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## Scientists in food fight over soda

**(AP) – Low-fat, low-cal, low-carb. Atkins, South Beach, The Zone. Food fads may be distracting attention from something more insidiously piling on pounds: beverages.**

One of every five calories in the American diet is liquid. The nation's single biggest "food" is soda, and nutrition experts have long demonized it.

Now they are escalating the fight.

In reports to be published in science journals this week, two groups of researchers hope to add evidence to the theory that soda and other sugar-sweetened drinks don't just go hand-in-hand with obesity, but actually cause it. Not that these drinks are the only cause – genetics, exercise and other factors are involved – but that they are one cause, perhaps the leading cause.

A small point? In reality, proving this would be a scientific leap that could help make the case for higher taxes on soda, restrictions on how and where it is sold – maybe even a surgeon general's warning on labels.

"We've done it with cigarettes," said one scientist advocating this, Barry Popkin at the University of North Carolina in Chapel Hill.

Comparing soda and obesity to tobacco and lung cancer is a baseless crusade, industry spokesmen say.

"I think that's laughable," said Richard Adamson, a senior science consultant to the American Beverage Association. Lack of exercise and poor eating habits are far bigger contributors to America's weight woes, he said.

"The science is being stretched," said Adam Drewnowski, director of nutritional sciences at the University of Washington in Seattle. He owns stock in beverage companies and has done extensive research in the field, much of it financed by industry but also some by government.

However, those making the case against soda include some of the nation's top obesity researchers at prestigious institutions like Harvard and Yale.

"There are many different lines of evidence, just like smoking," said Dr. David Ludwig, a Harvard pediatrician who wants a "fat tax" on fast food and drinks.

Beverage companies seem worried. Some are making sodas "healthier" by adding calcium and vitamins, and pushing fortified but sugary sports drinks in schools that ban soda. This could help them duck any regulations aimed at "empty calorie" drinks, said Jennifer Follett, a USDA nutritionist at the University of California in Davis.

"Even defining 'milk' is getting tough these days," with so many flavored varieties and sweetened liquid yogurts, she complained. "It tastes like you're sucking on ice cream."

Proving that something causes disease is not easy. It took decades with tobacco, asbestos and other substances now known to cause cancer, and met strong industry opposition. It would be especially tough for a disease as complex as obesity.

Diet is hard to study. Most people drink at least some sweetened beverages and also get calories from other drinks like milk and orange juice, diluting the strength of any observations about excess weight from soda alone.

Children are growing and gaining weight naturally, "so we have this added complication" of trying to determine how much extra gain is due to sweet-drink consumption, said Alison Field, a nutrition expert at Harvard-affiliated Children's Hospital in Boston.

"Given these caveats, it's amazing the association we do see," she said.

She was among hundreds of scientists who packed a "mock trial" of such drinks at a conference of the Obesity Society last year in Vancouver, British Columbia.

Here is the "food police" indictment of soda and its sugar -sweetened co-conspirators. You be the judge:

- **Count One: Guilt by association.**

Soft drink consumption rose more than 60 percent among adults and more than doubled in kids from 1977-97. The prevalence of obesity roughly doubled in that time. Scientists say these parallel trends are one criterion for proving cause-and-effect.

Numerous studies link sugary drink consumption with weight gain or obesity. One by Ludwig of 548 Massachusetts schoolchildren found that for each additional sweet drink consumed per day, the odds of obesity increased 60 percent.

Another at Harvard of 51,603 nurses compared two periods, 1991-95 and 1995-99, and found that women whose soda drinking increased had bigger rises in body-mass index than those who drank less or the same.

- **Count Two: Physical evidence.**

Biologically, the calories from sugar -sweetened beverages are fundamentally different in the body than those from food.

The main sweetener in soda – high-fructose corn syrup – can increase fats in the blood called triglycerides, which raises the risk of heart problems, diabetes and other health woes.

This sweetener also doesn't spur production of insulin to make the body "process" calories, nor does it spur leptin, a substance that tamps down appetite, as other carbohydrates do, explained Dr. George Bray of the Pennington Biomedical Research Center in Baton Rouge, Louisiana.

"There's a lack of fullness or satiety. The brain just seems to add it on," said Dr. Louis Aronne, a Weill-Cornell Medical College doctor who is president of the Obesity Society.

Two studies by Penn State nutritionist Barbara Rolls illustrate this. One gave 14 men lemonade, diet lemonade, water or no drink and then allowed them to eat as much as they wanted at lunch. Food intake didn't vary, no matter what they drank.

The second study gave 44 women water, diet soda, regular soda, orange juice, milk or no drink before lunch. Total intake was 104 calories greater for those given caloric beverages than those given diet soda, water or no beverage. Caloric drinks didn't help women feel any fuller either.

Then there is the "jelly bean study." Purdue University researchers gave 15 men and women 450 calories a day of either soda or jelly beans for a month, then switched them for the next month and kept track of total consumption. Candy eaters ate less food to compensate for the extra calories. Soda drinkers did not.

- **Count Three: Bad influence on others.**

Sugar-sweetened beverages affect the intake of other foods, such as lowering milk consumption. Popkin contends they also may be psychological triggers of poor eating habits and cravings for fast food.

He examined dietary patterns of 9,500 American adults in a federal study from 1999-2002. Those who drank

healthier beverages – water, low-fat milk, unsweetened coffee or tea – were more likely to eat vegetables and less likely to eat fast food.

Conversely, "fast-food consumption was doubled if they were high soda consumers and vegetable consumption was halved," he said.

Harvard epidemiologist Eric Rimm saw a similar effect in a different federally funded study of more than 5,000 young adults. With high soda consumption, "you see this pattern of less healthy intake across the board," he said at the obesity meeting.

- **Count Four: Consistency of evidence.**

Many studies of different types link sugary drinks and weight gain or obesity. Some even show a "dose-response" relationship – as consumption rises, so does weight.

Collectively, they meet many criteria for proving cause and effect, Dr. William Dietz, director of nutrition at the federal Centers for Disease Control and Prevention wrote in an editorial accompanying a study in February's *Journal of Pediatrics*.

In rebuttal, Adamson, the beverage industry spokesman, sees no such consistency. He cites a 2004 Harvard study of more than 10,000 children and teens. Consumption of sugar-added beverages was tied to body-mass index gain in boys but not girls, a gender difference that warrants a "jaundiced eye" to claims that soda is at fault, he said.

He also points to a Harvard study finding no link between weight changes and soda consumption among 1,345 North Dakota children ages 2 to 5 – a group that arguably drinks far less soda than teens and adults.

"Whatever association there is doesn't seem to be large," said Richard Forshee, deputy director of the Center for Food, Nutrition and Agriculture Policy at the University of Maryland who has received research funding from the beverage industry and global sugar producers.

As for soda being linked to poor eating patterns, "you don't know which is cause and which is effect," Drewnowski said.

People who consume lots of fresh-squeezed juice, vegetables and fruits are fundamentally not the same as those who subsist on colas and bologna sandwiches, he contends.

"There is a difference: The first group is rich," Drewnowski said. He thinks government subsidies of fruits and vegetables would be better public policy than taxing a cheap source of calories.

He also disputes the claim that soda calories are not satisfying. He did a study in which 32 men and women were given either colas or fat-free Raspberry Newtons before lunch on four separate occasions.

"There was absolutely no difference in satiety" as measured by how much they ate or how hungry they said they were, he said.

That research was paid for by industry, a factor that can affect study outcomes, said Kelly Brownell, a psychologist and food policy researcher at Yale University and a vocal advocate for curbs on soda and fast food.

When you look at studies according to who footed the bill, "the literature parts like Moses parting the ocean," he said, referring to the biblical parting of the Red Sea.

Does the evidence add up to a conviction of soda?

One of the nation's leading epidemiologists who has no firm stake in the debate, the American Cancer Society's Dr. Michael Thun, thinks it does.

"Caloric imbalance causes obesity, so in the sense that any one part of the diet is contributing excess calories, it's contributing causally to the obesity," Thun said. "It doesn't mean that something is the only cause. It means that in

the absence of that factor there would be less of that condition."

Does it merit a warning on soda cans?

"I think it would be a good candidate for a warning," Thun said. "It's something that should be seriously considered."

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