

Sugar: A Cautionary Tale

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Few people appreciate the truly influential role that sugar and food sweeteners have played in food and drug regulatory history. A few historical snippets will make the point: Sugar was one of the earliest and remains one of the best food preservatives. Jams, jellies, and preserves, were critical for taking frontier families from summer harvest through the winter to next spring's "starving time," before the first harvest. It was an essential preservative in early industrializing America as well, in addition to being an essential raw ingredient in alcohol, which often constituted part of a workman's compensation. In addition to concerns about adulteration, quality and safety in the late nineteenth century, the manufacture of cheap candy became one of the earliest controversial women's labor issues in the U.S. After the Civil War, America's trade deficit was largely due to imported sugar. Harvey Wiley studied sugar chemistry in Germany and it was this expertise that won him the appointment in Washington as Chief Chemist in the Department of Agriculture, which was fully engaged in exploring domestic sugar sources. Sugar, therefore became the crucible upon which Harvey Wiley's governmental career first rose.

Assessments of the human health implications of sugar consumption, however, have a much murkier past. Historical and anecdotal evidence for pediatric populations is the clearest: Mothers' mantra of "no sweets before dinner," appears to be one of the most eternal and ubiquitous of modern pediatric rules. More serious allegations of adverse pediatric consequences, however, have not withstood scientific scrutiny. In 1988, the Surgeon General's Report on Nutrition and Health concluded that alleged links between sugar consumption and hyperactivity/attention deficit disorders in children had not been scientifically supported.



As for adults, it is clear that artificial sweeteners were one of the first regulated foods "for special dietary use." Physicians in the early twentieth century, had begun to recommend sugar restriction for some of their patients. A vague conviction that overweight, under exercise, diabetes, and

debilitation were somehow linked dietetically in their patients is nowhere as well documented as it is for Theodore Roosevelt, America's 26th president from 1901-1909. In his early career, as a "Rough Rider" in the Spanish American war, Roosevelt was the 19th century's embodiment of the physically active and robust outdoorsman -- a true rugged individualist. His skill as a hunter was well known as well. In 1902, while on a hunting expedition down the Mississippi River, Roosevelt failed to locate suitable prey. Members of his hunting party, as the story goes, not wishing the President to be disappointed, captured a bear cub and tied it to a nearby tree for his pleasure. Roosevelt, however, refused to consider shooting the cub and when the story was depicted in a *Washington Post* cartoon, it inspired creation of one of America's most beloved toys: the teddy bear. Apparently, however, by 1907, the President's desk job had taken its toll and the President's physician, in an effort to curb his growing corpulence, prescribed a diet devoid of sugar, replacing it with saccharin. In the context of early food and drug regulation, however, the rest of the story is well known.

Wiley's Fight Against Saccharin

Shortly after passage of the 1906 Act, James S. Sherman, future Vice President of the U.S., then representing Sherman Brothers, a food manufacturing firm in New York, was granted an audience with President Roosevelt to discuss a number of his firm's concerns, which included Wiley's opposition to his firm's use of saccharin in canned corn. Wiley viewed it as both an illegal substitution of a valuable ingredient (sugar) for a less valuable ingredient (saccharin) in canned corn, as well as a health issue, since he had concluded from the bureau's "poison squad" studies, that saccharin was deleterious to health. When Sherman raised the issue with the President, claiming his firm had saved \$4,000 the previous year by employing the substitute sweetener, Wiley did not wait to be cued into the conversation.

I did not wait for the President to ask the customary questions. I was entirely too precipitate in the matter. . . . I immediately said to the President: "Everyone who ate that sweet corn was deceived. He thought he was eating sugar, when in point of fact he was eating a coal tar product totally devoid of food value and extremely injurious to health."

Roosevelt's answer, Wiley rued, proved his undoing.

"You tell me that saccharin is injurious to health?" I said, "Yes, Mr. President, I do tell you that." He replied, "Dr. Rixey gives it to me every day." I answered, "Mr. President, he probably thinks you may be threatened with diabetes." To this he retorted, "Anybody who says saccharin is injurious to health is an idiot." Wiley reported that this broke up the meeting and commented that "Had he only extended his royal Excalibur I should have arisen as Sir Idiot."

The following day, the President appointed a Referee Board of Consulting Scientific Experts to reconsider the government's early policies on food additives. Saccharin, as one might have predicted, given the fact that the head of the Board, Johns Hopkins professor, Dr. Ira Remsen, had discovered saccharin, received a pardon from the Referee Board in their re-assessment of its safety. Sugar, therefore, along with Remsen's rebuke of his findings, became the crucible upon which Harvey Wiley's governmental career ultimately fell.¹

The most recent sugar gauntlet was tossed when the World Health Organization's highly publicized 2003 report on Diet, Nutrition, and the Prevention of Chronic Diseases took an unexpected and highly controversial step: it singled out sugar as a threat to the "nutrient quality of diets." Moreover, it specifically recommended a population goal of making free sugars less than 10% of the total dietary energy intake. Maintaining that free sugars provide "significant energy without specific nutrients" and that "diets that are limited in free sugars have been shown to reduce total energy intake and induce weight loss," the report singled out "drinks that are rich in free sugars" saying that they "increase overall energy intake by reducing appetite control." Equally controversially, the report took issue with previous studies that purported to show that free sugars had no effect on excess weight. WHO experts concluded that aside from mere issues of weight loss, that the science did support the idea that there were demonstrable metabolic differences between simple sugars and complex carbohydrates in the daily diet. The WHO report, shifting scientific discussion from calories and weight loss into metabolic functioning, is an indication that sugar is approaching yet another historical turning point in food and drug history.²

“Metabolic Syndrome”

By way of context: the *Journal of the American Medical Association* published an article on January 16, 2002, by researchers at the Centers for Disease Control who estimated that as many as 47 million Americans may have "metabolic syndrome." Metabolic syndrome, as they defined it, was actually a cluster of medical conditions characterized by insulin resistance, obesity, abdominal fat, high blood sugar and triglycerides, high blood cholesterol, and high blood pressure. Previously referred to as "syndrome x", the term "metabolic syndrome" was adopted in May, 2001 by the Third Report of the National Cholesterol Education Program (NCEP) by its Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. The NCEP report made it clear that people who were both fat and inactive had more to pay attention to than merely lowering their cholesterol numbers. CDC's subsequent refinement of a "case definition" was critical to its acceptance by the wider medical community.

The root cause of "metabolic syndrome," most experts agreed, was a "poor diet" and insufficient physical activity. Historically, however, urban diets have often been "poor," but were not necessarily linked with heart disease and diabetes. Clearly exercise is a critical component in the equation and much in the modern era will hinge on a more scientific definition of what constitutes a "poor diet." The WHO report is simply the opening volley in what promises to be a lively new chapter in the history of sugar.

On a lighter note, researching and reassessing the medical histories of former U.S. presidents is a popular parlor game with medical historians, particularly physicians. Over the years I've heard some stellar presentations on the medical histories of Lincoln, Kennedy, Garfield, Taft, and others, but I'll bet I'll be the first historian to retroactively diagnose Theodore Roosevelt with "metabolic syndrome."

Endnotes

[1] Harvey W. Wiley, *The History of a Crime Against the Food Law* (Washington: Wiley, 1911), pp. 162-3.

[2] World Health Organization, Technical Report Series 916, *Diet, Nutrition and the Prevention of Chronic Diseases* (Geneva, 2003), p. 57.