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#### Title

Sugarcoating the Truth: The Sugar Association's Impact on Obesity

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## Abstract

America is currently struggling through an obesity epidemic and shows no signs of stopping. Over half of the population is not only considered overweight but obese. Obesity results from an imbalance between calories exerted, i.e. through exercise, vs calories ingested, i.e. through food. While many point the blame at the individual level and argue that a lack of exercise and an unhealthy diet have contributed to the rise of this disease, graphs depicting the trends of the onset of obesity over the past few decades suggest otherwise. Much larger, societal-level factors must have played a role given the sheer number of Americans affected across all ages, socioeconomic statuses, gender, and race. This paper explores the effects of the sugar industry's strategically misleading advertising campaigns as well as the role of high fructose corn syrup on consumers' diets. Understanding the history of the sugar industry and how it has evolved into one of the most powerful corporations in America with the government wrapped around its finger can help explain the concerning trends present today.

*Keywords: food politics, politics of diet, misleading advertising, sugar industry, high fructose corn syrup, misinformation, obesity, public health* 

#### Introduction



A list of the many different names for sugar found in the ingredients list of processed foods

Look at the ingredients of nearly any food item in a grocery store and you'll find the strangest names: fructose, cane sugar, dextrose, rice syrup, barley malt, just to name a few. Surprisingly, all these seemingly different words correspond to the same thing: sugar. <u>74% of packaged foods</u> have added sugar hiding behind the almost 60 various names in the ingredients list.

How are we supposed to make sense of these names, especially ones that may sound healthy, like "organic cane sugar" or "brown rice syrup," when they really all represent sugar? Reading an article for my public health class on the <u>secret behind sugar in our diets</u> got me thinking of a possible answer. The article discusses how the Sugar Association purposely hid countless research articles highlighting a link between sugar and its harmful health effects from the public for the sake of maintaining their profits. The sugar industry as a whole has "deeply penetrated science in order to distort the facts about what's good for our health" (Kavanaugh, 2019). As more research has come out underscoring the profound impact added sugar has on increasing the risk of obesity, diabetes, and many other serious chronic conditions, the sugar industry must be scrambling to find ways to inject their products into Americans' diets without catching anyone's attention.

It surprised me how much the sugar industry could affect our daily consumption of sugar without us realizing. Researching more about the sugar industry's actions and the role of sugar in our diets uncovered a shocking trend: processed sugar has really only been introduced into our diets in the last few decades. In that same time period, the prevalence of obesity has drastically risen, so much so that it is now considered an epidemic in America. Understanding the history of the sugar industry and how sugar affects our health might lead to some explanation of this concerning correlation.

#### The Real Truth: Today's Statistics

America has the <u>highest proportion of people who are obese</u>. The term obesity is defined as having a body mass index (BMI), which is determined by a person's weight divided by their height, over 30. High BMIs result from an energy imbalance in which calories entering the body exceed those expended. Such a caloric imbalance can be attributed to many behavioral and environmental factors like culture of lifestyle and marketing of highly caloric foods. Understanding obesity is so crucial because of its profound negative impacts on health. Obesity is linked to an increased risk of hypertension, Type II diabetes, coronary artery disease, and congestive heart failure, as well as several cancers.

Why is America experiencing such significant rates of obesity that it is now considered an epidemic? Obesity results from a caloric imbalance, so the blame lies in the increased caloric intake seen in the US over the past few decades, due to increased portion sizes and the significant rise in carbohydrate intake. The lack of legislation to restrict portion sizes of meals at restaurants and regulation of people's access to ultra-processed foods has led to this massive caloric increase. Additionally, the societal shift of moving toward less physically

demanding jobs and longer working hours has driven a preference for convenience of food rather than health. This change has led to eating <u>300-500 more calories per day</u> and not meeting the necessary calorie deficit to avoid obesity. The overabundance of food in the US forces companies within the food industry to compete against one another and subject consumers to personal preference of food instead of simply the minimum amount needed to stay alive and nourished. This competition results in major marketing campaigns by the food industry that further leads to an overconsumption of processed foods, exacerbating the onset of obesity. In 2000 alone, <u>537.8 billion dollars funded marketing costs for domestic farm food</u>. This advertising expenditure increased 258% from just the 1970's to the 2000's.

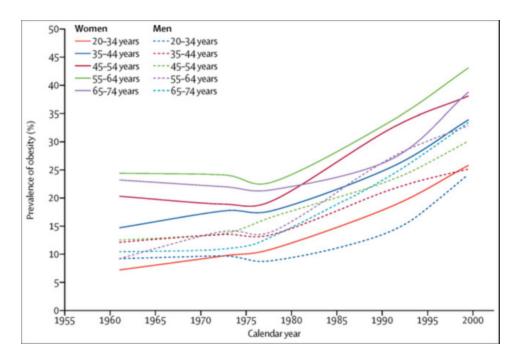
Marion Nestle, an esteemed professor of nutrition, food studies, and public health at New York University, wrote a book titled <u>Food Politics</u> that discusses the marketing strategies of the food industry. Food and food service companies spend more than 11 billion dollars annually to target and manipulate consumers. 70% of these funds go to advertising for specifically desserts, processed foods, candy, snacks, and convenience foods, while merely 2.2% fund marketing for fruits, vegetables, and grains. The following pictures show this stark discrepancy. To the left is the normal food pyramid with the recommended servings for each food group; the right image highlights actual proportions of each food group in terms of marketing, with the fats, oils, and sweets group at the top taking a much larger portion, and the fruits and vegetable groups represented on a disproportionately smaller scale. Understanding this unequal distribution of marketing dollars explains the high caloric intake we see among Americans today since the majority of the marketing dollars go mainly to the highly processed foods.



Food pyramid with recommended serving sizes for each food group



Redrawn food pyramid with the proportions of marketing dollars going to each food group



Graph depicting the significant rise in prevalence of obesity across all age groups starting a little after 1975

With these unregulated strategies put in place to convince unknowing consumers what to eat, the shocking trends visible today begin to make more sense. Specifically among children ages 6-11, the prevalence of obesity has risen 114% from the 1970s to 2000s, and studies have shown an increase in likelihood of heart disease and stroke before the age of 30 — yes 30 — among obese children. Epidemiological studies indicate a 34% prevalence of obesity among adults and a 15-20% prevalence among children, equating to a little more than 50%, or the majority, of the US population. Perhaps the most intriguing statistic is the following graph depicting the rise in prevalence of obesity 1960 to 2000. From 1960 to about 1975, the prevalence among each sex and age group remains relatively consistent. After 1975, however, obesity sharply increased across the board. Because such a significant trend is observed across both sexes and all five age groups, a mere deterioration in diet and/or exercise simply cannot explain this graph. Genetic predispositions could also not be a reason since these trends cannot occur in just a few short years to cause such significant change across all groups simultaneously. Thus, the cause must lie in some rapid, populationwide change. Something must have happened in the early 1970's to explain the dire obesity epidemic America is struggling with today.

#### The Real Truth: What Happened in the 1970's

The significant increase in obesity rates across all genders and ages starting from the 1970's begs the question: what happened in the 1970's to get us to this point? The food environment, the social and physical context around which Americans consumed food, completely changed. Prior to 1970, the post-Depression era along with the World War II price-support programs and import tariffs resulted in <u>high domestic sugar prices</u> leading to a very undesirable economy; on top of this, the country was in a crisis after the Vietnam War.

Evidently the president at the time, President Nixon, faced a substantial amount of heat from voters so he appointed Earl Butz as the USDA Secretary of Agriculture in 1971 to address the rising food prices.

As USDA secretary, Butz's main goal was to drive down food prices; his motto was "get big or get out" (BBC Documentary The Men Who Made Us Fat). He accomplished this by subsidizing farmers as an incentive to plant as much food as possible. With a higher production, the prices of food considerably lowered. While this feat may have been music to President Nixon's ears, the excess food, primarily corn, set the stage for both the development of high fructose corn syrup and the massive increase in food industry advertising.

The sudden rise in consumption of high fructose corn syrup (a per capita increase of 1000%) between 1970 and 1990) comes as no surprise when considering its utility and economic efficiency. In 1971, a Japanese scientist named Yoshiyuki Takasaki first patented high fructose corn syrup. He developed a method to artificially manipulate corn to create a sugary syrup. Butz took advantage of how this product utilizes corn to cheaply produce sugar and introduced it to the United States. Because of high fructose corn syrup, farmers essentially considered corn as gold as they were able to efficiently turn the large surplus into a domestically produced form of sugar that was cheaper than the price of sugar at the time. The CDC did not start mapping out rates of obesity until 1985, so no one really understood any possible link between high fructose corn syrup and obesity. Thus in the 1970's, high fructose corn syrup ran rampant. Because of its cheaper production as compared to regular sugar, food manufacturers injected it into everything, especially soft drinks. In fact, an article was published in 1983 about Coca Cola's use of high fructose corn syrup in further sweetening their drinks at an even cheaper price; this allowed them to provide even larger portions to consumers. Coca Cola's actions allowed them to pocket 70 million more dollars that year while at the same time vastly increasing the consumption of soft drinks, all of which contained concerning amounts of high fructose corn syrup.

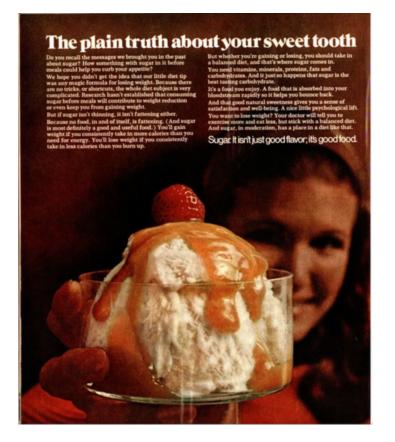
Given the process of high fructose corn syrup, where glucose is artificially converted to fructose to produce a sweet syrup, one would hardly consider such a product "natural." Yet at the time of its introduction into the American food industry in the 1970's, the Food and Drug Administration (FDA) never established what "natural" meant. This loophole led to major companies freely labeling their products as such since they believed this product derived from corn indicated it was "natural" when that was obviously not the case.

But companies, primarily the Sugar Association, did not stop there in terms of falsely advertising to the public. Followers of the shareholder value movement demanded more immediate returns on investment so food companies already competing in a market with overabundant products (thank you Earl Butz!) needed to find ways to make even more of a continual profit to keep stock prices high. Their response? Create new products or trends consumers did not know they needed. Like, for example, eating snacks in between meals as a "diet aid." Prior to the 1970's, a large stigma existed against eating between meals, but the

food industry persisted in convincing consumers they needed to eat their sugary snacks in between meals to help curb their appetite. This trend vastly increased Americans' overall intake of sugar, specifically high fructose corn syrup, and calories, leading to obesity. Because of sugar's addictive quality, consumers kept coming back for more, playing right into the hands of these food companies.



Sugar Association's ad in LIFE magazine ad in 1970 recommending consumers to eat a cookie before lunch Sugar Association's ad in LIFE magazine ad in 1970 recommending consumers to eat sugar to address the "fat time of day"



Sugar Association's ad from a 1973 issue of TIME Magazine to try to retract their previous claims on sugar

The Sugar Association continued to make claims in the 1970's in addition to treating sugar as a diet aid. They went on to say that their products actually regulate appetite by suppressing it with the consumption of sugar and claiming that <u>drinking soda actually does</u> <u>not cause children to get fat</u>. These headlines became so misleading that the Federal Trade Commission (FTC) had to step in to stop these advertisements. Initially, the Sugar Association responded by defending the validity of their health claims. But after further pushback from the FTC, the Sugar Association agreed to invest money in advertisements in 1972 to clarify their previous claims. Great! The Sugar Association recognized their fault in misleading millions of consumers and strove to change it! Not quite. Let's take a closer look at the advertisement they published to supposedly rectify their actions.

They write, "We hope you didn't get the idea that our little diet tip was any magic formula for losing weight. Because there are no tricks, or shortcuts, the whole diet subject is very complicated." That's interesting. Didn't their previous ads say that simply eating their products throughout the day would curb their appetite and help them lose weight? They further go on to write, "But if sugar isn't thinning, it isn't fattening either." As any consumer reading this advertisement, what are you supposed to make of that? Is sugar bad? Is sugar good? Does it help you lose weight? To add to this confusion, the advertisement ends with "Sugar. It isn't just good flavor; it's good food." That, too, with a brightly colored, enticing, gooey caramel ice cream sundae. How can one resist? The confusion resulting from this ad seems almost purposeful; consumers reading these claims already have their favorite foods or eating routines established (most likely thanks to previous Sugar Association ads), so

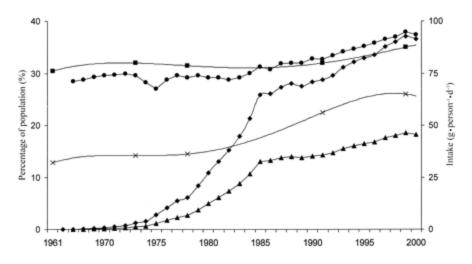
these confusing advertisements do little to convince consumers of the harms of sugar. All this advertisement really accomplishes is confusing consumers and marketing their own product.

Evidently, the claims food industries presented to consumers added on to the increased consumption of high fructose corn syrup kickstarted by Earl Butz. Understanding the double whammy of injecting high fructose corn syrup into everything and manipulatively advertising to keep consuming high fructose corn syrup, the puzzle pieces begin to come together to understand how the obesity epidemic we face today stems from just a few decades prior.

#### The Real Truth: the Link Between Sugar and Obesity

Consumption of high fructose corn syrup increased more than 1000% between the time Earl Butz introduced it to the US in 1970 and 1990. That is just 2 decades. Furthermore, high fructose corn syrup represents more than 40% of caloric sweeteners added to food and beverages and serves as the sole caloric sweetener in soft drinks in the US. This unregulated massive spread of the sickly sweet syrup is especially concerning given its negative effect on humans' appetite. Glucose, the molecule present in normal sugar from cane stalks for example, signals satiety because its presence triggers the release of insulin which then triggers the release of leptin, a hormone that suppresses appetite. Fructose, the molecule to which the natural glucose in corn is converted in the production of high fructose corn syrup, however, does not release a signal to the brain and so does not trigger insulin release. This in turn means leptin levels in the body are much lower. Low leptin, the appetite suppressing hormone, means less satiety and a larger appetite.

The BBC Documentary titled The Men Who Made Us Fat explores the role the sugar industry and the government played in America's obesity epidemic and interviewed Dr. Jean-Marc Schwarz, a food scientist at San Francisco's General Hospital. He describes the role of leptin in making the brain think the body is starving as a vicious cycle of consumption, addiction, and disease. Neurologists even call the effect of highly processed foods containing high fructose corn syrup a "hedonic response," a momentary bliss that takes over the brain. The pleasure derived from these foods can be overpowering. Highly hedonic foods take over our brains, so much so that the receptors triggered by consumption of these foods become wired to the emotional part of the brain so that the learning, memory, and habit neural circuits are activated. These circuits are the same as those activated during addiction. Thus, low leptin levels have been shown to be <u>associated with obesity and weight gain</u>. Supporting this relationship, studies on humans lacking the gene that encodes for leptin are <u>massively obese</u>.



Estimated intakes of high-fructose corn syrup (HFCS,  $\blacklozenge$ ) in a positive correlation with the prevalence of obesity (x) in the United States.

The impact of high fructose corn syrup on the onset of obesity is especially concerning given the amount of access children have to the various syrup-sweetened soft drinks. These sweetened beverages are highly caloric, leading to caloric overconsumption, which serves as the basis for developing obesity.



1989 study found that fondness of sweets and withholding dessert were factors not related to the development of childhood obesity

Yet surprisingly, a longitudinal study conducted in 1989 at the University of California, Berkeley researching the development of obesity in children found no relationship between "fondness of sweets" and childhood obesity. Through more extensive research and knowledge about the effect of sugar on the human body, however, another longitudinal study of more than 500 school children studied for more than a year found that for every additional serving of sugar-sweetened beverage consumed, the BMI and frequency of obesity increased after adjusting for confounding variables. Knowing that sugar-sweetened beverages' sole source of sweetness derives from high fructose corn syrup, it is shocking to witness how easily children can access soft drinks at such a young age. Obesity trends among children are on the rise. This trend does not bode well for the health of our future and increasing healthcare costs that could otherwise be avoidable if the food and drink industry did not actively force their sugar-laden products onto children.

#### The Real Truth: the Ethics of the Sugar Industry

Despite knowing the harmful effects and addictive quality high fructose corn syrup poses for American consumers, especially children, how can an entire food industry simply turn a blind eye? Do they really prioritize profit over public health? Here lies a prime example of an

ethical dilemma, defined as a situation in which the actions of one group harms another. Noting the trends of rising obesity among Americans in correlation with the increasing marketing strategies performed by the food industry to push for high fructose corn syrup consumption, it seems obvious which group is harmed and which group is not. The food industry frames its tactics to promote freedom and individual will when really their true objective is "trade and unrestricted profit" (Nestle, 2013). Yet simply banning certain foods from Americans' diets would hurt the thousands of jobs and companies that profit off of those very products. Similarly, having the government mandate certain foods for the sake of the consumers' health proves an ethical dilemma within a free market economy. While organizations like the Kaiser Family Foundation have recommended a ban on junk food advertising to children and limitations on snack foods and soft drinks sold in schools, these campaigns to limit advertising have been unsuccessful (Sharpe, 2010). Is it really a question why such bans have not been implemented? The complexity in food regulation blurs the line between what can and cannot be done to address this issue.

The sugar industry, however, has frequently crossed the line as they blatantly lie to consumers, both with false or biased claims, and hide evidence that their products negatively affect our health. They claim "every scientific review of evidence has concluded that sugar in itself is not linked to any lifestyle disease" (BBC Documentary The Men Who Made Us Fat). This idea is so ludicrous, even John Oliver, a late-night comedian, felt the need to include what the Sugar Association's CEO said about sugar in his monologue as a source of comedy for his audience.



Click above to watch John Oliver's takedown of the sugar industry (4:19 - 5:12)

In fact, our very own University of California, Berkeley received the spotlight in Nestle's book for allowing the private sector to make research decisions. In 1997, the Department of Plant and Microbial Biology at UC Berkeley formed a public-private partnership with Novartis, a Swiss agriculture and drug company, for enhancing research for public interest. In this partnership, UC Berkeley permitted the industry partner to select the participating faculty and place a full-time scientist of its own on the faculty, to name a few. This partnership clearly raised many concerns regarding the validity and unbiased nature of the research conducted by UC Berkeley with Novartis funding. While such an example might seem rare, a 1996 survey reported that more than 30% of universities accepted industry funding. How are consumers expected to listen to the science when that very science has hidden ulterior motives to prioritize profit over anything else?

In the same vein, numerous food companies have funded specific research articles that directly support their products. The following table from Nestle's Food Politics highlights just a few examples. Such partnerships imply that the research was essentially bought and then used as a publicity stunt to market their products. This scheme is not unbiased science. It is the corrupt misleading of millions of unknowing Americans.

TABLE 14. Quotations from selected research studies, reviews, or editorials supported fully or in part by food, beverage, or supplement companies

"High-fibre breakfast cereals may help to reduce risk of cancers that are associated with poor fibre intakes." (The author is employed by Kellogg's, UK.)<sup>a</sup>

"Eating two eggs daily for 12 weeks . . . resulted in no statistically measurable effect on plasma LDL-C [low density lipoprotein-cholesterol, the "bad" kind] in HC [high-blood-cholesterol] subjects" (funded in part by The Egg Nutrition Center).<sup>b</sup>

"Margarine intake compared with butter intake lowered LDL-C levels 11% in adults...and 9% in children." (Sponsors included the United Soybean Board and the National Association of Margarine Manufacturers.)<sup>c</sup>

"The prepared meal plan is a simple and effective strategy for improving dietary compliance and CVD [cardiovascular disease] endpoints." (This study was funded by Campbell Soup, maker of the prepared meals.)<sup>d</sup>

"Scientific findings indicate that the prevalence of lactose intolerance is grossly overestimated." (One of the authors is an officer of the National Dairy Council. Lactose is the principal sugar in dairy products.)<sup>e</sup>

- "Zinc gluconate . . . significantly reduced the duration of symptoms of the common cold by 40% compared with placebo." (One of the authors is reported to have earned nearly \$145,000 from sale of the product's stock before the paper was published. A later study by the same group found zinc to be ineffective against colds.)<sup>f</sup>
- "Substantial evidence indicates that intakes greater than the recommended dietary allowances (RDAs) of . . . calcium, folic acid, vitamin E, selenium, and chromium reduce the risk of certain diseases for some people." (The author of the review is a scientist/official of the Council for Responsible Nutrition, a supplement-industry trade association.)<sup>g</sup>

List of examples of research funded by the company that directly benefits from the research claims



Fat free chocolate milk often given at schools that still has 20g of sugar per carton Not only has the food industry, especially the sugar industry, made false or biased claims to the public, but it has also tried to cover up scientific reports or dietary guidelines encouraging a reduction of sugar in our diets. The Men Who Made Us Fat analyzes the industry's actions at length. In the 1950's, before obesity was on anyone's radar, America focused on the concerning prevalence of heart disease. Ancel Keys, an American physiologist who studied the effect of diet on health, proposed that since sugar offered energy, it could not be harmful. Thus, the threat to American's hearts must have been due to fat. It is important to note that he stated this without actually conducting any studies to support him, but rather made the claim, then spent the next few decades trying to prove himself right. Of course, the damage was already done, and the food industry immediately took advantage of this idea of "less fat." In the industry's eyes, a new gap in the already very competitive market opened up: "low fat" and "heart healthy" products, claims we still see even today. While these products may sound healthier, these companies really just took out the fat from their products and substituted it with, you guessed it, more sugar. These products were low in fat, but very high in calories to make them more appealing to consumers. No one wants to drink plain skim milk, but when you dump in exorbitant amounts of sugar and make it a chocolate drink, you can barely taste the difference!



The cover of the children's book written by Cruz Gomez to educate children on sugar regulation

John Yudkin, a prominent nutritionist in the 1970's, questioned Ancel Keys' claim that fat was the sole cause for disease and instead blamed sugar since that was the only food most recently introduced into the world's diet to cause such a significant change. The sugar industry, out of fear of losing customers, lobbied against him, discrediting him by numerous societies. Their efforts were so effective that sugar was not further addressed as an issue and continued to roam free, infiltrating everyone's diets and adding to the risk of obesity.

With so many breaches of ethics and corrupt partnerships, it may be natural to question why the government never got involved to stop the Sugar Association's efforts in forcing their sugary products onto consumers. It turns out the Sugar Association holds a strong influence on actions taken by the government. The World Health Organization (WHO) was about to publish a report that would set global limits on the amount of sugar in our diets as more and more evidence proved the harmful effects of sugar on our health. Observing the pattern thus far, you can guess how the sugar industry reacted. The Sugar Association wrote to the WHO's director general, threatening to withhold 46 million dollars of US funding. The US Health Secretary even flew to Geneva, the headquarters of WHO, to advocate for the sugar industry in person. As a result of these drastic efforts, the WHO never published the report. How can one organization have so much power within the US government to prevent the publication of a report that could improve the health of billions around the world? How can one organization care so much about the money in their pockets instead of the food in people's stomachs? How can one organization play such a large influence in an obesity epidemic that does not show signs of slowing down?

Despite the scale and gravity of this issue, some are trying to find and implement solutions to combat obesity. As early as the 1980s, Cruz Gomez, an activist and employee for Food and Nutrition Services, Inc., published a <u>children's book warning children of the harms of sugar</u>. This public health approach saves lives and money since it aims to educate children at an early age to prevent more serious health outcomes in the long-run by teaching how to curb their sugar appetite.

Hank Cardello, a former Coca Cola executive, quit his job and started a consulting firm to hold corporations accountable for their role in obesity prevalence. He even published a book titled Stuffed: An Insider's Look at Who's (Really) Making America Fat. He discusses the impacts of food company practices, inadequate government regulations, and misleading media coverage on today's obesity epidemic. Both of these examples show the importance of education on an individual level to address sugar's role in obesity. Marion Nestle also stresses a nationwide solution by means of societal changes to restrict lobbying and marketing practices of food industries. She offers ideas such as restricting media time to have less junk food ads and more "eat less, move more" campaigns, enforcing health care training to require nutrition counseling, or enforcing members of regulatory agencies to insist on full disclosure of conflicts of interest of members of advisory boards. Little by little as awareness increases and agencies advocate for government-level solutions that directly address the marketing and regulation of food industries, America can hopefully see the light at the end of this obesity tunnel.

#### Conclusion

Evidently the sugar industry has played a major role in today's obesity epidemic. Not only did they initially convince consumers to snack on as many sugary foods as possible in between meals, but they also actively worked to downplay research articles highlighting the harm of excessive sugar, prevent the publication of official dietary reports advocating for a decreased sugar consumption, and silence nutritionists studying the link between sugar and obesity. Even the government, whose role is to act as an unbiased party serving its citizens, influenced rising trends of obesity with its introduction of high fructose corn syrup into the market and working hand-in-hand with the food industry to help maximize their profits. It is truly incredible the amount of power the food industry, especially the Sugar Association, holds in influencing consumers' decisions while still doing so in such a subtle and sly manner. Consumers either don't know what to believe in terms of what is healthy or not, or continue purchasing sugary items under the guise of terms like "organic cane sugar" or even "low fat."

As you go on your next grocery run, check the ingredients of the foods you buy. Don't let the Sugar Association take advantage of you like it has for millions of Americans over the past nearly half a century.

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