

Executive Summary

For the past decade, high fructose corn syrup (HFCS) has played a prominent role in both the scientific and public debates over the health effects of nutritive sweeteners. It is used by manufacturers in place of ordinary sugar (sucrose) in many sweetened beverages and processed foods. In 2004 an article published in the *American Journal of Clinical Nutrition* argued that consumption of HFCS, particularly in sweetened beverages, may contribute to the obesity epidemic.

This claim stimulated a flood of research as well as efforts to reduce consumption of HFCS. Ordinary consumers depended on news media accounts to decide for themselves whether their intake of HFCS might be hazardous to their health. Thus, reporting on HFCS provides a valuable case study on how the media treat long-running scientific controversies with implications for both public health and public policy.

We selected eleven one-month time periods from 2004 to 2013 that included the release of significant scientific information on the health effects of HFCS in relation to other nutritive sweeteners. In addition to the original 2004 article that set off the controversy, these included five releases of information that supported the article's claims and another five that questioned or challenged them. We analyzed both the news coverage of these research reports and the broader coverage of the debate over the health effects of HFCS and other nutritive sweeteners during these time periods.

From a sample of 120 print and electronic news outlets, we identified 567 stories containing 1512 statements assessing the health effects of nutritive sweeteners. In addition to tracking the distribution of coverage and opinion, we examined the role of scientific information in the coverage. This included the use of expert opinion and the details that news reports provided about the studies they cited.

Major Findings:

- When we examined five research reports that criticized HFCS and five that defended HFCS, over 90% of the coverage went to the reports that criticized HFCS.
- Since the Academy of Nutrition and Dietetics issued a statement in 2012 concluding that HFCS and sucrose are *equivalent* in their metabolic and health effects, 71% of news sources have argued the opposite -- that they are *different*. Ironically, before the AND statement appeared, 63% of sources agreed that they were equivalent.
- All nutritive sweeteners were portrayed as proven or suspected causes of adverse health effects by over 80 percent of sources cited.

- HFCS was portrayed as a proven cause of obesity or other adverse health effects by 37% of sources and as a suspected cause by 46%, only 17% rejected a connection with adverse effects.
- Five scientists accounted for almost half (43%) of all opinions from experts who were named. All five have been active in public policy proposals to limit consumption of nutritive sweeteners.
- Nearly half of all experts cited (46%) were not named (e.g., “scientists say”), and a majority of opinions from experts (58%) did not cite any scientific evidence.
- Most reporting on new studies failed to mention important details of the research, such as how the sample was selected, whether the results were statistically significant, and whether any reported association indicated a causal relationship.
- Only one news story out of six placed the findings from a new study in the context of earlier findings on the same topic.

Conclusion:

Our research concludes that HFCS was usually portrayed in the media as a health risk, but not necessarily as more of a risk than other nutritive sweeteners. Most opinions in the news portrayed HFCS as a proven or suspected cause of obesity and other negative health outcomes.

Among a selection of research reports on both sides of the issue, coverage of information claiming that HFCS posed a unique health risk dramatically outpaced coverage of information questioning or challenging that claim. In addition, the release of an official statement by the American Dietetic Association, a leading professional organization, was followed by coverage that emphasized voices arguing for the opposite conclusion.

We also documented a number of questionable aspects of the reporting of science that are well known from studies of other scientific controversies. For example, a few publicly engaged scientists played an outsized role in the portrayal of expert information to the general public. Study findings were frequently reported without the detailed information news consumers would need to evaluate the validity or implications of the findings for themselves. These details are not trivial. For example, it is difficult to evaluate a study without knowing whether its findings are statistically significant.

Finally, we found that the reporting of scientific information about nutritive sweeteners often reflected news values to the detriment of scientific values. In short, insufficient attention was given to the context in which new information is interpreted. Newly released studies were often presented as unique events rather than as one more link in an ongoing chain of knowledge, in which each study builds on our knowledge from previous studies. To scientists, any new study represents one more piece in a puzzle;

too often, the more newsworthy findings seem, the more the media treats them as solving the entire puzzle.

This study was conducted by the Center for Media and Public Affairs at George Mason University. It was supported by a grant from the Corn Refiners Association.

Media Coverage of HFCS and Other Nutritive Sweeteners

**A report by the Center for Media and Public Affairs at
George Mason University**



Introduction

Over the past several years, CMPA has engaged in numerous studies that have looked in different ways at how the media treat the problem of excessive weight and obesity. Previous work has examined the role of fats in weight management, the impact of poor portion control on weight gain, how energy balance can affect weight, and the debate over taxing or limiting the size of sodas.

In this study, which was supported by a grant from the Corn Refiners Association, we examine media coverage of the debate over the health effects of high fructose corn syrup (HFCS) and other caloric sweeteners in the American diet. Beyond the basic pros and cons of the debate we also sought to understand the role science played in the debate over caloric sweeteners. We employed the social scientific research technique of content analysis, which is described in an appendix to this report.

The study covers selected periods from the past ten years, beginning with the publication of a study by Drs. George Bray, Samara Nielsen, and Barry Popkin in the *American Journal of Clinical Nutrition*¹, which suggested a causal link between rising HFCS consumption and rising obesity rates.

Proceeding through a series of snapshots over the ensuing decade this study mapped the arguments over which aspects of health are definitely or could be affected by sweetener consumption. Our analysis provides a comprehensive analysis of the ups and downs of the health debate. This mapping also provides insights into the language used in the debate as well as the voices in the debate.

In addition to the debate over the health effects of caloric sweeteners the analysis also looked at several specific comparisons between HFCS and sugar. These differences have been the focus of recent research and continued debate. It is one component of the larger discussion of how sugar fits into a healthy diet.

To understand the role science played in all of these debates and comparisons we identified to sources to understand how various experts are used in reporting. As a part of categorizing opinions on the health effects of sweeteners the analysis noted whenever an opinion was bolstered by referring to scientific research.

This analysis also looked at how thoroughly media accounts reported details of research studies. Such details are important for readers to assess the quality and applicability of information they are receiving.

¹ <http://ajcn.nutrition.org/content/79/4/537.full>

Sample and Methodology

Time Periods

As noted above, widespread scientific and public debate over the health effects of HFCS began around a decade ago, with the publication in 2004 of a research paper by George Bray, Samara Nielsen, and Barry Popkin in the *American Journal of Clinical Nutrition* suggesting a connection between rising HFCS consumption and rising obesity rates.

High fructose corn syrup and the entire field of caloric sweeteners has been a frequent subject of media coverage since that time. The coverage has ebbed and flowed, with attention increasing when new studies, books aimed at popular audiences, regulatory initiatives, etc. emerged and falling off in the absence of such newsworthy events. The public debate over obesity alone has generated a huge volume of coverage of potential causes, which has prominently featured nutritive sweeteners.

In order to reduce the volume of coverage and focus on the role that science has played, we needed to develop a sampling strategy that would allow for a meaningful examination of the coverage over time. Since our interest lay in understanding how science informs the debates over HFCS and other sugar forms, we built our sampling periods around the occurrence of significant research presentations, such as the release date of a study appearing in a scientific journal or the delivery of a research paper at a professional conference.

This allowed us to determine the degree to which a research event became a news event. It also allowed us to see whether such events had secondary effects of stimulating additional coverage of the health and policy issues raised by the newly released research, even when the research itself was not mentioned.

Based on our experience in previous studies on food and nutrition reporting, we anticipated that studies would cause a spike in coverage; then, after a few days, coverage would return to “normal” or background levels. To identify this pattern we examined coverage of the two weeks preceding a study’s release and the two weeks following the release.

The result was a one month long snapshot surrounding the release of each of our selected research events. When examining monthly magazines, we expanded the date range to cover the month preceding a study release and the month following the release to better capture any relevant stories.

Finally, because we wanted our study to capture the scientific debate over the health effects of HFCS and other caloric sweeteners, we selected not only presentations that posited negative health effects, but those that challenged a causal link between the two.

We chose the 2004 Bray, Nielsen, and Popkin article as the starting point and identified ten additional significant research presentations over the course of the next decade. Five of the ten provided support for the ill effects of HFCS, while five others challenged claims that HFCS is harmful above and beyond other nutritive sweeteners.

This structure also allowed us to compare and contrast media coverage of different types of research results. In addition to seven articles in refereed journals, we included two presentations at the annual meetings of professional societies (by Dr James Rippe, a prominent critic of the argument that HFCS causes obesity), a signed editorial in a journal by Dr Eric Neilson (a proponent of the argument that HFSC contributes to “the sweetener epidemic”) and an interview in a trade magazine in which Dr. Popkin stated that he was wrong in singling out HFSC for making a unique contribution to the obesity epidemic. (Instead, he indicted all nutritive sweeteners equally.)

The list of the selected research presentations and the associated study periods from 2004 to 2013 appears in the following table. In this table, time periods one, two, four, six, nine, and ten contain research presentations that asserted a health risk from HFCS. Periods one, three, five, seven, eight, and eleven contain research presentations that called into question a health risk from HFCS.

Table 1
Selected Research and Sampling Periods

<i>Study</i>	<i>Dates</i>
1. <u>American Journal of Clinical Nutrition</u> : <i>Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity</i> : George A Bray, Samara Joy Nielsen, and Barry M Popkin	3/23/04 – 4/21/04
2. <u>Journal of the American Society of Nephrology</u> : <i>The Fructose Nation</i> : Editorial by Dr. Eric G. Neilson	9/1/07 – 9/30/07
3. <u>Food Navigator</u> : <i>Fructose in the Firing Line</i> : Interview with Dr Barry Popkin	9/1/09 – 9/30/09
4. <u>Pharmacology Biochemistry and Behavior</u> : <i>High-fructose corn syrup causes characteristics of obesity in rats: Increased body weight, body fat and triglyceride levels</i> : Miriam E. Bocarsly, Elyse S. Powell, Nicole M. Avena, and Bartley G. Hoebel	3/8/10 – 4/6/10
5. <i>No Differences Found for Cardiovascular Disease, Weight Gain, Diabetes with Either HFCS or Sucrose</i> : James M. Rippe, MD of the Rippe Lifestyle Institute and Central Florida University – presented at ENDO 2010: The 92nd Annual Meeting and Expo of the Endocrine Society	6/5/10 – 7/4/10
6. <u>Obesity</u> : <i>Sugar Content of Popular Sweetened Beverages Based on Objective Laboratory Analysis: Focus on Fructose Content</i> : Emily E. Ventura, Jaimie N. Davis and Michael I.	10/13/10 – 11/11/10

Goran

7. ***HFCS & Sugar: Studies Show No Meaningful Difference: Obesity and diabetes rates continue to rise despite decline in consumption of sweeteners.*** James M. Rippe, MD, Presented at the American Society of Hypertension (ASH) Annual Meeting 5/10/11 – 6/10/11
8. International Journal of Obesity: Lack of evidence for high fructose corn syrup as the cause of the obesity epidemic: by D M Klurfeld, J Foreyt, T J Angelopoulos and J M Rippe 9/4/10 – 10/3/12
9. Global Public Health: High fructose corn syrup and diabetes prevalence: A global perspective: by Michael I. Gorana*, Stanley J. Ulijaszekb and Emily E. Ventura 11/13/12 – 12/12/12
10. Journal of the American Medical Association (JAMA): Effects of Fructose vs Glucose on Regional Cerebral Blood Flow in Brain Regions Involved With Appetite and Reward Pathways: by Kathleen A. Page, MD; Owen Chan, PhD; Jagriti Arora, MS; Renata Belfort-DeAguiar, MD, PhD; James Dzuira, PhD; Brian Roehmholdt, MD, PhD; Gary W. Cline, PhD; Sarita Naik, MD; Rajita Sinha, PhD; R. Todd Constable, PhD; Robert S. Sherwin, MD 12/18/12 – 1/16/13
11. Journal of Applied Physiology, Nutrition, and Metabolism: Consumption of sucrose and high-fructose corn syrup does not increase liver fat or ectopic fat deposition in muscles: by Stephen Bravo, Joshua Lowndes, Stephanie Sinnott, Zhiping Yu, James Rippe 1/28/13 – 2/26/13

News Outlets

Because the debates over HFCS and other nutritive sweeteners are wide-ranging, and products containing these substances are consumed by virtually every American, we wanted to examine a wide range of media outlets to assess the information available to consumers. Using the Lexis/Nexis and Factiva databases, we identified 120 media outlets that served different audiences. There were major papers and wire services like the *Associated Press*, *New York Times*, *Wall Street Journal* and *Washington Post*, as well as important regional papers like the *Atlanta Journal Constitution*, *Boston Globe*, *Chicago Tribune* and *Miami Herald*. We also selected some smaller papers around the country, like the *Bismarck Tribune*, *Omaha World Herald* and *Dayton Daily News*.

We were also able to explore how an array of magazines covered HFCS and sweeteners. We included magazines like *Time* and *Newsweek* as well as *the New Yorker* and *Atlantic* in our analysis. Since HFCS is common in many foods, we examined coverage in women's magazines like *Redbook*, *Good Housekeeping* and *Allure*, as well as similar magazines aimed at a male audience like *GQ*, *Men's Health* and *Esquire*. Our

initial sampling included broad-based food and health publications like *Bon Appetit* and *Prevention*.

Our sample of electronic media included programming from the three broadcast networks (ABC, CBS and NBC) as well as CNN, FOX, MSNBC, NPR and the PBS *NewsHour*. In addition, it is not possible in a retrospective study such as this one to examine coverage from the myriad websites that might have discussed HFCS. In lieu of that we included in our analysis the popular sites *BuzzFeed* and *Huffington Post*. However, the search functions on both sites are very limited, and we conducted multiple searches with various search terms to obtain the most complete sample possible.

Our database searches used a search string that identified stories mentioning corn syrup, sugar, or sweeteners as they related to our food or diet. For most time periods this search resulted in 800 to 1000 hits. To insure that our sample was consistent, we culled from this initial group all stories that: addressed sugar and HFCS pricing or business moves within various producing companies; recipes that included a passing mention of sweeteners; and any other stories that did not have at least one sentence addressing a health concern linked to sugar or HFCS.