

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?

Jumping the Sweet Gun

Stevia extracts are used to sweeten foods in Brazil, Paraguay, Japan, Korea, and China. But in Canada and the United States, stevia can be sold only as a dietary supplement or (in Canada) as a sweetener or "medicinal ingredient" in natural health products. Why can't companies add it to foods? Naging safety concerns.

This summer, though, several U.S. companies told the U.S. Food and Drug Administration (FDA) that they consider highly purified extracts of stevia to be safe enough to use in foods without prior approval.

But they may have jumped the gun, according to a review prepared for the Centre 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 in the United States:

- **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.

There are no immediate plans to market the sweeteners in Canada. And Cargill and Whole Earth Sweetener have asked the U.S. FDA to review the safety evidence before Coke and Pepsi start adding stevia extracts to diet drinks in the United States.

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

DNA Damage & Cancer

The main sweet-tasting components of stevia are rebaudioside A and stevioside. The two major new stevia extracts—Coke's Truvia and Pepsi's PureVia—are more than 95 per cent rebaudioside A. Rebaudioside A and stevioside are so closely related that any damaging evidence for 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), tumours didn't increase.² But no one has fed rebaudioside A to rats to see if it causes tumours.

What's more, substances can cause cancer in one animal and not another, so U.S. FDA guidelines recommend testing compounds like stevia—which could be ingested 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 ac-

cepted as generally recognized as safe," says UCLA toxicologist Curtis Eckhert, who co-authored the study 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.

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.)

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.
- **Cyclamate (Sweet'N Low, Sugar Twin).** It may increase the potency of carcinogens. Cyclamate packets warn people to use the sweetener "only on the advice of a physician."
- **Saccharin (Hermesetas).** 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.

But if Coke and Pepsi add stevia to their diet drinks in the United States, millions of people would be exposed to large amounts of the sweetener. Until companies (or, better yet, an independent authority like Health Canada's Toxicology Research Division or the U.S. 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.



More on the Web

www.nutritionaction.org/stevia