

Stevia

Sweet...but How Safe?

BY DAVID SCHARDT

This is a potential game-changer among zero-calorie sweeteners,” said Lou Imbrogno, senior vice president of Pepsi Worldwide Technical Operations, in a press release in July.

Stevia may be natural—unlike the other major non-caloric sweeteners. But is it safe...and does it taste like sugar?

Keep Off the GRAS?

For centuries, stevia leaves have been used in South America to sweeten beverages. And its extracts are used to sweeten foods in Brazil, Paraguay, Japan, Korea, and China. But in the United States, stevia can be sold only as a dietary supplement. The reason: nagging safety concerns.

This summer, though, several companies told the Food and Drug Administration that they consider highly purified extracts of stevia to be GRAS—Generally Recognized As Safe. (If an ingredient is GRAS, it isn't considered a food additive and can be used without prior FDA approval.)

But they may have jumped the gun, according to a review prepared for the Center for Science in the Public Interest (publisher of *Nutrition Action*) by toxicologists at the University of California, Los Angeles.

These are the major stevia sweeteners that are being rushed to market:

■ **Truvia** (from Coca-Cola and agricultural behemoth Cargill). Cargill is rolling out Truvia as a tabletop sweetener. Coca-Cola has plans to use it in soft drinks.

■ **PureVia** (from Pepsi-Cola and Whole Earth Sweetener Co.—a subsidiary of the company that manufactures the Equal brand of aspartame). Whole Earth plans to start selling PureVia as a tabletop sweetener this fall. PureVia-sweetened Pepsi drinks will come later.

■ **SweetLeaf**. Wisdom Natural Brands started selling SweetLeaf sweetener in June.

Cargill and Whole Earth Sweetener have asked the FDA to review the safety evidence before Coke and Pepsi start adding stevia extracts to diet drinks.

That's good news, because the UCLA toxicologists are concerned about whether stevia extracts could cause cancer.

DNA Damage & Cancer

The two main sweet-tasting components of stevia are rebaudioside A and stevioside. Two of the new stevia extracts—Coke's Truvia and Pepsi's PureVia—are more than 95 percent rebaudioside A. (Wisdom Natural Brands won't disclose what's in SweetLeaf.)

Rebaudioside A and stevioside are so closely related that any damaging evidence for either one casts doubt on the safety of the other.

The UCLA toxicologists' first concern: In some test tube and animal studies, stevioside (but not rebaudioside A) caused mutations, chromosome damage, or DNA breakage.

For example, when Brazilian researchers added stevioside to the drinking water of lab rats, the investigators found DNA breakages in cells in the animals' blood, liver, spleen, and brain.¹

If a chemical causes DNA damage, the second question is whether it causes cancer. It's reassuring that in two studies that fed stevioside to rats for two years (most of their lives), tumors didn't increase.² But no one has fed rebaudioside A to rats to see if it causes tumors.

What's more, substances can cause cancer in one animal and not another, so the FDA recommends testing compounds like stevia—which could be ingested at high levels by a huge number of people—in two species (typically rats and mice). But no one has published studies looking at whether rebaudioside A or stevioside causes cancer in mice.

“Rebaudioside A is likely to be consumed

by tens of millions of people, and needs to be tested in two rodent species in lifetime carcinogenicity studies before it can be accepted as generally recognized as safe,” says Curtis Eckhart, a professor of molecular toxicology at UCLA. He and graduate student Sarah Kobylewski co-authored the review commissioned by CSPI.

Fertility & Blood Sugar

While the UCLA toxicologists questioned whether stevia is ready for prime time, new research has apparently put to rest earlier worries that the sweetener could impair fertility or affect blood sugar levels.

In a study sponsored by Cargill, “we found no reproductive problems through two generations of rats fed very large doses of rebaudioside A,” says the company's director of regulatory and scientific affairs.³

Another Cargill-funded study fed 122 people with type 2 diabetes 1,000 mg a day of rebaudioside A—two to seven times the estimated amount they might consume. After 16 weeks, a long-term measure of their blood glucose levels didn't change.⁴

The UCLA toxicologists didn't question the results of either study.

Sweet Nothings

Will stevia join these major no-calorie sugar substitutes?

- **Acesulfame-potassium**. Tests conducted in the 1970s—one of which suggested an increased cancer risk in female rats—were of mediocre quality.
- **Aspartame (NutraSweet, Equal)**. Judging by the results of two recent rat studies, it may slightly increase cancer risk.
- **Saccharin (Sweet'N Low)**. In animal studies, it has caused cancer of the urinary bladder, uterus, ovaries, skin, blood vessels, and other organs.
- **Sucralose (Splenda)**. It appears to be safe, but may not appeal to people who want a “natural” sweetener. Sucralose is made by chlorinating sugar molecules.

The Bottom Line

Using stevia occasionally—to sweeten a cup of tea, for example—is probably safe. (Taste is another matter. Some of our testers thought Truvia tasted like sugar. Others found it bitter.)

But if Coke and Pepsi add stevia to their diet drinks, millions of people would be exposed to large amounts of the sweetener.

Until companies (or, better yet, an independent authority like the federal government's National Toxicology Program) do more testing, there's no way to tell whether that would increase the risk of cancer. 🍌

¹ *Food Chem. Toxicol.* 45: 662, 2007.

² *Food Chem. Toxicol.* 46: S1, 2008.

³ *Food Chem. Toxicol.* 46: S21, 2008.

⁴ *Food Chem. Toxicol.* 46: S47, 2008.



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