Planet-saving diets, p.5

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Wellness Letter

News and expert advice from the School of Public Health

Sugar: the bitter truth

It's not just making us fat, it may be making us sick

Sugar keeps making headlines because of accumulating research on its known and potential risks, as well as new calls from government agencies and health organizations for us to cut down on it. Is sugar even worse than saturated or trans fat or sodium, as some nutrition experts and news reports claim? That's difficult to say, but sugar is definitely a major concern, primarily because we're consuming so much more of it than we used to. In the past, worries were confined to its increasing the risk of diabetes and obesity and its causing cavities, but now research has also linked sugar to heart disease, hypertension, strokes, gout, periodontal disease, fatty liver disease, and a host of other health problems.

"We are in the midst of a paradigm shift in research on the health effects of sugar, one fueled by extremely high rates of added sugar overconsumption," as Laura Schmidt, Ph.D., professor of Health Policy at UC San Francisco, put it in a commentary in *JAMA Internal Medicine* last year. "Too much sugar does not just make us fat; it can also make us sick."

These concerns pertain to the huge amounts of added sugar we're consuming, not the sugar naturally found in foods such as fruit and dairy products. That added sugar is overwhelmingly sucrose (white table sugar) or high-fructose corn syrup, which are liberally added to as much as three-quarters of all packaged foods and beverages in the U.S.—not only "sweets" like candies and cookies, but also staples like breakfast cereal, pasta sauce, ketchup, baked beans, sweetened yogurt, bread, and soups. Added sugars also include honey, molasses, coconut palm sugar, agave (see page 7), evaporated cane juice, and fruit juice concentrate, which sound healthier but are basically just sugar.

It's theorized that large intakes of added sugar have adverse effects in the body via multiple pathways—notably by increasing inflammation, oxidative stress, and triglycerides (fats in the blood), impairing insulin regulation, and raising blood pressure.

A sprinkling of recent research

■ **Cardiovascular disease.** In an important study in *JAMA Internal Medicine* in 2014, researchers analyzed national data from the past 20 years and found that the 10 percent of people who consumed the most added sugar (25 percent or more of daily calories) were almost three times more likely to die from cardiovascular disease than those consuming the least (less than 10 percent of daily calories), while those with intermediate sugar consumption had a one-third higher risk, on average. Elevated risk was seen regardless of body weight, physical activity level, age, sex, race/ethnicity, overall diet quality, and many other factors.

■ **Stroke.** In a large Swedish study in the *Journal of Nutrition* in 2014, which followed 68,000 healthy people (ages 45 to 83) for a decade, those drinking at least two cups of sugary beverages a day were about 20 percent more likely to suffer a stroke than those who rarely drank them.

■ **Hypertension.** In a 2014 analysis of data from 12 clinical trials, published in the *American Journal of Clinical Nutrition*, New Zealand researchers found that relatively high sugar intakes increased blood pressure

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QUESTIONS

1. Name 8 areas of "recent research" about sugar.

2. You needn't worry about foods naturally containing sugar, such as fruit or milk.

____ true ____ false

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by 6 to 8 points, on average. In fact, added sugar probably contributes more to hypertension than sodium does, concluded a 2014 review paper in the journal *Open Heart.*

■ **Blood cholesterol and triglycerides.** In a clinical trial in the *American Journal of Clinical Nutrition* in June, researchers from UC Davis found that sugary beverages (containing high-fructose corn syrup) significantly raised LDL ("bad") cholesterol, triglycerides, and related risk factors in the blood of young adults in just two weeks. The participants were divided into four groups so that the beverages supplied various proportions of their daily calories—low (10 percent), medium (17.5 percent), or high (25 percent), compared to a control group that drank artificially sweetened soft drinks. The more sugar they consumed from the beverages, the worse the effects on their risk factors. The high-sugar group had particularly dramatic increases—their LDL rose by 16 points and triglycerides by 37 points.

The previously mentioned New Zealand analysis pooled data from 37 other trials and also concluded that high sugar intake raises LDL cholesterol and triglycerides, independent of its effect on body weight.

■ **Diabetes.** A review in *Mayo Clinic Proceedings* in March confirmed that added sugar, especially fructose, is a "principal driver" of the epidemic of type 2 diabetes, as a result of its contribution to metabolic problems and ultimately insulin resistance. Table sugar (sucrose) is half fructose (and half glucose), while high-fructose corn syrup is usually 55 to 65 percent fructose. The authors noted that whole foods containing fructose, such as fruits, pose no problem for health and are linked to *reduced* diabetes risk.

■ **Obesity-related deaths.** Sugary beverages are associated with more than 180,000 obesity-related deaths worldwide each year, according to a Harvard study published this year. About 25,000 of those deaths occur in the U.S. Three-quarters of them are caused by diabetes, the rest by cardiovascular disease and some cancers. The researchers used data from the 2010 Global Burden of Disease Study, which focused on the health and mortality rates of more than 100 countries, and adjusted them for other factors that affect weight.

■ **Shortened telomeres.** In a study in the *American Journal of Public Health* last December, researchers from UC Berkeley, UC San Francisco, and other institutions analyzed data from national surveys and found that sugary beverages were associated with shortened telomere length. Telomeres are caps on the ends of DNA strands (chromosomes) that help protect them from damage as cells repeatedly divide. Having a high percentage of short telomeres has been linked to cancer, cardiovascular disease, and certain other age-related disorders. For more on telomeres, see tinyurl.com/telomeresWL.

■ **Early menarche (first menses).** In a study in *Human Reproduction* earlier this year, Harvard researchers found that among girls ages 9 to 14, those who drank sugary soft drinks often (at least 18 ounces a day) had their first period nearly three months earlier than girls who rarely consumed the drinks. Fruit juice was not associated with early menarche. The Harvard researchers controlled for body weight, calorie intake, exercise level, and other factors that could play a role. Early menarche is a health concern in part because it is associated with an increased risk of breast and endometrial cancer later in life.

22 teaspoons a day!

A few centuries ago, most people consumed only a few pounds of concentrated sugars a year. Though estimates vary, Americans today average at least 75 pounds of added sugar annually—that's one-fifth pound a day (about 22 teaspoons), which provides 350 "empty" calories. Nearly half of that sugar comes from sweetened beverages (including coffee and tea); one 16-ounce bottle of soda has about 11 teaspoons of sugar.

As we reported a few months ago, the new proposed Dietary Guidelines for Americans recommend a limit on sugar for the first time: no more than 10 percent of a person's daily calories should come from added sugar. That amounts to about 12 teaspoons (50 grams) for someone consuming 2,000 calories a day (1 teaspoon contains about 4 grams of sugar).

The 10 percent limit matches the new one from the World Health Organization, which advises, however, that getting less than 5 percent of daily calories from added sugar (about 6 teaspoons and 100 calories on a 2,000-calorie daily diet) is an even better goal. The latter is similar to the strict recommendations from the American Heart Association: no more than 6 teaspoons of added sugar a day for most women and 9 teaspoons for most men.

Words to the wise

It's clear that added sugar is a problem for many Americans. But what matters most are the context and quantities. Excessive sugar intake is usually a marker for a diet heavy in processed foods and high in calories, saturated fat, and sodium. But research now indicates that it boosts risk independently of overall diet.

If you eat mostly whole foods (as opposed to processed foods) and rarely consume sugary soft drinks, you may well be getting less than 10 percent (or even 5 percent) of your daily calories from added sugar. Some simple steps can help reduce sugar intake, such as limiting your consumption of sugar-laden yogurt (add your own fruit to plain yogurt) and choosing breakfast cereals with little or no sugar. Still, if you are generally careful and the rest of your diet is healthful, consuming small amounts of added sugar is unlikely to be harmful.

You needn't worry about foods naturally containing sugar, such as fruit (though fruit juice should be limited) or milk. One frustrating thing about nutrition labels is that they don't differentiate between naturally occurring and added sugars. The line for "sugars" under "total carbohydrates" in the Nutrition Facts box lumps them together. For many foods, that's pretty useless. How would you know that about half of the 24 grams of sugar in 4 ounces of commercial sweetened applesauce has been added? Or that half the 25 grams of sugar in your healthy-looking 6-ounce low-fat vanilla yogurt has been added (that's three extra teaspoons of sugar).

Limiting added sugar will be easier to do in the future, since food companies will have to list it separately on the FDA's new nutrition labels, which were proposed in 2014 but won't go into effect for a couple of years.

Societal intervention is also needed, beyond new recommendations to limit added sugar (see box at left). States and localities should follow the city of Berkeley's lead and tax sugar-sweetened beverages, which are by far the largest source of added sugar in the American diet. What's more, some public health experts have called for the FDA to remove sugar from its "generally recognized as safe" list of ingredients. That would prevent food companies from adding unlimited amounts of sugar to their products.