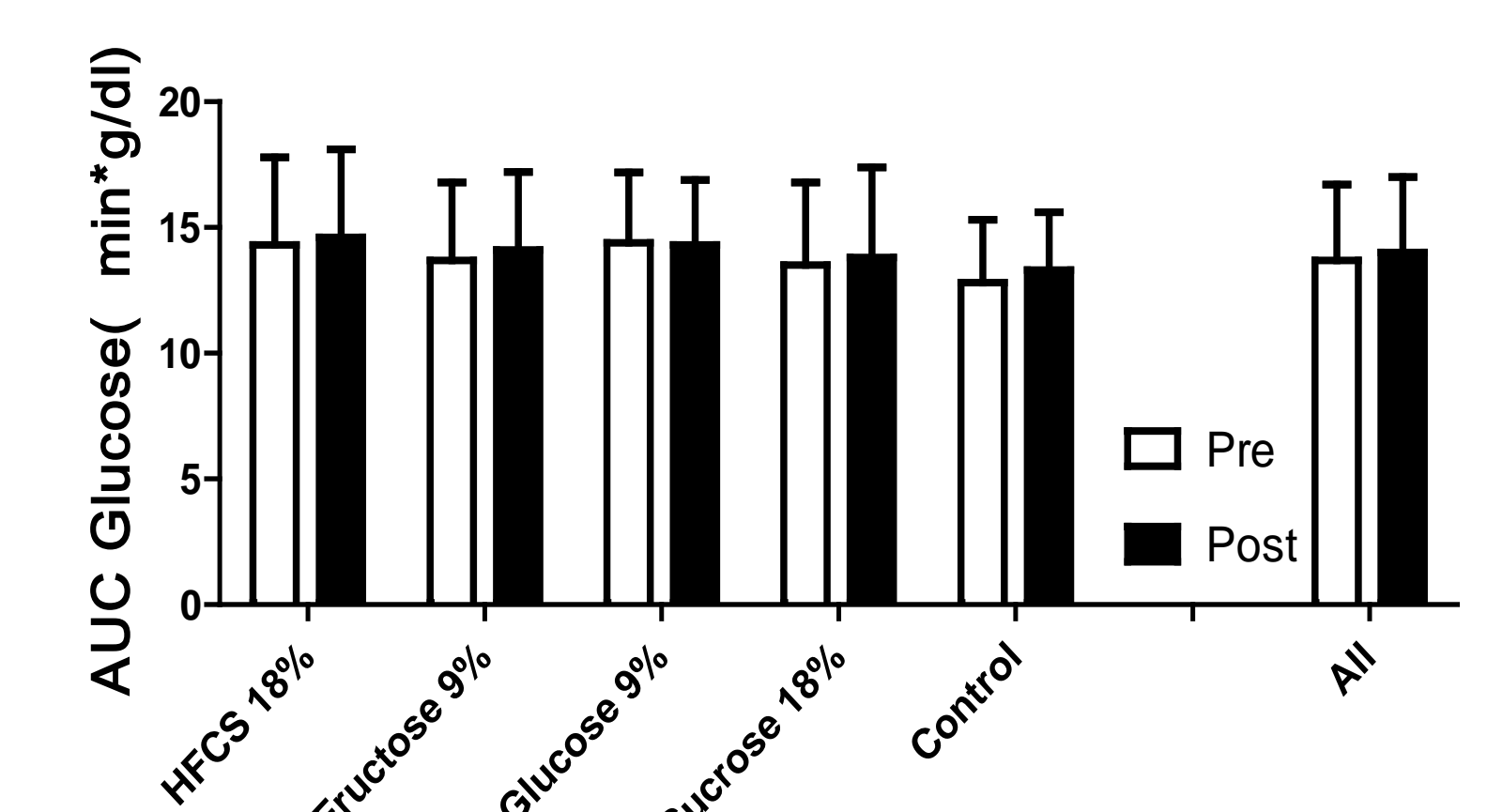
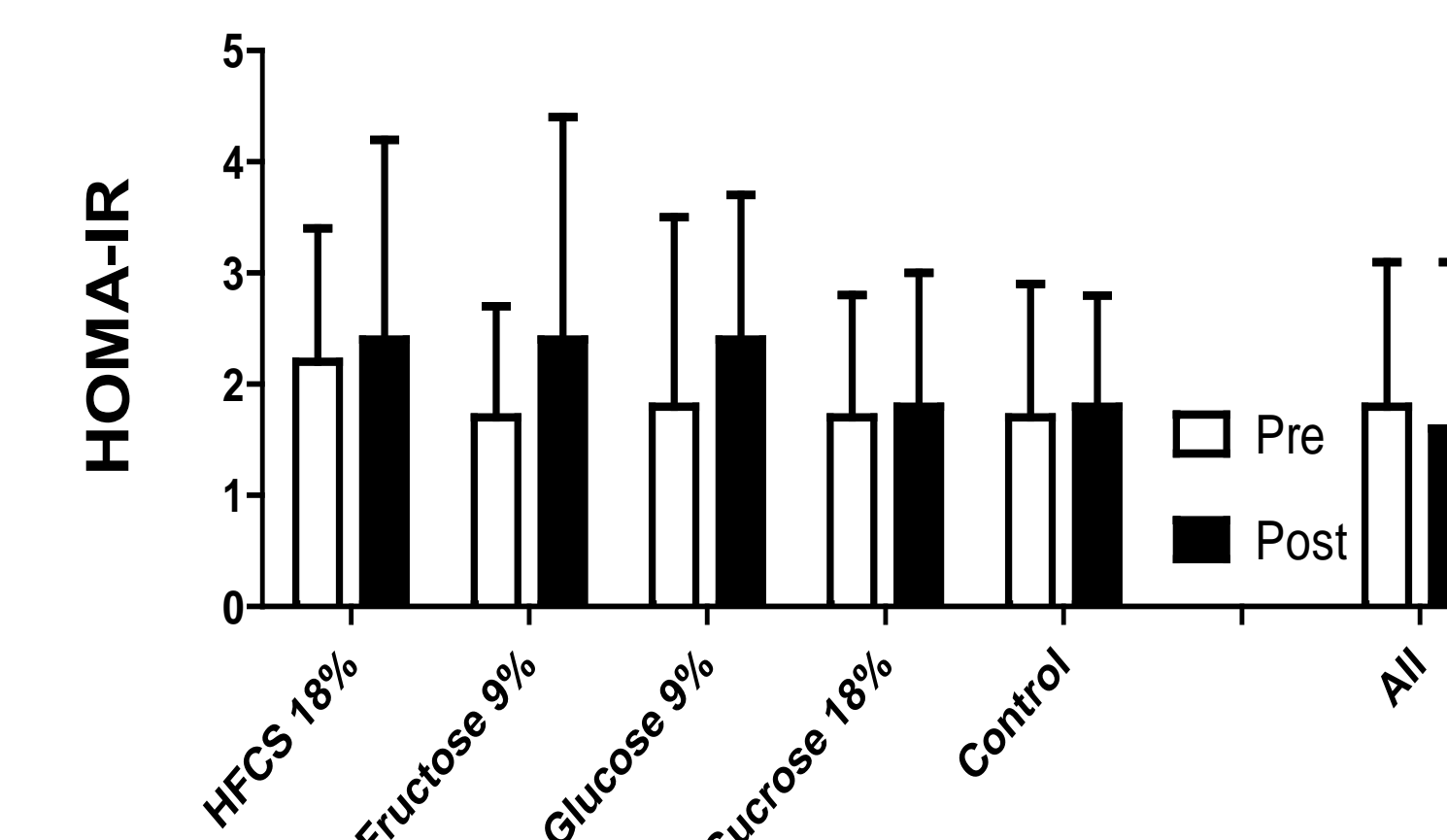
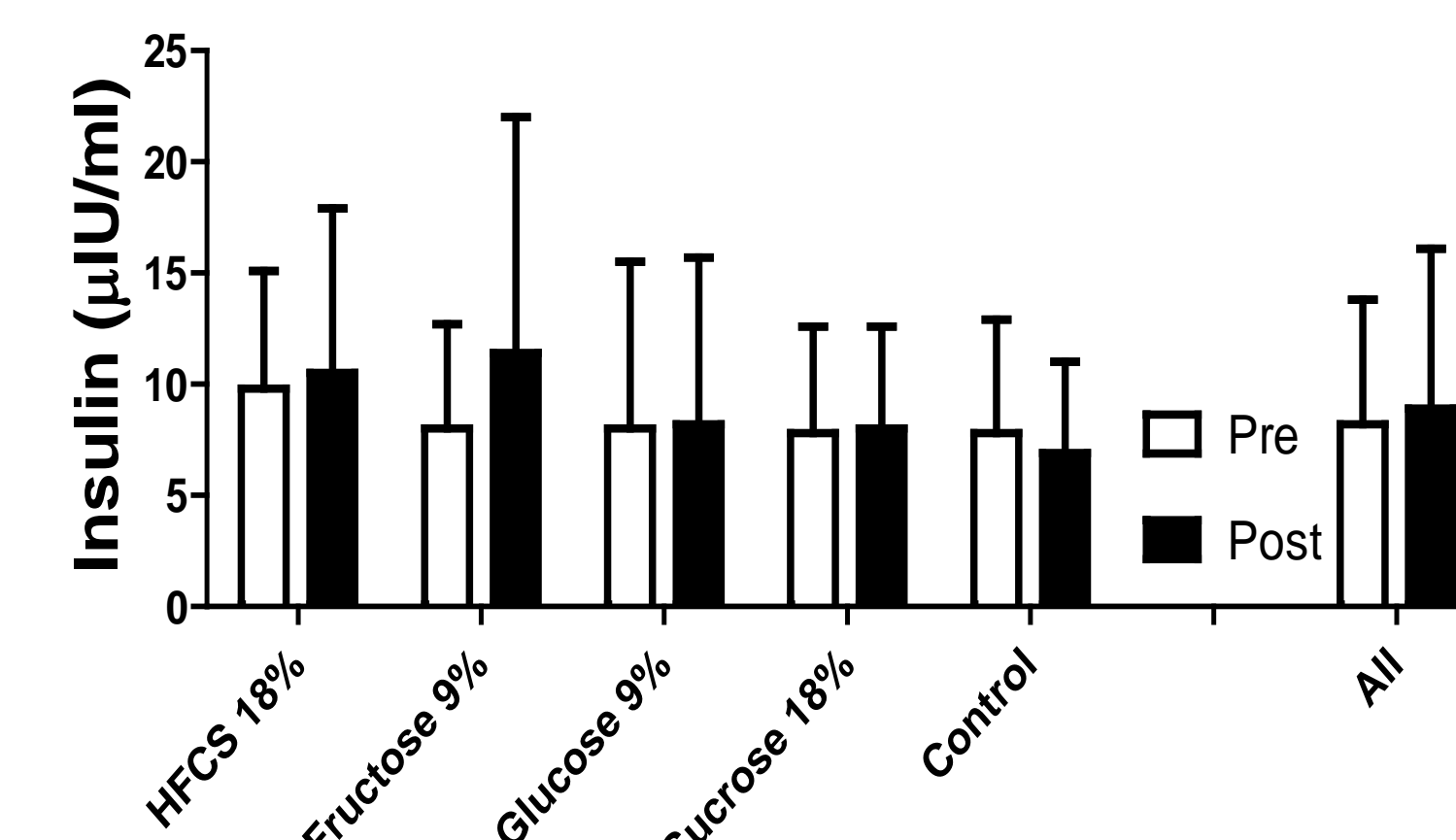
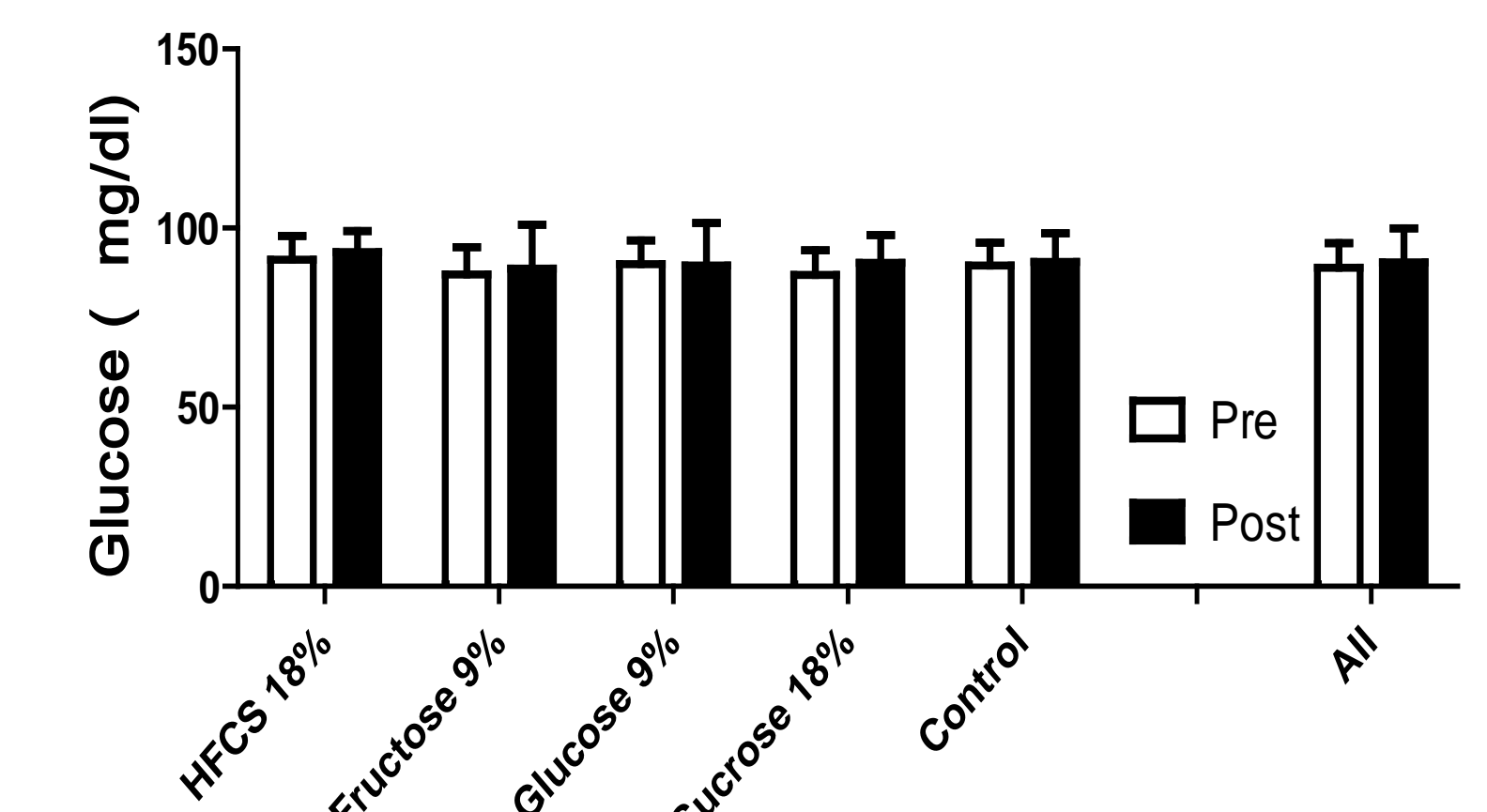
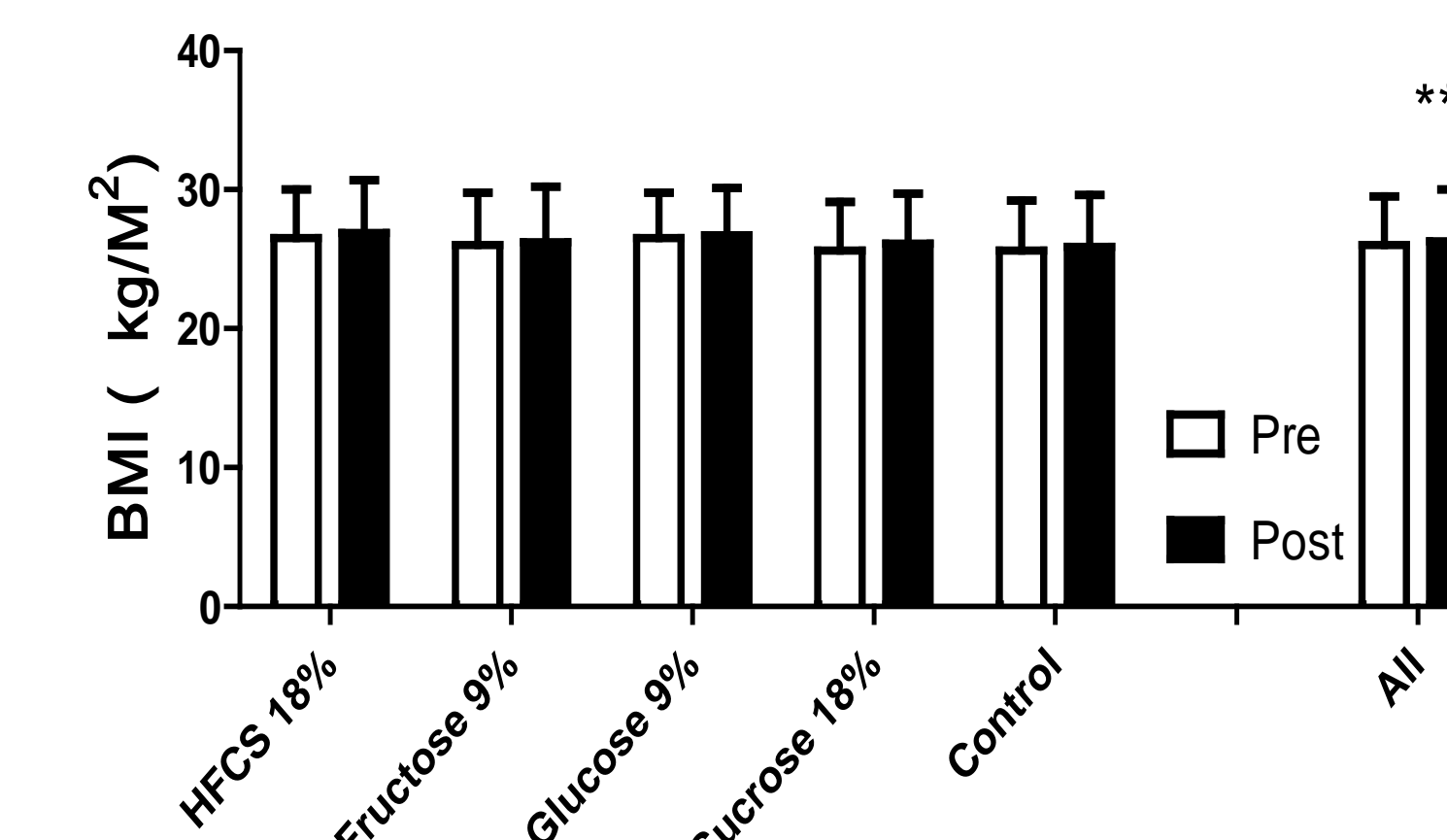
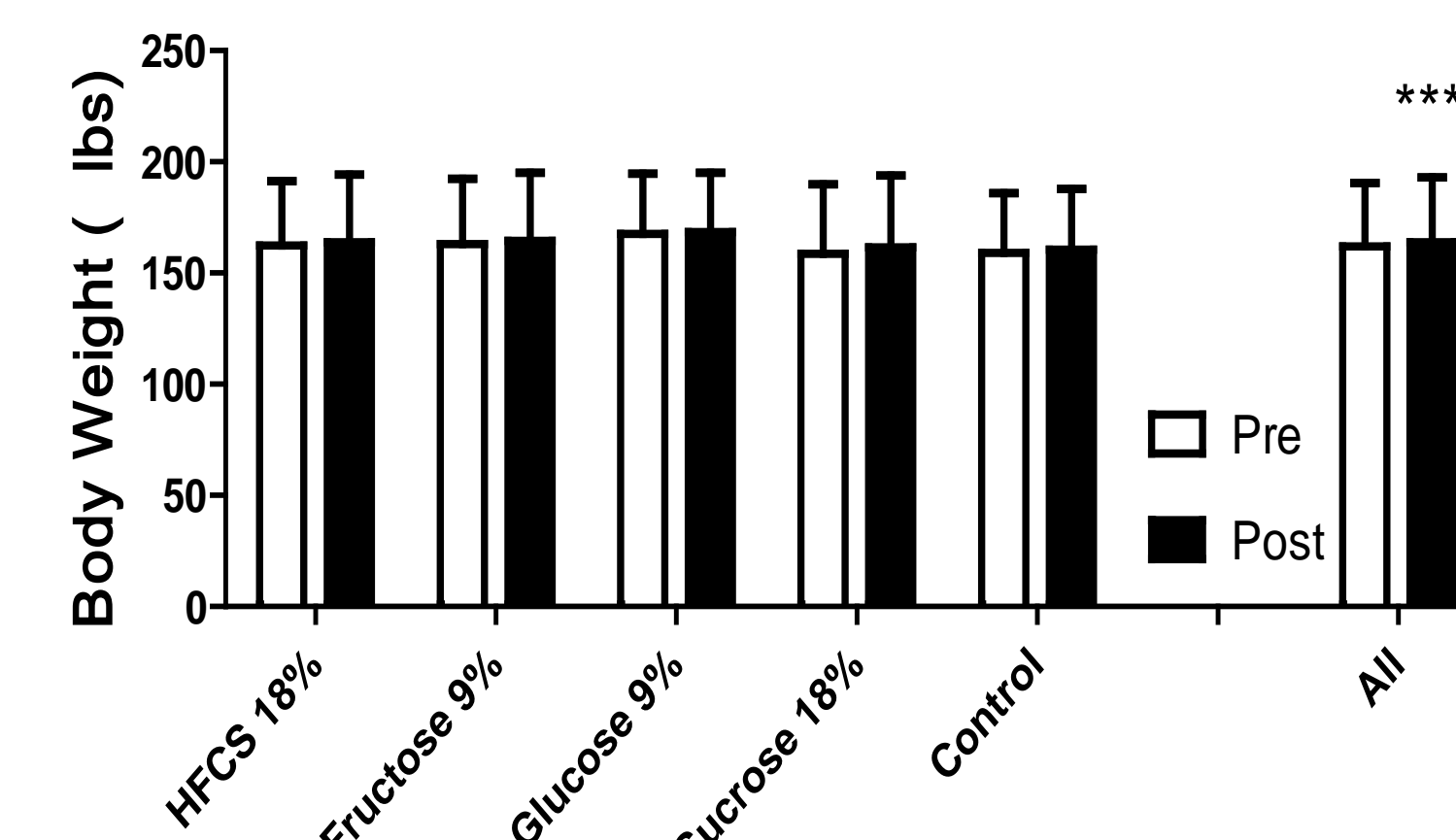
Introduction

- Fructose is metabolized differently than other monosaccharides and recent research has focused on how this difference may contribute to obesity and increasing cardiovascular disease risk.
- In particular, high levels of fructose consumption has been shown to promote changes in insulin resistance and associated parameters.
- However, studies that have shown such an effect have used experimental models that are drastically different than how fructose is typically consumed by humans – either using amounts far in excess of even the highest consumers and/or supplying it in isolation from other sugars or macronutrients.
- Debate continues over the effects of sugars at more typically consumed levels and whether the identity of the sugar consumed is important.

Methods

- This was a study with a ten week intervention that included 156 normotensive, normoglycemic, apparently healthy individuals who were weight stable (no change in weight greater than 3% over the past three months) prior to enrollment.
 - Male=69, Female=87,
 - Mean age 35.7 ± 11.4 .
- Participants were randomly assigned to one of five groups - four that contained low fat milk with added sugar in amounts equivalent to the 50th percentile of fructose consumption in the US, and one unsweetened low-fat milk control group.
- Milk was consumed in amounts so that the added sugar contributed a target percentage of the calories required for weight maintenance.
- The groups were as follows:
 - Fructose 9%, Glucose 9%, High fructose corn syrup (HFCS)18%, sucrose 18% and an unsweetened milk control in which milk contributed 18% of the weight-maintenance calories.
- The energy intake required for weight maintenance was estimated for each participant using the Mifflin St Joer equation and using an appropriate activity factor determined by responses to a physical activity questionnaire.
- Both before and after the intervention, subjects provided blood samples following a 12 hour fast and underwent a standard oral glucose tolerance test (OGTT).
- Area under the curve (AUC) was calculated for glucose and insulin using the trapezoid method.
- Data from the OGTT were also used to calculate whole body insulin resistance using the Matsuda Insulin Sensitivity Index (ISI) and Hepatic Insulin Resistance.
- Data were analyzed using ANOVA with repeated measures and are presented as mean \pm S.D.

Results



*** different than baseline, p<0.001

Discussion & Conclusion

- These data suggest that, when consumed at the median American intake, added sugars do not produce changes in measures of insulin sensitivity or glucose tolerance.
- Furthermore, at this level of consumption, the identity of the added sugar is not important.

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