Sugar Controversies

Should government restrict sugar consumption?

When New York City announced in September it will ban sugary beverages larger than 16 ounces in restaurants, sports arenas and other public venues, critics complained that the city has no right to meddle with individual food choices. Many public-health advocates, however, praised the move as an important step toward slowing the nation’s decades-long rise in obesity rates. Sugar-sweetened drinks add an average 300 calories a day to teens’ diets without providing any nutrition, they say. Some scientists even hypothesize that fructose, the main sweetener used in sodas, may trigger diseases such as Type 2 diabetes, which is also on the rise. Other nutrition experts, however, say sugar can’t be the only or even the primary culprit in the nation’s skyrocketing obesity rates, since they have doubled since 1980 while sugar in sodas and other packaged foods has increased by a much smaller percentage over that period.
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Sugar Controversies

BY MARCIA CLEMMITT

The Issues

Starting in March, super-thirsty residents of New York City — at least those who like their beverages super-sized — will be out of luck. Thanks to Mayor Michael Bloomberg, they will be able to buy sugar-sweetened beverages — sodas, sports and energy drinks, teas and sweetened juices — only in 16-ounce or smaller containers at restaurants, food carts and entertainment venues. 1

The new rule, adopted in September by the New York City Board of Health, is designed to “help save lives” and help stem the rising health and financial cost of high obesity rates, said Bloomberg, who proposed it. 2 * Medical costs directly related to obesity are said to cost the city $4 billion a year. 4

The ban has triggered angry complaints that it curtails consumers’ and businesses’ freedoms. “It’s sad that the board wants to limit our choices. We are smart enough to make our own decisions about what to eat and drink,” said Liz Berman, chairperson of New Yorkers for Beverage Choices, a coalition consisting mainly of national and local businesses and business groups who, along with individual New Yorkers, say the ban will hurt them. 5

* New York City’s adult obesity rate of more than 23 percent is actually significantly lower than the national average of about 36 percent. However, while the city’s obesity rate among children ages 6 to 11 has dropped recently, at 21.3 percent it’s still higher than the national average of 19.6 percent. 5

The flap is part of a growing debate over the role of sugar in America’s obesity crisis. Some analysts say excess calories from sugar in processed foods and, especially, beverages are the key culprit in the nation’s sky-high obesity rates and may play additional roles in triggering the rise in obesity-related diseases such as Type 2 diabetes and heart disease.** Thus, they argue, public policies aimed at limiting sugar are justified and harmless, since sugars have no nutritional value.

Other experts say, however, that the scientific evidence so far is lacking to deem sugar consumption the top reason that more than a third of Americans are obese — the highest rate in the developed world. 6 And public policies implemented with insufficient scientific foundation are likely to fail, they contend.

Experts agree that obesity threatens people’s lives and costs the nation precious dollars. In October, state Comptroller Thomas P. DiNapoli reported that New York residents’ obesity-related problems cost public and private payers of medical bills about $11.8 billion annually — $4.3 billion through Medicaid and $7.5 billion through Medicare, private insurers and other sources. 7

Some scientists and policymakers see good reason to focus on so-called “added sugars” — sweeteners added to processed foods and drinks, rather than those found naturally in fruit and milk — as the key driver of obesity rates. In recent decades, manufacturers have put added sugars — such as high fructose corn syrup — into foods ranging from bread and cereal to ketchup and spaghetti sauce. Up to 80 percent of the 600,000 processed-food items sold in America may have added sugars, according to one study. 8

At about the same time that the amount of sugar consumed annually by the average American jumped by

** Excess calories are defined as the calories one consumes in a day beyond the number one burns off through exercise. Type 2 diabetes — also known as adult-onset diabetes — is characterized by “insulin resistance” or an inability of the cells to use insulin, a hormone that regulates the body’s conversion of food to energy.
42 percent — from 110 pounds in the 1950s to 152 pounds in 2000 — obesity rates doubled, from around 15 percent in the 1960s.  

New research also shows that added sugars, such as fructose — a sugar found in both table sugar (sucrose) and the high fructose corn syrup (HFCS) used to sweeten many processed foods today — produces “unique adverse metabolic effects” in the body, according to Frank Hu, a professor of nutrition at the Harvard School of Public Health. Experimental studies show that higher fructose consumption increases the production of free fatty acids — substances that circulate in the blood and may play a role in the development of Type 2 diabetes, Hu says in an email interview.

Such facts make the focus on sugar crucial, said Robert Lustig, a professor of pediatric endocrinology at the University of California, San Francisco (UCSF), and author of the 2012 book, *Fat Chance: Beating the Odds Against Sugar, Processed Food, Obesity and Disease*. “We were not designed to eat all this sugar,” said Lustig, perhaps the most well-known scientist leading the anti-sugar charge. 10

Calories in sugar-sweetened beverages may be the most pernicious, many researchers say, because beverages don’t make people feel full the way solid foods do.

“Human beings are designed to get our calorie requirements from solids and our liquid requirements from liquids,” so people are generally unaware of the calories they consume when drinking a soda, for example, says David Ludwig, director of the New Balance Foundation Obesity Prevention Center at Boston Children’s Hospital. “A child might drink for hydration or socially, and the calories come along for the ride.”

The beverage industry, among others, strongly disputes these arguments. Sugar-sweetened beverages contribute only about 7 percent of the calories in the average American’s diet and “play a small and declining role” in the American diet overall, said the American Beverage Association (ABA). 11 “We know, and science supports, that obesity is not uniquely caused by any single food or beverage,” said the ABA. 12

Some scientists agree that focusing on sugar oversimplifies the nation’s obesity problem.

The cause of obesity is 100 times more scientifically complicated than that of heart disease, so focusing on any one food as the key driver of higher obesity rates is not intellectually serious, said Mike Gibney, a professor of food and health at University College Dublin in Ireland. 13

Moreover, a group of medical scholars and statisticians who reviewed existing research argued that excessive focus on sugar consumption and declining exercise rates have diverted research attention from other potential obesity causes. Those include infections, sleep deprivation, exposure to environmental chemicals and side effects of common medications such as antidepressants and other psychotropic drugs and some treatments for high blood pressure and diabetes. 14

Nevertheless, some analysts say there’s reason enough to craft anti-obesity policies with an eye to limiting sugar consumption. The average adolescent ages 12 to 19 gets about
300 calories per day from sugared beverages, says Sara Bleich, an assistant professor of health policy and management at the Johns Hopkins Bloomberg School of Public Health. Thus, beverages are the single largest contributor of excess sugar calories “and the easiest to eliminate,” she says.

Steve Gortmaker, a professor of the practice of health sociology at the Harvard School of Public Health, says schools and local governments are trying a variety of simple, easy-to-replicate measures, such as Boston’s recent move to eliminate all sugar-sweetened beverages from the public schools. 15

As Americans ponder the potential effects of sugar-laden diets, here are some of the questions being asked:

**Is eliminating excess sugar the best solution to the obesity epidemic?**

Both obesity and some obesity-related diseases such as Type 2 diabetes have soared over the past half-century. Obesity rates doubled between the 1960s and 2000s, for example, and the rate of Type 2 diabetes doubled between the 1970s and 1990s. 16 As these trends continue to escalate, debate has intensified over what causes such health changes and how to reverse them.

Recently, some researchers have suggested that the key culprit is added sugars in processed foods and beverages. Other analysts, however, say obesity-related health problems likely stem from many causes. In addition, they say, little of the data indicting sugar as a particularly dangerous source of extra calories come from randomized, double-blind trials — the only type of study that can reliably demonstrate cause-and-effect relationships.

However, opponents of added-sugar consumption point out that evidence for their theory is expanding. A just-released, randomly controlled trial, for instance, studied 224 overweight and obese adolescents who regularly drank sugar-sweetened beverages. Some were randomly assigned to a group that received counseling or other assistance to help them switch to low-calorie drinks and some to a control group that continued consuming sugared drinks. After one year, the teens who got the help had stopped drinking sugar-sweetened beverages almost entirely and their weight had dropped. 17 “We got a four-pound differential in body weight,” says Ludwig of Boston Children’s Hospital, a study author.

In addition, an analysis of a very large, nearly three-decades-long observational study in the Minneapolis/St. Paul area — the Minneapolis Heart Survey — showed that increased consumption of added sugars correlated closely with weight gain. 18

When it comes to sugars consumed in sugar-sweetened beverages, “It boils down to the question of, 'Is a calorie always a calorie?'” — whether it comes in liquid or solid form, says Richard Mattes, a professor of foods and nutrition at Purdue University in West Lafayette, Ind. At the molecular level, the answer is certainly “yes,” he says. When the body metabolizes sugar — turns it into energy — “you break a certain [chemical] bond and you get energy” of the same amount, he says, regardless of whether a person drank or ate the sugar. But “at the food level the question becomes, ‘which makes you feel fuller?’” because the feeling of fullness helps regulate how much people eat, he continues. Beverages don’t make people feel full. They bypass digestive-system processes that trigger the feeling of fullness that comes from eating solid food. So with sugar-sweetened beverages in the diet, “our total consumption [of calories] tends to go up,” he says.

Some researchers say sugar not only adds excess calories but also metabolizes differently from similar foods — such as starches — so that when consumed in large quantities, it can trigger chronic diseases such as Type 2 diabetes.
Unlike with other foods, the liver takes on a large part of the job of metabolizing sugar, with negative consequences for long-term health, says UCSF’s Lustig. Among other things, metabolizing sugars creates fatty deposits in the liver, eventually compromising its functioning, he says.

But other analysts caution against blaming primarily sugar — especially sugary beverages — for obesity. The current research base “does not demonstrate conclusively that [sugar-sweetened beverage] consumption has uniquely contributed to obesity or that reducing [it] will reduce BMI [body mass index] levels in general,” wrote Mattes and others in a 2010 review of the research. 19

Data suggest that added sugar can’t bear the lion’s share of responsibility for rising obesity, wrote Stephan Guyenet, a research fellow in the Division of Metabolism, Endocrinology and Nutrition at the University of Washington. Americans’ weight rose slowly throughout the 20th century — until fairly recently. The proportion of American adults who are obese, for example, rose from just below to just above 15 percent during the 1960s and through the 1970s, for example. Then the obesity rate more than doubled between 1978 and 2004, rising from 15 to 33 percent. Meanwhile, however, the percentage of added sugars consumed by the average American grew from 86 pounds to 101 pounds annually, a 17 percent increase that Guyenet says isn’t nearly enough to account for the obesity increase. 20

Research suggests that “even if you have people drink a liter a day” of sugar-sweetened drinks, “they don’t gain as much weight as you’d expect,” says Kathryn Kaiser, an instructor in the statistical genetics department of the School of Public Health at the University of Alabama, Birmingham, and a coauthor on Mattes’ 2010 research review. The group is currently preparing a new analysis that will include the Ludwig study cited above and another study that appeared in the same issue of the New England Journal of Medicine last month.

Fructose is a simple sugar that is found in many plants and is a substantial component of both sucrose (table sugar) and high fructose corn syrup (HFCS), which comes from corn. Critics say fructose is dangerous because it metabolizes solely in the liver, which leads to health problems. Glucose — the other main simple sugar humans consume, and which is also found in plants, including corn — is metabolized in every cell of the body.*

There is a good, historical reason to suspect fructose, said Lustig. “Our consumption of HFCS has gone from less than half a pound [per person] per year in 1970 to 56 pounds per year” in 2011, he said. 21 During the same period, the percentage of obese 12- to 19-year-olds nearly tripled, from 6.1 percent to 17.4 percent. 22

Beginning in the mid-1970s, HFCS became a standard ingredient in many processed foods, and in 1980 its use skyrocketed when it became the sweetener of choice for sodas and other beverages, Lustig says. “You can actually trace the prevalence of childhood obesity to 1980 when this change was made.”

Lustig goes so far as to call sugars containing fructose “toxic.” When ingested at a high enough dose, he says, “anything can be a poison” — even something as innocuous-seeming as water. (Drinking too much water can lead to mental confusion, brain swelling and possibly death.) He believes fructose-containing sugars likely have now passed the dose threshold to be toxic to at least some people. For example, sugar-sweetened sodas, once sold in six-and-a-half or eight-ounce cans, are now routinely consumed as 32-ounce — one quart — drinks, he notes.

However, sugar is not the kind of toxin that quickly kills outright, like arsenic, * Sucrose (table sugar) is a 50-50 combination of fructose and glucose. The high fructose corn syrup used in the United States today is 55 percent fructose and only 45 percent glucose.
Lustig says, but rather is a “chronic” poison that damages the liver over time.

Among other things, fructose may activate a mechanism that produces fat directly in the liver to a greater degree than other sugars and carbohydrates and similarly to how alcohol behaves in the liver, he contends. In some cases, a fatty liver can lead to serious, even fatal, diseases, although the mechanisms of these conditions and whether any relate to fructose consumption is unknown. Some studies suggest that fat in the liver could cause insulin resistance — a reduction in cells’ ability to take up glucose and convert it to energy, which is a precursor of Type 2 diabetes.

Rats fed large amounts of fructose over the long term develop insulin resistance within and outside the liver, obesity, Type 2 diabetes and high blood pressure, according to Luc Tappy, a physiologist at the University of Lausanne, in Switzerland.

“I think there’s something to the fructose concerns, although only when fructose is present in large amounts, which it often is,” says Marion Nestle, a professor of food studies, nutrition and public health at New York University in New York City, in an email interview. A well-known author and advocate of healthy eating, Nestle is a former senior nutrition policy advisor in the Department of Health and Human Services and was editor of the “Surgeon General’s Report on Nutrition and Health.”

But others say existing research doesn’t allow firm conclusions about fructose. Some scientists, for example, point out that most research on fructose has been conducted on animal, not human, subjects and involves feeding higher amounts of the sugar than real-world diets contain.

While some studies suggest unusual health effects, there is “no unequivocal evidence that fructose intake at moderate doses is directly related with adverse metabolic effects,” said Tappy.

Those who argue that fructose poses particular dangers base their contention on the fact that when the liver metabolizes fructose, the body’s vital insulin response — which regulates the conversion of food to energy — is not triggered, says Purdue’s Mattes. But that may not matter, he says, because fructose is virtually always consumed along with some glucose, which does trigger the insulin response.

Analysis of existing studies demonstrates that, like other sugars, fructose causes health problems only if it provides extra calories in the diet beyond those we need, said John Sievenpiper, a resident physician in medical biochemistry at McMaster University in Hamilton, Ontario. Researchers have discovered biological mechanisms through which fructose metabolism might produce the harms observed in rats, Sievenpiper said. But when scientists have substituted fructose for another sugar in otherwise equivalent diets, the increased blood pressure and other negative consequences have not appeared, he said.

Animals also metabolize fructose and other carbohydrates differently from the way humans do, so while fructose may be “bad for rats or mice . . . it doesn’t seem that it’s the case in humans,” Sievenpiper said.

**Should the government do more to limit sugar consumption?**

Few doubt that excess calories, many provided by sugars, are at least partially to blame for rising obesity rates. Disagreements are intense, however, over whether the evidence for sugars’ role is compelling enough to justify government action, such as heavily taxing some sugary foods.

Trying to dissuade people from consuming extra sugar calories, especially in beverage form, should be an obvious strategy because it “does no harm,” said Harvard’s Hu. And virtually all health experts agree that most Americans would benefit from consuming fewer calories.

But other analysts warn that imposing limits on people’s pleasures
based on insufficient evidence could backfire, potentially causing them to rebel against other, truly urgent science-based laws and regulations later. Whether enough evidence to warrant policy action already exists “depends on which action [is taken], in which regulatory context and according to whose tastes and moral values,” said David Allison, director of the Nutrition Obesity Research Center at the University of Alabama, Birmingham. 30

The public costs of the obesity epidemic justify public action to limit sugar consumption, said the University of California’s Lustig. Treating obesity-related health problems such as Type 2 diabetes, he said, is throwing $147 billion a year in public funds “down a rat hole.” 31

“Given the large proportion of people who claim that they want to lose weight and the small proportion who are actually able to do so,” it’s clear that people do, in fact, need help to improve their diets, wrote Deborah A. Cohen, a senior natural scientist at the Santa Monica branch of the RAND Corp. think tank, and Susan H. Babey, a senior research scientist at the UCLA Center for Health Policy Research. Simple changes, such as banning the sale of sugar-heavy junk foods near supermarket checkout counters could help people make better eating decisions, they suggest. 32

Tax increases that raise prices and thus dissuade some people from buying unhealthy products have worked in the past, say proponents of raising taxes on sugary beverages. For example, a 10 percent price increase on cigarettes has been found to reduce sales by about 3 percent overall and by 7 percent among teenagers. 33

“Even though there is more to learn, we know enough to be giving firm dietary advice and taking policy actions” to dissuade people from consuming so much sugar, says Walter Willett, chair of the Department of Nutrition at the Harvard School of Public Health. “These dietary and beverage patterns can be encouraged and supported by many different policies, from local to national,” he says. “Of course, each of these policies needs to be monitored and evaluated for impact, but we can’t afford to wait and do nothing just because we don’t have long-term data on the impact of each policy.”

But other analysts say sugar’s harms aren’t fully proven and that limiting people’s pleasures can backfire. The analogy between tobacco bans or taxes and similar measures related to
sugar-sweetened beverages isn’t valid, wrote Robbin S. Johnson, a research fellow at the University of Minnesota’s Hubert H. Humphrey School of Public Affairs and a retired senior vice president of the Minneapolis-based food conglomerate Cargill, Inc., which sells sugar and HFCS. Smoking is “hazardous to one’s health under any circumstances,” but sugar-sweetened beverages “are not intrinsically hazardous or even problematic. . . . Behavior, not bad food,” should be the target of obesity-related policy interventions, he wrote.

Furthermore, “there is nothing about a soda tax per se that contributes to the growth in understanding that would lead most directly to the kind of behavior change needed to arrest and reverse obesity,” wrote Johnson.

Product bans have been tried “before, with more evidence to back [them] than in the case of sugar-sweetened beverages (and with fewer potential costs in terms of freedom), and we have failed to change behavior,” wrote Cornell University’s David R. Just, an associate professor of behavioral economics, and Brian Wansink, a professor of marketing. “Prohibition, for instance, was intended to wipe out the ills of alcohol, but it could not withstand the violent backlash, subversion and illegal consequences that quickly followed.”

They suggest milder approaches, such as encouraging stores to move sugar-sweetened drinks to less prominent locations. “Simple behavioral nudges, such as making soft drinks less visible and less convenient, can have a big effect on consumption,” they write.

“One of the most interesting things coming out right now is that young- sters are substituting other sweetened drinks,” such as sweetened juices or lemonade and sports drinks — which many teens believe are healthier — when a school system bans sodas, making the school bans useless, says Daniel Taber, a postdoctoral research associate at the Institute for Health Research and Policy at the University of Illinois, Chicago. “Unless you comprehensively ban all sugar-sweetened beverages,” the likelihood of limiting sugar consumption is low, he says.

At least partly because of such dietary substitutions, little correlation seems to exist between the level of soft-drink taxes and obesity, said Jason Fletcher, an associate professor of health policy and administration at the Yale University School of Public Health. That’s probably because, unlike with cigarettes, when higher prices discourage soda buying, people have other equally high-calorie options to turn to, he said.

Meanwhile, industrialized nations’ health concerns have shifted from infectious diseases toward chronic ills such as heart disease and Type 2 diabetes, which are associated with obesity, at least in some cases. In turn, not surprisingly, sugar has come under scrutiny as a potential cause.

Sugar consumption by Europeans and North Americans began rising in about 1700, as huge sugar-cane plantations were established in places such as Brazil and the West Indies to satisfy a

**Background**

**Sweet Eating**

Humans are biologically programmed to seek out sweet tastes. In nature, sweetness signals ripe, wholesome fruit or energy-boosting honey. In a world of hunting and gathering or simple farming, however, sweet tastes were hard to come by.

Industrialization has turned that principle on its head. Over the past three centuries, and partly as a result of public policies to keep food costs in check and boost economies, sugary tastes have grown ever cheaper and more readily available.

Added sugars have risen continually as a component of U.S. diets for at least 200 years, wrote Guynenet, of the University of Washington. In 1822, the average American ate 6.3 pounds of added sugars a year. By 2004, it was 101 pounds. Over the past three decades, especially, sugar has been added to thousands of processed foods and beverages.

Meanwhile, industrialized nations’ health concerns have shifted from infectious diseases toward chronic ills such as heart disease and Type 2 diabetes, which are associated with obesity, at least in some cases. In turn, not surprisingly, sugar has come under scrutiny as a potential cause.

Sugar consumption by Europeans and North Americans began rising in about 1700, as huge sugar-cane plantations were established in places such as Brazil and the West Indies to satisfy a
growing public desire for sweet tastes. By 1865 in Brisbane, Australia, for example, plantations produced about 2,200 pounds of sugar every day. Even so, the sweet treat “was still expensive, and wasn’t being eaten every day by anyone but Queen Victoria and her mates,” wrote David Gillespie, the Australian author of the 2008 book *Sweet Poison: Why Sugar Is Making Us Fat*.

By the turn of the 20th century, however, sugar was becoming a daily menu item for the working and middle classes. Many cheap sweet treats were invented around this time, such as Hershey’s chocolate bars and Life Savers.

**Rise of Corn**

In the 1970s, a new sugar option came on the market. Food scientists figured out how to mass-produce and use high fructose corn syrup, especially in commercial cooking. Unlike older sugars, which came from sugar cane and sugar beets and had as much of the simple sugar glucose as fructose, HFCS was derived mainly from corn, a quintessential and plentiful North American crop whose adaptability to multiple uses makes it a highly valuable export product.

Ounce for ounce, HFCS is sweeter than the other sugars, lowering the cost of sweetening food. It helps keep foods from drying out, is less likely to ruin foods by quickly crystallizing, fends off spoilage and works well in frozen foods and beverages.

Federal farm policies initiated in the 1970s boosted the use of HFCS, after President Richard M. Nixon “appropriately saw high food prices as a cause of potential unrest” among citizens and sought ways to keep them low, says Lustig, the pediatric endocrinologist at the University of California-San Francisco.

Most farm policy involves subsidies and price supports to ensure that farmers consistently earn enough income to encourage them to keep farming. Prior to the Nixon era, the government achieved that mainly by paying farmers to keep some land unplanted. That kept the food supply tight so crop commodity prices wouldn’t fall too low.

Nixon Agriculture Secretary Earl Butz, however, encouraged dense planting, especially of foods with multiple uses such as corn, to provide cheap food and to bolster American agribusiness exports. By providing billions of dollars in subsidies over the years to farmers to grow as much corn as their acreage allows, the government has kept corn prices low while ensuring that farmers could earn a good income. And with corn so cheap, food processors were motivated to incorporate more corn sweeteners into products.

Ironically, according to the Institute for Agriculture and Trade Policy (IATP), which promotes family farms and sustainable agriculture, as the U.S. government was encouraging massive increases in production of corn and other grains, it did not subsidize healthier foods such as fruits and vegetables to the same degree. “For the past 50 years, U.S. farm policy has been increasingly directed toward driving down the price of farm commodities, including corn and soybeans,” says an IATP fact sheet entitled, “Food Without Thought: How U.S. Farm Policy Contributes to Obesity.” “At the same time, prices for fruits and vegetables, grown with relatively little government support, have steadily increased.”

As a result, “The low cost of commodities . . . makes sugars and fats some of the cheapest food substances to produce,” the IATP continues. “Whether by intention or not, current farm policy has directed food industry investment into finding ways of using these cheap food additives in processed foods. Not coincidentally, U.S. consumers are now eating many more added sweeteners and oils than is healthy.”

Lustig sums up the problem succinctly: “A calorie has become very cheap.”

Soon corn sweeteners found their way into “things that never had sugar before, like hamburger buns, hamburger meat, barbeque sauce, ketchup, salad dressing,” Lustig said. Our biologically programmed craving for sweetness added few calories when sweet foods were scarce and pricey, but when corn became cheap and plentiful, “the food industry figured it out . . . and hijacked our taste buds” to make their wares more appealing, said Lustig.

Over the same period, obesity and related diseases were on the rise. In 1900, the average college-age man weighed 133 pounds and a woman, 122 pounds. By 2000, those averages had risen to 166 and 144 pounds. (Men’s average height also increased slightly, but not enough to fully account for the weight gain.)

Heart disease was also on the rise, and long-term surveys of very large groups of people showed that, although thin people also develop heart disease, obesity is perhaps the strongest risk factor for the condition. Exactly how obesity leads to heart disease remains unclear, although scientists now know that, rather than being an inert part of the body, at least some body fat actually affects the way our metabolism operates.

In public-health circles, concern arose about whether changing diets were fueling obesity-related disease, and some initial suspicion fell on sugar. In 1972, John Yudkin, a British physiologist, published *Pure, White and Deadly*, a book proposing that added sugars were a key cause of heart disease.

In 1973, Sen. George McGovern, D-S.D., convened a hearing of the Select Committee on Nutrition and Human Needs to discuss potential links between sugar and disease. Some witnesses testified that differences in added-sugar consumption most likely...
1900s-1950s

After centuries as a luxury item, sugar becomes a diet staple.

1900
Hershey’s chocolate bar introduced.

1912
Peppermint flavored Life Savers are introduced.

1955
McDonald’s begins selling Coke in seven-ounce servings.

1957
High fructose corn syrup (HFCS) is invented but without a method to mass produce it.

1970s
Mass-produced corn sweeteners lower the cost of sugared food and drinks.

1972
In *Pure, White and Deadly*, British physiologist John Yudkin argues that added sugars lead to heart disease.

1973
Senate Select Committee on Nutrition and Human Needs hears testimony on possible links between added sugars and diabetes. Agriculture Secretary Earl Butz introduces corn subsidies and fencerow-to-fencerow planting to ensure plentiful low-priced corn.

1980s-1990s

Americans adopt low-fat and nonfat diets, but more foods have added sugar. Obesity rises steeply.

1980
HFCS is rapidly becoming the main sweetener in sodas.

1988
“Surgeon General’s Report on Nutrition and Health” declares fat the unhealthiest food item.

1994
Men take in 90 percent more calories from snacks than in 1978, women 112 percent. Nearly 23 percent of adults are obese.

2000s
Obesity-rate increases slow. Schools cut back on the amount of sugary food and drinks they sell and serve.

2000
On average, a college-age man weighs 166 pounds, a college-age woman, 144 pounds — up from 133 and 122 pounds in 1900.

2004
More than 17 percent of 12- to 19-year-olds are obese — up from 6 percent in the 1970s. Adult obesity rates top 33 percent. The average American consumes more than 100 pounds of added sugars annually — up from 86 pounds in 1978.

2005
Kraft Foods stops advertising sugary snacks during TV shows for young children.

2009
“Sugar: The Bitter Truth,” a lecture posted online by University of California, San Francisco, pediatric endocrinologist Robert Lustig, argues that too much sugar is toxic; it becomes a YouTube sensation, garnering nearly 3 million views by 2012.

2010
Between January 2009 and May 2010, 17 states file proposals for new soda taxes. Eighty-eight percent of high schools and 63 percent of middle schools sell sugared drinks, down from 95 percent and 78 percent in 2006. Department of Agriculture’s Dietary Guidelines recommend that no more than 15 percent of calories come from added sugar and solid fats; the average American gets about 15 percent from added sugars alone.

2011
Four federal agencies propose, then withdraw, voluntary guidelines urging companies to market healthier, lower-sugar foods to kids. Working with the Better Business Bureau, 16 food companies commit to marketing healthier food to kids, including limiting sugar. KFC introduces 64-ounce sodas.

2012
New York City Mayor Michael Bloomberg and the city’s Board of Health limit sugared drinks sold in restaurants, entertainment venues and food carts to 16 ounces or smaller; restaurant and beverage associations challenge the policy in court. Obesity-related health care for New York state residents costs $11.8 billion a year. Average 12- to 19-year-old gets 300 calories a day from sugared drinks. Cambridge, Mass., Washington, D.C., and Los Angeles mull limiting sugary-drink sales. Food and Drug Administration considers listing added-sugar totals on food labels. Voters in Richmond and El Monte, Calif., defeat proposed soda taxes. National Institutes of Health plans to study health effects of fructose.
Artificial Sweeteners Raise Hope — and Concern

They may help with weight loss, but are they safe?

Not all Americans guzzle sugary drinks by the barrel. In 2008 around a quarter of weight-conscious American adults and more than 12 percent of children said they regularly drank artificially sweetened, or “diet,” sodas instead. 1

On the weight-loss front, that’s undeniably good news. “The evidence is now clear from randomized trials that artificial sweeteners can help reduce weight if they replace standard sugar-sweetened beverages,” Walter Willett, chair of the Department of Nutrition at the Harvard School of Public Health, said in an email interview.

Nevertheless, artificial sweeteners are relatively new products, so the effects of consuming large amounts of them for decades isn’t fully understood, prompting scientists to advise using them in moderation. Artificial sweeteners “are not the ideal long-term solution,” said Willett, but they can “be useful in helping some people withdraw from products that are seriously harmful to their health.”

The Food and Drug Administration (FDA) has approved for human consumption five so-called artificial sweeteners that consist of manmade molecules: saccharin, aspartame, acesulfame potassium, sucralose and neotame. (See box for brand names.) 2

A sixth approved non-caloric sweetener, rebaudioside A, is a natural extract from the stevia plant.

The FDA banned a seventh sweetener, cyclamate (Sucaryl), in 1969 based on studies suggesting it caused bladder cancer in rats. Worried about a surge in sales of diet soda sweetened with much cheaper artificial sweeteners, the sugar industry was one of the loudest groups sounding the alarm about potential health dangers from cyclamate. 3

“If anyone can undersell you nine cents out of 10, you’d better find some brickbat you can throw at him,” remarked John Hickson, vice president of the sugar-industry-affiliated International Sugar Research Foundation. 4

A subsequent study 20 years later found that monkeys fed massive amounts of cyclamate remained cancer-free, raising serious doubts about the applicability of the rat findings to humans and other primates. “With cyclamate we made a mistake,” said Robert Scheuplein, an FDA scientist who headed the agency’s toxicology office in the early 1990s. 5

Cyclamate remains banned in the United States, but it is sold in Canada — as SugarTwin — and throughout Europe. Research has produced no clear evidence that any approved artificial sweetener is associated with human cancers, says the National Cancer Institute. 6

Aspartame comes under fire from food-additive opponents in part because, in storage and during digestion, it breaks down into methanol (wood alcohol) and then formaldehyde, best known as an embalming chemical. 7 Toxicologists point out, however, that most fruits and vegetables break down into the same chemicals and that the body makes use of them without allowing toxins to accumulate. 8

Plenty of questions remain about artificial sweeteners’ effects on the body, however. The San Antonio Heart Study, for example, which followed 3,682 adults for eight years, found that those who consistently used artificially sweeteners weighed more. 3 Such results leave some scientists wondering whether the sweet taste of noncaloric sweeteners might stimulate the appetite more than sugar.

In search of answers, researchers use brain imaging to discover how humans respond to calorie-laden and no-calorie sweet tastes and observe rats that are fed both sugar and artificial sweeteners.

A typical diet — which includes both calorie-rich and no-calorie sweets — may confuse the brain, said Susan Swithers, a professor of behavioral neuroscience at Purdue University in West Lafayette, Ind. “The brain normally uses a learned relationship between sweet taste and the delivery of calories” to regulate eating by switching off hunger pangs after consuming sugar.

Low-Fat Craze

Soon consensus formed around dietary fats as the likely culprit in rising obesity.

In the mid-1980s, the National Institutes of Health began counseling Americans to cut out fats. In 1988, the massive “U.S. Surgeon General’s Report on Nutrition and Health” declared fat the single unhealthiest food in the American diet. The American Heart Association opined that if low-fat eating became the norm, atherosclerosis — fat-clogged arteries — would be a thing of the past by 2000. 51

Low-fat and fat-free products soon were everywhere, but because the fat had provided flavor, manufacturers began adding more sugars in order to boost the appeal of fat-free foods. Obesity rates kept rising throughout the ’90s. “With more fat-free products than ever, Americans got fatter,” says Harvard’s Willett.

The proportion of Americans who are overweight but not obese has...
But when one eats both no-calorie and calorie-rich sweeteners, the appetite-suppression mechanism may go haywire and lead to overeating, she hypothesized. 10

Another recent study, however, found no link between artificial sweeteners and appetite, said its lead author, Bjørn Richelsen, a professor of endocrinology and metabolism at Denmark's Aarhus University.

In a test of how hungry people were after drinking water, milk, Coke or Diet Coke, “we found if you’re drinking soft drinks without calories it behaves [on the appetite] exactly like drinking water,” Richelsen said. 11

— Marcia Clemmitt


4 Quoted in ibid.

5 Quoted in ibid; also see Robert J. Scheuplein, Ph.D., Keller and Heckman LLP, www.khlaw.com/Robert-Scheuplein.


### Brand Names of Sugar Alternatives

**Artificial sweeteners** — which contain few or no calories — can help reduce weight when used to replace sugar-sweetened beverages, but scientists advise using them in moderation because the effects of consuming large amounts of them over the long term are not fully understood.

**Artificial Sweeteners** (derived from man-made substances):

- **Acesulfame Potassium** — Sunett, Sweet One
- **Aspartame** — Nutrasweet, Equal
- **Neotame** — no brand name; used as an additive by food processors
- **Saccharin** — Sweet ‘N Low, Sweet Twin, SugarTwin
- **Sucralose** — Splenda

**Natural Noncaloric sweetener** (derived from the stevia plant):

- **Rebaudioside A** — PureVia, Steviva, A Sweet Leaf, Sun Crystals, Truvia

Source: American Diabetes Association and Sharecare, www.sharecare.com/question/what-common-brand-artificial-sweeteners

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hovered at around a third of the population since the 1960s, but obesity rates have soared, rising from around 15 percent in the 1960s and ’70s to more than a third of the population today. 52 (A 5’9” tall adult is overweight if he weighs 169-202 pounds and obese at 203 pounds or more, for example.) 53

It seems likely that added sugars bear much of the blame, but the issue is complicated.

Over the past three decades, Americans have increased their average daily calorie intake by between 150 and 300 calories, with approximately half coming from sweetened beverages. 54 In 2000, the average American consumed 152 pounds of calorie-containing sweeteners annually, up from about 110 pounds in the 1950s. 55

Another statistic seems to link obesity and added sugar: Between about 1999 and 2008, as consumption of added sugars declined — mostly because people drank fewer sugarsweetened sodas — obesity rates began to stabilize. 56 “There is a positive correlation between the obesity trends and increasing consumption of sugar, but this correlation needs to be interpreted with caution because many other things have happened during the same time period,” says Harvard’s Hu. For example, more people today have sedentary jobs and drive rather than walk to work or school.

With regard to diets, consumption of other high-caloric foods has risen along with sugar consumption. Cheese consumption, for instance, jumped 287 percent between the 1950s and 2000 — from about 8 pounds per
Path to Better Eating Strewn with Traps

*Salad for lunch? Better count the added calories.*

From sugar-laden processed foods to supersized sugary sodas, the American diet provides abundant opportunities for people to consume more calories than they realize. And trying to figure out the sugar content on a food label can be challenging, say nutrition experts, because the true sugar content is often obscured.

Most packaged foods and beverages — from salad dressings and bread to sports drinks — contain added sugars, often quite a bit. Over the years, those added sugars — separate from sugar that occurs naturally in fruits and milk — have become a larger and larger source of calories in the American diet. But unlike fruits and milk, added sugars lack nutritional value — they only provide flavoring and calories.

The American Heart Association recommends getting only about 100 to 150 calories a day from added sugars. But abiding by that limit is challenging, because while finding out the total amount of sugar in a food is easy, spotting the added sugars can be devilishly difficult.

That’s because food nutrition labels don’t list added sugars separately. They list only the total sugar — stated in grams — contained in the food or drink. If there are no fruit or milk products in the food, the “total sugar” listed on the label is the amount of added sugar.

For food containing fruit or milk, scrutinizing the ingredient list can provide some clues as to whether the food contains large amounts of added sugar. By law, manufacturers must list ingredients by weight, so those at the top of the list are present in the largest quantities. But manufacturers “know people are reading labels to find out how much sugar is in the product,” explained Jonny Bowden, a weight-loss coach in Woodland Hills, Calif. “So they mix in a small amount of lots of different sugars. That way, no single kind of sugar is the main ingredient by weight. [But] add them all up, and sugar outweighs anything else in the recipe.”

In an ingredient list, sugars go by many names. Besides the word “sugar” — such as “turbinado sugar” (a form of brown sugar) — other sugars might be listed as corn syrup, dextrin, honey, corn sweetener, evaporated cane juice, high fructose corn syrup, malt, molasses, fruit juice concentrate, molasses and sorghum. And any word that ends with “ose” — such as dextrose, lactose, maltose, sucrose, polydextrose and galactose — is likely a sugar.

Added sugars can add up quickly. A light lunch of a green salad spiced up with a couple of tablespoons of low-fat salad dressing (5 grams of added sugars) and accompanied by half a bottle of sweetened vitamin water (15 grams) contains 20 grams of sugar. Since all sugars contain about four calories per gram, that’s 80 calories from added sugars, fast approaching the heart association’s daily recommendation of no more than 150 calories.

Sugar-sweetened beverages pose another label trap. One bottle generally contains two to four “servings” of a drink, but the calorie count on the nutrition label is for just one serving, says Joanne Slavin, a nutrition professor at the University of Minnesota-Twin Cities. In an ideal world, she says, “labels would list the full number of calories in the bottle, not per-serving calories.” But unless that happens, consumers must figure out that downing a bottle of energy drink or soda may provide two to three times as many calories as they imagine, Slavin says.

People are more likely to consume hefty amounts of sugar and calories via beverages than in foods, say nutrition scientists, because beverages don’t trigger the same sensations of fullness that solid foods do. So cutting down on sugar-sweetened beverages is a good place to start to bring into better balance the energy one consumes and the energy one expends, says Sara Bleich, an assistant professor of health policy and management at the Johns Hopkins University Bloomberg School of Public Health.

Contemporary diets also include many highly processed foods — with natural fiber removed — another change likely related to obesity, the University of California’s Lustig argues. Removing fiber gives some perishable foods a longer shelf life, but at a cost to health, Lustig says. Oranges, for example, are perishable and are ruined by freezing, he says. “But if you squeeze the orange” — removing the fiber — “it can last forever,” in the form of frozen juice, which is mostly sugar.

Humans digest fiber-free foods differently than foods high in fiber, Lustig says. When unprocessed foods — such as fruits — are eaten, the sugars are accompanied by fiber. Among other effects, fiber reduces the rate at which the bloodstream absorbs sugar from the gut, avoiding the blood-sugar spike that occurs when one drinks fiberless juice, and it causes the food to move faster through the intestine, which triggers an “I’m full” signal sooner. “The removal of fiber was as important as sugar” in creating what Lustig calls the modern obesity-driving diet.
“The more processed the food got, the fatter we got,” he says.

Limiting Sugar

Policies to limit sugar consumption have increased, especially in the past decade.

In the past, states have taxed sugary foods such as soda and candy, but initially such taxes aimed to generate revenue, not to discourage consumption. For instance, revenue from the nation’s first sugary soda tax — levied in 1917 on ingredients used to manufacture soda — was used to help pay for fighting World War I. 59

But as obesity rates rose, states began to view soda taxes as a public-health measure. 60 Between 1989 through 2006, for instance, up to two dozen states in any given year imposed taxes on soft drinks, with average rates ranging from 4.1 to 5.1 percent. 61 Between January 2009 and May 2010, at least 17 states proposed — though few passed — new soft-drink taxes. 62

Some jurisdictions have banned sugary food and drink sales from school grounds. In the 2006-2007 school year, 95 percent of high school, 78 percent of middle-school and 17 percent of elementary-school students could buy sugar-sweetened beverages at school. By 2010-2011, those percentages had dropped to 88 percent, 63 percent and 12 percent, respectively. 63

Some states and school districts, such as California and Arkansas, have aggressively limited junk-food sales, says Taber of the University of Illinois.

2 Ibid.
5 Ibid., (Johnson).
America’s highest obesity rates are in the South, and those states “have realized that a problem obesity is for them,” he says. (See map, p. 1016, and graph, p. 1020.)

In 2011, four federal agencies — the Department of Agriculture, Centers for Disease Control and Prevention, Federal Trade Commission (FTC) and Food and Drug Administration — proposed voluntary guidelines for food companies to follow in curtailing the marketing of high-sugar and other less healthy foods to children and promoting healthier foods more actively.

“The proposal is designed to support, not supplant, moms and dads,” said Rep. Jan Schakowsky, D-Ill. “The more marketing that kids see for foods that make up a healthy diet, the more kids will start asking for healthier foods.”

Congressional Republicans quickly denounced the plan as an encroachment on companies’ and families’ freedom. The guidelines were “so extreme” they would prevent companies from marketing to children some foods that most parents try to get their kids to eat, such as yogurt sweetened with sugar, said Rep. Fred Upton, R-Mich. Early this year, FTC Chairman Jon Leibowitz suggested that the voluntary guidelines will likely be withdrawn.

Meanwhile, food companies have taken some steps on their own to discourage overconsumption of sugars. For instance, in 2005, Northfield, Ill.-based Kraft Foods announced it would stop advertising snack foods such as Oreo cookies during TV shows aimed at young children.

In summer 2011, some food companies agreed to voluntarily stop marketing some less healthy foods to kids. For example, the companies have vowed that by January 2014 they would market to children only cereals with 10 grams or less of sugar per serving.

But the Environmental Working Group (EWG), a Washington-based health advocacy organization, noted that that’s still more sugar than in three Nabisco Chips Ahoy! Cookies.

“Kids need healthy food, not hyped junk,” says EWG. A backlash has developed against such measures in some communities. On Nov. 6, voters in two California towns — Richmond, near San Francisco, and El Monte, near Los Angeles — defeated proposed soda taxes, with 67 percent and 77 percent, respectively, voting against the measures.

At the federal level, the Food and Drug Administration recently received public comments on a proposal to include “added sugars” — sugars that do not occur naturally in foods — as a separate category on food nutrition labels. (See sidebar, p. 1024.) In January, the U.S. Department of Agriculture (USDA) released new — controversial — nutrition rules for public-school lunches and breakfasts, championed by first lady Michelle Obama. Among other things, the rules forbid serving frozen fruits that contain added sugars or canned fruits packed in heavy, high-sugar-content syrup; they limit grain-based desserts such as cake or granola bars to two per week because of their high added-sugar and solid-fat content.

But many kids are refusing to eat many of the low-sugar, low-fat, high-fiber foods being served, so they’re not eating enough to get through the day, complain many parents and school officials.

“Our trash cans are overflowing with fruits and vegetables the students don’t want,” said Rich Prall, nutrition director of Utah’s Granite School District.

Some nongovernment institutions also are limiting sugared drinks. Four Vanguard hospitals in the Chicago area are replacing sugar-sweetened beverages in cafes and vending machines with healthier options such as bottled water. In Boston, 10 hospitals are cutting out some sugary beverages from soda fountains and patient meal trays and are

Continued on p. 1030
great many things contribute to America’s horrific obesity epidemic, and it’s going to take a wide range of government policies to help Americans eat better (and less) and exercise much more. But at the top of any serious policy maker’s list should be a concerted effort to reduce Americans’ out-of-control consumption of soda and other sugary drinks.

Soda plays a unique role in promoting obesity and other diet-related conditions such as heart disease and diabetes. Unlike most foods, soda has no redeeming protein, vitamins, minerals or dietary fiber — just sugar, usually in the form of high fructose corn syrup, and sometimes questionable chemicals. Sugary sodas are the largest single contributor of excess calories in American diets and have been proven in studies to consistently cause weight gain. These drinks are a problem because so many Americans consume huge volumes of them, and because, unlike the calories in solid foods, the calories in soda aren’t fully recognized by the body — meaning that people don’t compensate by eating or drinking less of other things. All in all, it’s as if soda were engineered for the specific purpose of promoting obesity: a time-delayed metabolic bioweapon.

Fortunately, we’ve seen progress. Schools have largely expelled soda (though not high-calorie Gatorade-type “sports” drinks). Calorie counts coming to menu boards will remind consumers of soda’s heavily caloric payload. Mayors in Boston, Philadelphia, San Antonio, San Francisco and elsewhere have eliminated or reduced soda in vending machines on public property. New York City has instituted a sensible 16-ounce cap on the size of sodas sold in the city’s restaurants. And cash-strapped city and state governments are considering taxes on soft drinks — both for the desperately needed revenue and to reduce consumption.

Government could also end a subsidy to the soda industry that might be as high as $4 billion a year by testing the effectiveness of prohibiting the use of Supplemental Nutrition Assistance Program (SNAP) benefits (formerly food stamps) to buy sugary drinks. The program already excludes other products that don’t make nutritional sense, such as tobacco, dietary supplements and ready-to-eat hot foods. Simultaneously, the SNAP program could subsidize the purchase of fresh produce and perhaps other especially healthful foods.

To do nothing — while sugary drinks fuel an epidemic of obesity and other expensive diseases — would be reckless from a public health and a fiscal standpoint.

As any student of history knows, Americans can get pretty testy when the government tries to meddle with their beverage of choice. While it’s hard to imagine modern Bostonians dumping cans of Coca-Cola Classic into the harbor in protest, Americans still don’t like government telling them what to drink.

When it comes to curbing soda consumption, governments at all levels tend to tax first, ask questions later. But where soda taxes have been implemented, the consumption of sugary drinks hasn’t gone down. Instead, state revenues have gone up. And that’s not a coincidence. Soda drinkers tend to be poorer than nondrinkers — making any such tax regressive — but they aren’t terribly price sensitive when it comes to that large Pepsi. After all, there’s already a free alternative out there waiting to quench thirst. Meanwhile, there are no serious proposals afoot to apply a similar tax to Jamba Juice, Starbucks pumpkin lattes or similarly sugary drinks preferred by wealthier consumers.

Awareness campaigns are an easier sell. What’s wrong with giving consumers more information? But government-funded ad campaigns about the contribution of soda to obesity have their limits as well. They’re not exactly conveying breaking news, for one thing: No one thinks that a full-sugar soda is a health food. To compensate, public awareness campaigns tend to overstate their case in their zeal to do good and drive the message home. The New York City Department of Health ran ads in January showing a black and white photo of an obese man whose right leg appeared to have been amputated behind a reminder to drink smaller cups of soda. Just one problem: The chunky man in the ad actually has two healthy legs. One was photoshopped out for propaganda purposes. New York Mayor Michael Bloomberg defended the decision, saying: “You can’t have it both ways. Do you want to help people or do you not want to annoy people?”

But the main reason government shouldn’t fiddle with our drink orders is one that those guys who once dumped tea in the Boston Harbor would understand: People should be free to make their own choices and their own mistakes. People engage in all kinds of “unhealthy” behaviors like eating jellybeans and “forgetting” to floss. Some of those behaviors cost taxpayers money and some don’t, but just because something is a terrible idea doesn’t mean it is the business of the state to advise against, restrict, tax or otherwise limit it.
In one rigorous study, all the participants lost weight after being put on diets, but those who reduced their consumption of sugar-sweetened beverages saw the greatest reductions in blood pressure, Shay says. In this study and others, she says, the evidence has been “pretty convincing” that sugar consumption causes other health risks besides excess calorie intake. But the studies have had very small sample sizes, so additional research is needed, she says. If the results hold up, it could open the door to improving blood-pressure control by, for example, limiting intake of high fructose corn syrup (the main sweetener used in most sodas today), she notes.

Researchers now are reanalyzing data collected in older, large, long-term observational studies of nutrition and health, says Shay. “Now we’re going back and looking at the data we have” to see if adverse health effects correlate with HFCS consumption. “The older observational data are gold mines” for further testing of some new hypotheses about the effects of sugar, Shay says.

Such analyses, along with “gold-standard” randomized control trials and laboratory studies of cellular mechanisms involved in sugar metabolism, will be needed to develop solid answers, scientists say.

It’s difficult — and expensive — to get solid answers from nutrition research, says Kaiser of the University of Alabama. To truly verify what people have eaten, for example, it’s usually necessary to confine them in a research center, a pricey proposition that makes it hard to get study volunteers, she says. Otherwise, ordered not to drink a sugar-sweetened beverage, “they may decide they need a Snickers bar” instead, without telling researchers, she says.

Another avenue of current study involves the possible relationship between glucose and cancer-cell growth. All human cells, including tumor cells, use the simple sugar glucose as their primary fuel. Nearly a third of some common cancers — including breast and colon cancers — have so-called insulin receptors on their surface, according to Lewis Cantley, head of the Cancer Center at Weill Cornell Medical College in New York City, who hopes to find a drug that can cut off cancer cells’ glucose supply. Insulin binds to these receptors and signals the tumor to start consuming glucose.

The role, if any, of dietary sugar in cancer development is unknown. However, some scientists studying the question offer the same dietary advice as many others who study the health effects of sugars: Consume them with care.

“I have eliminated refined sugar from my diet and eat as little as I possibly can,” said Craig Thompson, president of Memorial Sloan-Kettering Cancer Center in New York, who has also studied the insulin-tumor link. “I believe, ultimately, it’s something I can do to decrease my risk of cancer.”

Studying Sugar

No one doubts that if people consume more calories than they burn, they’ll gain weight and potentially could develop diseases such as Type 2 diabetes. The jury is still out, however, on whether calories from sugar are more to blame than other calories, and new research is beginning to test that proposition.

Earlier this month, the National Institutes of Health convened experts to begin designing a research agenda for determining how the body digests and uses fructose and whether the process has negative health effects.

“Taking in too much energy” — calories — “that is not burned off at the end of the day” is a known risk factor for heart disease, but some recent research suggests that calories from sugar may increase the risk even more, says Christina M. Shay, an assistant professor of biostatistics and epidemiology at the University of Oklahoma College of Public Health in Oklahoma City.

## OUTLOOK

### Focusing on Sugar

Many scientists caution that more rigorous research is needed in order to conclude that sugars are — or aren’t — the key to cutting obesity and reducing disease risk. Others, however, argue that, since added sugars don’t actually add nutrients to anyone’s diet and excess calories clearly are a problem, governments are justified in adopting public-health efforts to restrict added-sugar consumption.

Purdue’s Mattei contends that rigorous studies must be conducted before concluding that restricting sugar is the key to conquering obesity. Without solid research, later science could end up debunking the link between sugar and adverse health effects, he says.

And reporters and policymakers should be careful not to over-interpret early studies, says the University of
Alabama’s Kaiser. “Statistics are only the arbiter of proof” when they are validated by additional studies, she says. One study — no matter how strong and impressive it seems — “does not an answer make.”

Some analysts predict that policies to discourage overconsumption of sugar-sweetened beverages will move ahead anyway. “We’ll see a lot of movement” toward new taxes on sugar-sweetened drinks, says Johns Hopkins’ Bleich, adding that soda taxes could be “a huge revenue generator” for cash-strapped states.

But Ludwig of Boston Children’s Hospital believes progress by states and local governments in limiting sugary drinks in schools or raising soda taxes will be slow because “the industry has a lot of influence.” Nevertheless, evidence is accumulating that limiting consumption of sugar-sweetened beverages helps curb obesity. “Ultimately, the truth does prevail” in such matters, he says. “The question is, How much delay will there be?”

One “obvious place to begin,” he says, would be to remove sugar-sweetened beverages from items that can be purchased with food stamps. “We estimate that about $4 billion in taxpayer money is being used to buy sugary beverages” for food stamp recipients, he says. As a result, “the public is likely to pay twice” when obesity-related health problems occur in those populations, because Medicaid and Medicare end up paying for many of those costs, Ludwig says.

In any event, some voluntary industry actions will soon take effect. The American Beverage Association, for example, has promised to provide healthier beverages at schools, says the University of Illinois’ Taber.

Replacing low-fiber, sugary, processed foods with high-fiber, low-sugar foods such as fresh vegetables, fruits and grass-fed beef is already feasible, said Lustig. “Years ago we couldn’t [make that switch] because we didn’t have the distribution system to be able to do it. We have it now,” he said. 80

But food sales are a major economic engine, and for the government to admit that it’s pushing the food system in a new direction because the older one wasn’t very healthy would have serious repercussions for international sales, Lustig says.

“The question is, When does health finally win out?” asks Lustig. “When is the tipping point?”

Notes

2 Quoted in ibid.
12 Ibid.
21 “The Obesity Epidemic,” op. cit.
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26 Ibid.
28 Ibid.
29 Quoted in Butterworth, op. cit.
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45 “Robert Lustig: Transcript,” op. cit.
49 Taubes and Couzens, op. cit., p. 37.
50 Ibid.
57 “Profiling Food Consumption in America,” op. cit.
61 Fletcher, et al., ibid.
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63 “Beverages Sold in Public Schools, Bridging the Gap,” August 2012, www.bridgingthegapresearch.org/_asset/7f02q/BTG_competitive_beverage_brief_final-8-7-12.pdf.

About the Author

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FOR MORE INFORMATION

American Beverage Association, 1101 16th St., N.W., Washington, DC 20036; 202-463-6752; www.ameribev.org. Membership group that promotes the interests of companies that produce non-alcoholic beverages.


Health Policy Center, University of Illinois at Chicago, Institute for Health Research and Policy, (MC 275), Westside Research Office Building, 5th floor, 1747 West Roosevelt Rd., Chicago, IL 60608; 312-996-7222, www.ihrp.uic.edu/center/head-health-policy-center. Studies the effects of policies to limit sugar consumption.

The Obesity Society, 8757 Georgia Ave., Suite 1320, Silver Spring, MD 20910; 301-563-6526; www.obesity.org. Membership group for scientists studying obesity’s causes, treatment and prevention.

Rudd Center for Food Policy and Obesity, Yale University, P.O. Box 208369, New Haven, CT 06520-8369; 203-432-6700; www.yaleruddcenter.org. University-based center that studies and advocates for policy interventions to prevent obesity, improve diets and decrease stigmatization based on weight.

The Skinny on Obesity, UCTV/Youtube/University of California. Documentary series by University of California, San Francisco, pediatric endocrinologist Robert Lustig, who argues that sugar and processed foods are the primary causes of the obesity epidemic.

The Sugar Association, 1300 L St., N.W., Suite 1001, Washington, DC 20005; 202-785-1122; www.sugar.org. Sugar-industry group that promotes sugar as a wholesome dietary component.


American Beverage Association, 1101 16th St., N.W., Washington, DC 20036; 202-463-6752; www.ameribev.org. Membership group that promotes the interests of companies that produce non-alcoholic beverages.


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Books


A research associate at the University of Toronto recounts the history of humanity's quest for a sugary diet, including the role sugar played in the expansion of slavery and Europeans' conquest of lands suitable for growing sugarcane.


A pediatric endocrinologist at the University of California-San Francisco argues that increased consumption of sugars and highly processed foods is the key cause of the rise in obesity and obesity-related diseases.

Articles


New, randomized clinical trial data suggest that sugar-sweetened beverages have played a substantial role in the obesity epidemic.


The keynote session of this year’s annual meeting of the Obesity Society featured a discussion of whether the current science on sugar’s relationship to obesity is strong enough to justify policy actions such as taxes and restrictions on sugar consumption.


Health-policy analysts at the RAND Corp. think tank (Cohen) and the University of California, Los Angeles, (Babey) argue that public-health agencies should consider restricting the marketing of sugary foods in order to curb impulse buying of unhealthy products.


A University of Washington nutrition researcher discusses the evolutionary history of humans’ sugar consumption and what it suggests about the findings of recent research on sugar and obesity.


As early as the 1970s, some scientists and policymakers favored policies to encourage lower sugar consumption, but the industry’s economic clout made governments reluctant to act. That may be changing as the health and financial burdens of obesity rise, however.

Reports and Studies


Obesity-prevention efforts are increasing in the United States, especially for children and teens, according to a foundation-funded group that promotes disease prevention. If rising obesity trends are not slowed, coronary heart disease, Type 2 diabetes and stroke rates could jump tenfold by 2020, the group says.


An analyst for a corporation-founded think tank that favors a flat, simple tax structure and low tax rates recounts the history of taxes levied on sugar-sweetened food. He argues that increasing such taxes would unfairly burden even people who don’t consume enough sugar to become obese and could lead to unintended consequences, as when tobacco-tax increases led to smuggling.


A focus on high fructose corn syrup consumption and declining exercise has diverted attention from other potential causes of obesity, says a group of medical scholars and statisticians. Contributing causes may include certain infections; a lack of adequate sleep and environmental toxins that lead to hormone imbalances.


Biostatistics and health-policy scholars from New York’s Columbia University and the University of California-San Francisco argue that soda taxes are justified because current beverage prices don’t take into account the costs to society of consuming them.
Artificial Sweeteners


The scientific community disagrees on the safety and long-term health effects of artificial sweeteners.


Coca-Cola and Pepsi are trying to develop a soda with no calories or artificial sweeteners.


Artificial sweeteners may promote long-term weight gain by discouraging people from eating less sweet — but healthier — foods such as fruits and vegetables, says a medical columnist.

Fructose


The Food and Drug Administration has rejected a request from the Corn Refiners Association to change the name of high fructose corn syrup to “corn sugar.”


There is no conclusive evidence that identifies high fructose corn syrup as a primary cause of obesity and diabetes.

Obesity


Regular soda consumption will not increase body weight if other healthy habits are maintained, says a New Jersey nutritionist.


Removing sugary drinks from kids’ diets slows weight gain in overweight teens and reduces the risk that normal-weight children will become obese, studies show.


Sugar is only one cause of obesity, but it is the biggest cause for many people, says a nutrition professor.

Regulation


Brown County, Wis., plans to promote better health through education instead of bans on sugary beverages.


Other cities may follow New York’s lead in limiting the size of sugary beverages.


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