

# “Big Sugar” and metabolic syndrome, killers of millions annually worldwide

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As reported in a WSWs article last November, the Public Library of Science (PLOS) has published a major exposé of the sugar industry’s “manipulation of science” for its “commercial advantage.” This involved the suppression of findings and defunding of projects that were adding to a growing body of evidence in the 1950s and 1960s about the role of sugar consumption in the causation of coronary heart disease (CHD) and bladder cancer.

Internal documents dating from 1965, reviewed by Cristin E. Kearns, Dorie Apollonio, and Stanton A. Glantz, revealed that the Sugar Research Foundation (SRF) secretly funded research in the United Kingdom that demonstrated that sugar (or sucrose, composed of one molecule of fructose and one molecule of glucose) in rats significantly raised triglyceride lipids linked to heart disease and heart attacks. The study also demonstrated the association of sucrose consumption with elevated levels of urinary beta-glucuronidase, an enzyme previously linked to human bladder cancers.

After the SRF examined the preliminary findings that were very likely to become commercially disadvantageous, the industry cut off funding for the completion and confirmation of the first results at Birmingham University. The findings were never published and were buried for subsequent decades until the recent unearthing of industry documents.

In November 2016, the *Journal of the American Medical Association* Internal Medicine division (JAMA/IM) published a Special Communication titled, “Sugar Industry and Coronary Heart Disease Research, A Historical Analysis of Internal Industry Documents” by Kearns, Laura A. Schmidt, and Glantz. Previously, Dr. Glantz was involved in the exposure of the tobacco industry’s decades-long disinformation campaign to conceal the human toll from cancer and heart disease wrought by cigarette smoking.

World Cat, a global catalogue of library collections, was used to search for documents of the aforementioned refined sugar trade group SRF, subsequently changed to the Sugar Association (SA), as well as documents of the National Academy of Sciences (NAS), the National Research Council, the US Public Health Service, American Heart Association (AHA), and the American Medical Association, among others.

The JAMA/IM investigators also found documents from the 1950s and 1960s archived at Harvard University and the University of Illinois, and other academic institutions, exhuming communications between nervous post-World War II sugar industry executives and academics regarding the findings that had already emerged in Europe and in North America as to the probable role of sucrose in the causation of CHD and heart attacks, which today retains first place in human mortality.

Prior to World War II and well into the 1950s, health authorities and nutrition scientists worldwide insisted that the rising consumption of refined sugars, along with starch and refined carbohydrates such as potatoes, rice and breads, contributed significantly to human obesity. Increasingly, European and American researchers began connecting CHD,

diabetes, and strokes to heavy sugar consumption, which was on the rise with the postwar soft drink, snack and confectionery industries.

## The campaign to exonerate sugar

In a strategic move to protect and increase market share and to counter the emerging scientific evidence unfavorable to sucrose consumption, Big Sugar launched a campaign in 1954 to dispute the adverse scientific findings and resulting publicity.

The main target was John Yudkin, professor of nutrition at Queen Elizabeth College, University of London, who later, in 1972, published a review of his research group’s studies titled *Pure, White And Deadly, How Sugar Is Killing Us And What We Can Do to Stop It*.

Yudkin demonstrated that the worldwide rise in the incidence of heart disease tracked very closely the rise of refined sugar consumption globally. Similar associations of sucrose consumption and heart attack rates were published by “the Iowa (US) group,” Alfredo Lopez, Robert Hodges and Willard Krehl. Articles appeared in the *Annals of Internal Medicine* in June 1965 linking sugar to CHD, reporting population studies that strongly suggested blood glucose levels were superior predictors for future heart attacks than serum cholesterol and high blood pressure. Another article suggested provocatively (as far as the sugar monopolies were concerned) that “perhaps fructose, a constituent of sugar ... was the agent mainly responsible (for heart disease).” An editorial appearing at the same time remarked, “sucrose must be atherogenic (causative of hardening and thickening of arteries).”

On July 11, 1965, the *New York Herald Tribune* ran a full-page article about the *Annals of Internal Medicine* findings, concluding that new research strengthened the argument that sucrose was responsible for the rise in heart attacks.

## Enlisting Harvard and the FDA

Investigators’ examination of the archived documents show that the sugar industry enlisted Fredrick Stare, chair of Harvard University’s School of Public Health Nutrition Department, to join the Sugar Advisory Board (SAB) that year. Stare had solicited funds from the food industries for his department since 1943 and consulted for the NAS, the National Heart Institute and the AHA. The SA and its vice-president John Hickson launched Project 226 and hired Stare and two other researchers at Harvard, D. Mark Hegsted and Robert McGandy, to author a series of articles favorable to Big Sugar.

The researchers were paid \$6,500 (\$48,900 in 2016 dollars) for the eventual appearance in July and August, 1967 of two articles in the prestigious *New England Journal of Medicine* (NEJM) that effectively shifted the blame for CHD from sucrose consumption to the ingestion of saturated fats. The payment by Big Sugar for the findings was not disclosed at the time of the NEJM publication.

Stare's department at Harvard had broken ground in 1960 on a \$5 million new building with donations from General Foods, maker of Kool-Aid and Tang. In the early 1970s, the SA ranked him amongst its most reliable academic allies, while his department collected funds from Coca-Cola, Gerber, Kellogg and Carnation.

The 1967 NEJM articles declared there was "no doubt" that the only dietary intervention required to arrest the rising onslaught of heart attacks and to prevent CHD was to reduce dietary cholesterol and substitute polyunsaturated fat for saturated fat in the American diet.

In the fall 2016 publication of the JAMA/IM investigation, Marion Nestle, professor of nutrition, food studies and public health at New York University, commented in an accompanying editorial that the documents provided "compelling evidence (that Big Sugar had initiated research) expressly to exonerate sugar as a major risk factor for coronary heart disease. I think it's appalling."

According to a *Mother Jones* article in November, 2012, the SA went on to establish its Food and Nutrition Advisory Council in the 1970s, funding it with \$60,000 a year, and comprised of six physicians and two dentists who agreed to defend sugar's place in a healthy diet. The group wrote an 88-page paper titled "Sugar in the Diet of Man," which the SA printed 25,000 copies of to be distributed to mass media outlets nationwide. The accompanying press release prominently declared, "Scientists dispel sugar fears."

The SA concocted plans for the broadcast of three-minute radio spots by Stare extolling sugar's virtues by hundreds of radio stations, until he was exposed in 1976 by the Center for Science in the Public Interest in an article titled "Professors on the Take."

Big Sugar cast Stare aside and moved on to the Food and Drug Administration (FDA), which formed a committee to vet the safety of processed food substances and additives, or what was termed "generally regarded as safe (GRAS)." Sufficient numbers of the committee were advocates for Big Sugar to yield industry-favorable decisions by the FDA. The GRAS committee ran into trouble briefly from the USDA's Carbohydrate Nutrition Laboratory, which reported "abundant evidence that sucrose is one of the dietary factors responsible for obesity, diabetes and heart disease." But the committee's sugar section won out, reporting in January 1976 that, while sugar might cause tooth decay, it was not a "hazard to the public," and dismissing the link to diabetes and heart disease as "less than clear" and "circumstantial."

The SA immediately blasted the American media with headlined ads, "Sugar is Safe!", explaining it "does not cause death-dealing diseases ... there is no substantiated scientific evidence indicating that sugar causes diabetes, heart disease or any other malady," and accusing all opposition of being either "discredited" Yudkin followers or liars.

At the University of Minnesota, Ancel Keys, a nutritionist who had accepted funds from Big Sugar since the early 1940s, stepped forward in the 1960s and 1970s as the chief US proponent of the hypothesis of fat as the primary driver of CHD. The SA also recruited Edwin Bierman of the University of Washington as its top diabetes expert, who insisted that diabetics did not need to pay seriously strict attention to sugar intake, and who joined Keys in declaring that dietary fat caused heart disease.

All of this drove federal health and nutrition guidelines policy regards sucrose safety for the ensuing decades.

In 1980, per-person sugar consumption in the US stood at 120 lbs annually, and by 2010 had seen an increase to 132 lbs. The percent of adults termed obese in 1980 was 15 percent, and by 2010 it had risen to

35.7 percent. The percent of obese children in 1980 stood at 5.5 percent, and by 2010 it had tripled to 16.9 percent, in large measure because of the soft drink industry. The percentage of Americans with diabetes in 1980 was 2.5 percent, which tripled by 2010 to 6.8 percent. So-called adult onset diabetes was diagnosed for the first time in adolescents and children.

## Metabolic syndrome

Despite the SA and soft drink makers buying findings at major institutions, the tide of scientific facts has been relentless, given the burden of disease linked to sugar consumption and the emergence of metabolic syndrome (MS), an umbrella term referring to the hormonal and biologic dysfunction in a human being consuming excessive amounts of sugar and its chemical relative, high fructose corn syrup. The human being's digestive systems treat the two compounds identically, and it is apparently the fructose portion of sucrose and high fructose corn syrup that uniquely affects humans.

Metabolic syndrome includes an obesity that involves "visceral" fat deposition, most prominently around the waistline, fat which is also infiltrating internal organs, especially the liver, rising blood pressure, heart disease, diabetes, elevations in triglycerides, and so-called insulin resistance. Insulin resistance refers to the human being's cells becoming insensitive to insulin's vital regulation of blood sugar. The blood sugar then keeps rising, and the pancreas keeps pouring out more and more insulin, which in turn provokes more eating and more weight gain, and further ramps up blood pressure.

Varman Samuel, who studies diabetes and insulin resistance at the Yale School of Medicine, told the *New York Times Magazine* in 2011 that "when you deposit fat in the liver, that's when you become insulin-resistant." As Gary Taubes put it for *New York Times Magazine*, the body's cells begin ignoring insulin, even to the point of pancreatic exhaustion of insulin manufacture, which is when blood sugar control is lost completely.

The Centers for Disease Control and Prevention estimated in 2012 that 75 million Americans have metabolic syndrome, and that for heart attack victims, more likely than not, MS is the root cause. An estimated 100,000 Americans are dying with complications of MS a year. MS has also been linked to declining cognitive function, where brain cells "ignore" insulin, and neurons degenerate for lack of glucose derived energy.

Another *New York Times Magazine* article in 2002, again by Taubes, and headlined, "What If It's All Been A Big Fat Lie?," observed that "calorie for calorie, (processed starches and refined carbohydrates) are the cheapest nutrients for the food industry to produce, and they can be sold at the highest profit."

Metabolic syndrome has also become associated with the rise in global cancer rates, according a 2007 report by the World Cancer Research Fund and the American Institute for Cancer Research, titled "Food, Nutrition, Physical Activity and the Prevention of Cancer." Researchers at Memorial Sloan-Kettering Cancer Center in New York told Taubes that the effects of insulin resistance spur the output of more insulin and at least another insulin-like hormone that promotes tumor growth, and also that pre-malignant cells utilize the elevated insulin growth factors to mutate in the setting of MS, obesity, and diabetes. Craig Thompson at Sloan-Kettering told Taubes that he believes numerous pre-cancer cells would never undergo life-threatening changes without the hyper-insulin levels and related growth factors driven by MS.

Thompson and Lewis Cantley at the Cancer Center at Beth Israel Deaconess Medical Center at Harvard Medical School make the case that if sugar is causing insulin resistance, it is difficult to avoid the conclusion

that sugar causes cancer, in at least some cases. Cantley leads a scientific team working on a specific insulin-signaling gene, PI3K, that is said to drive breast and some other women's tumors. On a personal note, they both explained that this is why they avoid eating sugar.

*Nature Magazine* published an article in February 2012, titled "The Toxic Truth About Sugar," by Robert Lustig, MD, Laura Schmidt and Claire Brindis. Lustig (a self-described Yudkin disciple) is professor of pediatric endocrinology at the University of California at San Francisco and author of *Fat Chance*, published in 2012, in which he describes MS as "the new scourge." The *Nature* article reported that CHD, diabetes and cancers claim 35 million lives annually worldwide, for the first time in history outstripping infectious disease as a killer.



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