Replicating a Randomized Controlled Trial that Establishes the Link Between High Fructose Corn Syrup and Obesity

Idea for Future Research

By James Sly

The alarming rise in obesity that has occurred over the last 35 years is one of the most critical public health dilemmas of our time. In another working paper, I present evidence establishing the link between the rise in obesity in the US and the introduction of high fructose corn syrup (HFCS) into soda (Sly 2018), and then summarize the evidence in a shorter policy memo (Sly 2020). One key piece of this evidence came from a randomized controlled trial (Yu et al 2013) that tested to see if beverages sweetened with HFCS had a different impact on obesity compared to beverages sweetened with sucrose (table sugar). In this study, participants were divided into three groups, a low sweetener group representing the 25th percentile of sugar consumption, a moderate sweetener group representing the median level of sugar consumption, and a high sweetener group representing the 90th percentile of sugar consumption that was given specially sweetened milk to drink every day, and then allowed to consume whatever other food they wanted during the other times of day. Each of these three groups were divided into two, where one group got milk sweetened with HFCS and the other got milk sweetened with sucrose, and then these groups were followed for 10 weeks to see what impact this had on weight. The study found that there was no difference in weight between the HFCS group and the sucrose group at the low levels sweetener, but the HFCS group weighed about 6-7 pounds more for moderate levels of sweetener, and about 11-12 pounds more for the high levels of sweetener. The problem was that each of the three groups only had 40 participants, 20 for the HFCS group and 20 for group consuming sucrose. That meant that even though those consuming HFCS did weigh substantially more than the sucrose group for the moderate and high levels of sweetener consumption, this result was not statistically significant because of the small sample size, and the researchers made the critical mistake of concluding that the lack of statistical significance meant there was no meaningful difference between HFCS and sucrose when it comes to the issue of weight gain.

One key research idea I would like to complete would basically replicate this study with a larger sample size (with a few other modifications) to see if a statistically significant difference between HFCS or sucrose can be established when it comes to weight gain. Ideally, this new study would divide participants into four groups, one for HFCS, one for sucrose, one for artificial sweeteners, and one serving as a control group. Each group would have about 250 participants rather than 20, and the study would only test the moderate levels of consumption. If possible, it would be nice if the length of the study could be extended from 10 to 15 weeks, and if this study were able to be completed, we would then have a rigorous test to see if beverages sweetened with HFCS have a different impact on obesity when compared to beverages sweetened with sucrose. Establishing the link between HFCS and obesity would be critical to solving one of our most severe public health crises of our time, and the best way to convince the scientific community and key policymakers would be through evidence coming from the

highest standard of research, the randomized controlled trial. The previous study provides us with a template about how the study could be conducted, and with key modifications a new study could provide the badly needed evidence we need to solve this ongoing public health crisis.

References

Sly, James. 2018. "Is there a link between HFCS and Obesity?" Unpublished working paper. February.

Sly, James. 2020. "Halting the Rise in Obesity in the United States." Unpublished policy memo. July.

Yu, Zhiping, Joshua Lowndes, and James Rippe. 2013. "High fructose corn syrup and sucrose have equivalent effects on energy-regulating hormones at normal human consumption levels." Nutrition Research, Volume 33, Issue 12, December 2013, pp. 1043-1052.