



communicating Food for Health

The Unique Adverse Metabolic Effects of Fructose

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A recent study suggests a lack of satiety and rewarding effects of fructose. Lead authors Dr Bettina Wölnerhanssen and Dr Anne Christin Meyer-Gerspach were concerned about ongoing research suggesting differing insulin levels and other metabolic effects associated with the consumption of high-fructose corn syrup (HFCS). There is evidence that, in large amounts and especially when consumed as a beverage, dietary fructose may pose some unique metabolic challenges for the human body. It is suspected that fructose (especially in beverages) may be promoting the development of various metabolic disorders, including obesity, fatty liver disease, elevated TG levels, type 2 DM, and gout (1).

It is well-known that the rise in blood glucose and insulin levels after a meal promotes satiety. Since dietary fructose has

much less impact on blood glucose and insulin levels than the same amount of glucose, the results were perfectly predictable. Indeed, by feeding the sugar solutions via a nasogastric tube directly into the stomach (thereby bypassing the mouth) the researchers took away another source of satiety that occurs when we eat sweet-tasting foods. Fructose is sweeter than glucose and so the satiety signals from the mouth are greater for fructose, but the tube feeding eliminated the taste of the sugar solutions. Of course, the taste sensations generated from eating whole fruit are much greater than those generated by drinking fruit juice, because the former spend far more time in the mouth where the sugar is tasted for a much longer time.

In addition to the prolongation of the sweet taste, there is also evidence that the fiber content and the chewing required by consuming whole fruit versus fruit juice not only results in the

(continued on next page)

August '15

Professional Member Edition

Research

How Exactly Does Fructose Impact the Body?

Practitioner Ideas

Interactive Display Ideas for Family Meals Month

Client and Consumer Education

Handouts: Recipes and Cooking Tips

1. Spaghetti with Meatballs
2. Farmers' Market Salad

This Month's Handouts

1. Packed Lunches Can Pack a Nutritional Punch
2. Do Processed Foods Belong on Your Table?
3. Be a Serving Size Sleuth
4. Diabetes and Alcohol

Online: Clipart, Calendar, Recipes, PDF Handouts, Articles, This Month, Newsletter Archive

It does appear that all of these sweeteners may have some unique metabolic effects due to their high fructose content.

sugar impacting the taste buds far longer than occurs with a sugar-sweetened drink, but may also enhance satiety via satiety signals from the stomach. Solid foods sit in the stomach far longer than drinks and when food is in the stomach longer, this suppresses the release of ghrelin (the hunger hormone) into the blood from cells in the stomach. The soluble fiber (pectins) and the insoluble fibers found in whole fruits are known to not only delay gastric emptying but also result in additional satiety signals being sent to the brain. Dietary fiber, when passing through the intestines, also prolongs satiety after a meal via a variety of mechanisms that are still being worked out. Some of the prolonged satiety effects of whole fruits may include alteration of the gut microbes in ways that not only help reduce fat storage but also may improve health in other ways.

So while Dr. Meyer-Gerspach suggests that her study indicates the use of HFCS may be promoting weight gain obesity because of reduced satiety and results in a dangerous product that promotes obesity in

some unique way, this conclusion would be premature. Why? First off, HFCS is not pure fructose but instead is actually a mixture of fructose and glucose. Indeed, it is well known that there is no meaningful difference between the metabolic effects of sucrose (a disaccharide with one molecule of fructose and one molecule of glucose) and HFCS (which is typically about 55% fructose and 45% glucose). Nor is HFCS any different nutritionally than the fruit juice concentrates (FJC) found in so many “health-food” cookies, cakes, breakfast cereals, etc. Why? The commercial FJC are typically made from apple, pear, and grape juices that have had their nutritional minerals and vitamins removed in processing. Like HFCS, they too have a bit higher ratio of fructose to glucose than the 50-50 mix seen in refined sugar or sucrose. But at least those “health foods” are solid and may contain some fiber from whole grains, nuts, or dried fruits so that their satiety per calorie value is likely still much greater than would occur if one were to consume that same sugar (HFCS, FJC, or sucrose) in a beverage. As bad as a soft drinks

sweetened with HFCS likely are for those trying to lose excess weight and keep it off, they are not unique in this regard. Most research suggests the impact of HFCS, sucrose, and FJC on one’s weight would likely be very similar. Indeed, the satiety per calorie ratio of HFCS sweetened drinks are likely little different than the same calories from even fresh squeezed fruit juice. Replacing HFCS drinks with fruit juice would simply make one a better nourished overweight person because of their vitamin and mineral content. There is no data showing fruit juice is more satiating per calorie than HFCS sweetened drinks. So the results of this recent study do not demonstrate that HFCS is likely more fattening than sucrose or commercial FJC because the researchers did not use HFCS, but rather compared pure fructose to glucose solutions. Such data tell us nothing about the relative effects of HFCS-sweetened drinks with a similar fructose and glucose content. Recall also that this study fed just fructose or glucose alone via a (Continued at <https://foodandhealth.com/metabolic-effects-fructose/>).

Interactive Display Ideas for Family Meals Month

August is Family Meals Month. Make the most of this holiday and inspire your clients to eat healthfully, all with a single display.

Interactive displays promote engagement, boost information retention, and add visual interest to a space.

To create a display for Family Meals Month, the first thing you need to do is consider your space. Is there an area that can remain safely undisturbed by other educators, gatherings, and projects? Can your clients reach it? Is it in a location where they could spend some free time perusing it? How long will people have access to the space? Under what circumstances?

If your space is easily accessible to your clients, then you

can make an interactive display. If the space is visually accessible, but not physically accessible, don't worry! You can make a regular display with a few simple variations.

Components of Your Display:

Mix and match some of the ideas below to create a compelling and memorable display for Family Meals Month.

- Photos
 - Include pictures of healthful and balanced meals that can be served to a whole family.
 - To make this interactive, have your clients take pictures of the meals that make them the most proud. Offer supplies for adding those photos to the board and write down instructions for how to do so and any criteria that the meals must meet (i.e. nutrients, empty calories).

- Recipes
 - Print a few recipes for meals that you know are nutritious and come together quickly.
 - To make this interactive, have clients print up their favorite healthful recipes and add them to the board.
- Meal Makeover Flaps
 - Cut out a picture of an unhealthy meal and affix one edge of it to the bulletin board.
 - Underneath the flap you created, write a recipe or include a photo of a healthful version of that meal, made over to add more nutrients.
 - Repeat with other meals.
- Menu Planning
 - Offer an area for people to write down the meals they plan to make this week.
 - Do a sample weekly menu as a guide.

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