

SUCRALOSE: A SAFE SWEETENER FOR THE ENTIRE FAMILY

Dr. Madhavi R. Redkar MD (Pharmac), Consultant Pharmacologist

Non-nutritive sweeteners are intensely sweet substances, which are essentially synthetically manufactured. Aspartame, saccharin, acesulfame potassium and sucralose are the main non-caloric sweeteners available in the international market today.

Sucralose is the only non-caloric sweetener made from sugar. It is in fact the latest non nutritive sweetener to have been approved by US FDA and other regulatory bodies and have hit the markets .

Sucralose is derived from sugar through a multi-step patented manufacturing process that selectively substitutes three atoms of chlorine for three hydroxyl groups on the sugar molecule. This change produces a sweetener that has no calories, yet is 600 times sweeter than sucrose, making it roughly twice as sweet as saccharin and four times as sweet as aspartame.



Sucralose tastes like exceptional stabilizer, including cooking and baking.

perceptible manufacturers and consumers to use it virtually anywhere, where sugar is used, have an unpleasant after-taste. The

HISTORY:

Sucralose was discovered in 1976 by scientist Leslie Hough and a young Indian chemist, Shashikant Phadnis at Queen Elizabeth College (now part of King's College, London). The duo was trying to make an insecticide.

Phadnis was told to 'test' the powder. Phadnis thought that Leslie asked him to 'taste' it; so he did. He found the compound to be ridiculously sweet (the final formula was 600 times sweeter than sugar. However, they did not find any use of the compound as an insecticide.¹

APPROVAL:

Sucralose has withstood the scrutiny of several national and international food safety regulatory bodies. It was first approved for use in Canada in 1991. As of 2006, it has been approved in over 60 countries.

Sucralose was granted approval by the U.S. Food and Drug Administration (US FDA) on April 1 1998 and approved for use in 15 food and beverage categories². This is the broadest initial approval ever granted by FDA for a food ingredient. The FDA expanded the uses for sucralose in 1999, approving it as a "general purpose" sweetener, which removed the limitations of allowing sucralose only in the before mentioned 15 food and beverage categories.

BENEFITS:

- **Tastes Like Sugar** —In scientific taste tests conducted by independent research organizations, sucralose was found to have a taste profile very similar to sugar and has no unpleasant after-taste.
- **Can Help Control Caloric Intake** — Sucralose is not metabolized in human body, thus it has no calories. It passes rapidly through the body virtually unchanged and does not accumulate in any organ or tissue. By replacing sucralose for sugar in foods and beverages, calories can be reduced substantially, or, in many products, practically eliminated.³
- **Safe for The Entire Family** - It can be used by all populations, including women of childbearing age, pregnant women, nursing mothers, and children of all ages. **No population subgroup has been excluded from using sucralose.**
- **Safe for PKU** -Since it does not contain phenylalanine, sucralose is safe for consumption by phenylketonuric (PKU) populations [a small subset of population with a genetic inborn error of metabolism where they are unable to metabolize amino acid phenylalanine.]
- **Advantageous for People with Diabetes** — Sucralose is not recognized as sugar or a carbohydrate by the body. Thus, it has no effect on glucose utilization, carbohydrate metabolism, and the secretion of insulin, or glucose and fructose absorption. Studies in persons with normal blood glucose levels and in persons with either type 1 or type 2 diabetes have confirmed that sucralose has no effect on short- or long-term blood glucose control⁴
- **Does Not Promote Tooth Decay** The US FDA has recently announced the authorization of the use of a health claim regarding the association between sucralose and non-promotion of dental caries⁵
- **Extraordinary Heat Stability** — Sucralose is exceptionally heat stable, making it ideal for use in baking, canning, pasteurization, aseptic processing and other manufacturing processes that require high temperatures required in the Indian way of cooking. No other sweetener earlier has offered this advantage.

- **Long Shelf Life** — Sucralose combines the taste of sugar with the heat, liquid and storage stability required for use in all types of foods and beverages. It is particularly stable in acidic products, such as carbonated soft drinks, and in other liquid based products (e.g., sauces, jelly, milk products, processed fruit drinks). Sucralose is also very stable in dry applications such as powdered beverages, instant desserts, and tabletop sweeteners.
- **Ingredient Compatibility** — Sucralose has excellent solubility characteristics for use in food and beverage manufacturing and it is highly compatible with commonly used food ingredients, including flavors, seasonings, and preservatives.

SAFETY:

Several national and international food safety regulatory bodies have accepted Sucralose, including the U.S. Food and Drug Administration (FDA), Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives, The European Union's Scientific Committee on Food, Health Protection Branch of Health and Welfare Canada and Food Standards Australia-New Zealand (FSANZ).

The safety of sucralose is documented by one of the most extensive and thorough safety testing programs ever conducted on a new food additive. More than 100 studies conducted and evaluated over a 20-year period clearly demonstrate the safety of sucralose. Studies were conducted in a broad range of areas to assess whether there were any safety risks regarding cancer, genetic effects, reproduction and fertility, birth defects, immunology, the central nervous system, and metabolism.^{2,3,6,}

FUTURE

People are demanding a greater variety of low-calorie products as they strive to make healthier food choices. Sucralose can help meet this demand because its combination of sugar-like taste and excellent stability make it uniquely suited for numerous products, many of which have been previously unavailable in a reduced calorie, reduced sugar form.

Earlier due to absence of any alternatives people had to accept the unpleasant aftertaste as in case of aspartame and saccharine. Today sucralose is changing the choices of the masses. Not only do diabetic patients have a better alternative to add sweetness to their lives but also the suitability of sucralose to all subsets of population including the young and old has made sucralose the success it is today. Thus, Sucralose is proving to be a safe boon for the entire calorie conscious family.

References:

1. Burkhard Bilger, The New Yorker, May 22, 2006, p 40
2. FDA Talk Paper T 98 –16 1998.
3. Everything You Need to Know About Sucralose, International Food Information Council, June 2004
4. Food and Drug Administration CFR Part 172 Docket No. 87F-0086
5. Federal Register Vol 71, No 60 March 29 2006 Rules and Regulations Page 15559-15564
6. Low calorie sweeteners- Sucralose <http://www.caloriecontrol.org/sucralos.html> 11 Jan 2006
