



# Newsletter

**Our Mission:** To provide the highest quality nutritional supplements available, teach of their value, and help our customers integrate them into a lifestyle of real, minimally processed foods, and intelligent exercise; so that they may live closer to their full human potential.

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## Sucralose Q&A Setting the Record Straight

### Part 1

Due in large part to an overwhelmingly effective marketing campaign, sucralose is almost universally recognized as the only calorie-free sweetener which is “made from sugar.” As one of the most successful product launches in history, sucralose has quickly come to hold over 60% of the US artificial sweetener market and can currently be found in over 4,500 consumer products including many nutritional supplements.

But even in the face of widespread acceptance, the sweetener has found itself increasingly under attack from various health experts and consumer groups who question not only the marketing tactics of its promoters, but the safety of the compound itself.

In this Q&A series on sucralose we at Integrated Supplements aim to help you see through both the marketing hype and alarmist propaganda which often surrounds that mysterious ingredient in those little yellow packets. We’ll give you the answers you need to help you make the most informed decision possible regarding this controversial artificial sweetener.

## The Taste of Sweet – Getting our Fix

As with so many of life’s pleasures, when it comes to our attraction to sweet foods, the evolutionary deck seems to be stacked against us. Researchers have found that the human craving for sweets is hardwired into our brains at birth, and that infants given sugar exhibit the same opiate-like brainwave patterns as when given pacifiers or hugs, except

for one thing – the effects of sugar last longer.

So, from a strictly physiological perspective, it’s no wonder that we’ve become a civilization largely powerless to resist the captivating allure of sweet foods. Like addictive drugs, the taste of sweet triggers the pleasure centers deep in our ancestral brain; it affects not only our physical body, but the depths of our emotional selves as well, keeping us perpetually coming back to get our “fix.” Sugar could alternately

be called nature’s first “comfort food” or mind-altering drug.

Yet for primitive man, in a time when sugar and sweet foods were a rare luxury, triggering of the sweet receptor on the

tongue was an asset to survival. It signified that a food was a rich source of valuable calories - not a poison, and testament to the efficiency of human engineering, our taste receptors seem to have evolved in an environment where sugar was so scarce that Mother Nature may not have deemed in necessary to equip our sugar craving machinery with a shut-off switch.

Over the centuries however our access to sugar, especially of the nutrient-poor refined variety, has become for all intents and purposes limitless, and with frightening consequences for public health, our consumption of sugar continues to climb steadily with no upper limit in

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sight.

Statistics for 2005 estimate that the average American eats approximately 150 pounds of sugar per person per year, but



even this astronomical amount can't satisfy our insatiable craving for sweets. As our tolerance continues to spiral upwards, it seems that sugars have become only *one* of the sweet compounds which we are addicted to. In recent decades the advent of chemically synthesized artificial sweeteners, often many hundreds of times sweeter than sugar, have afforded us the opportunity to really see if our appetite for sweetness can ever be satiated.

But if the statistics are correct, it doesn't seem as if artificial sweeteners have done anything except put our national sweet tooth into overdrive. Somewhat ironically, since the introduction of artificial sweeteners decades ago, our consumption of sugar *and* overall calories have both *increased significantly*.

And not only may artificial sweeteners dramatically increase our cravings for sweets, the question as to whether or not artificial sweeteners are actually safe still remains. Every artificial sweetener form saccharine, to aspartame to the new darling of the artificial sweetener crowd, sucralose has had difficulty shaking the looming suspicion that these chemicals may be the cause of many unexpected and harmful effects on our health.

### **Sucralose – New and Improved, or More of the Same?**

First approved by the FDA for use as a food additive in 1998, sucralose, the newest artificial sweetener on the block has quickly (some would say too quickly) been embraced by the food industry and consumers alike. Perhaps much of the reason for the sweetener's widespread acceptance is that the makers of sucralose-containing products have gone out of their way to assure their customers that their product is "made from sugar," possibly seeking to make the sweetener seem "natural," and therefore safe by downplaying its' ties to other artificial sweeteners.

Yet, technically speaking, Sucralose is



far from a natural substance. Sucralose is a chemically altered sucrose (table sugar) molecule in which three of the hydroxyl groups normally found in sucrose are replaced by chlorine atoms. The resulting chemical is approximately 600 times sweeter than sugar, and is metabolized by the body so as to not yield calories or increase blood sugar.

But natural substance or not, a calorie-free sweetener as versatile as sucralose sounds like a boon to the growing number of people in America and throughout the world concerned with diet-related issues like overweight, obesity, and diabetes. As a result, sucralose sales have grown at a staggering rate and already comprise almost two-thirds of the artificial sweetener market in the United States.

There is no doubt that the American public has eagerly, yet rather unquestioningly embraced sucralose, and products containing it, like the tabletop sweetener in those little yellow packets; yet its meteoric rise to the top of the sweetener heap leads many people to wonder, what exactly is this chemical, how is it produced, and is it safe to ingest in the long-term?

After all, as a chemical with three chlorine-carbon bonds, sucralose belongs to a class of chemicals known as chlorocarbons

or organochlorines, and sucralose's detractors are quick to point out that many chemicals in this class (such as the pesticides DDT and lindane) are known to be *highly* toxic.

And disconcerting to many is the fact that Sucralose was, in fact discovered by chemists who were attempting to create new *pesticides* and NOT by food chemists, a fact that is obviously never touted in the marketing behind the product; and since many organochlorines produce adverse effects at extremely low doses, perhaps an added burden of proof *is* warranted to justify the *INGESTION* of any chemical in this class as a food ingredient.

What testing has been done on sucralose, and by whom? Do long term human studies exist? What did these studies show? Is sucralose dangerous, and what are the risks associated with ingesting sucralose? Surely the FDA would protect us from harmful food additives, wouldn't they?

And aside from its inclusion in diet sodas and tabletop sweeteners, what about sucralose's role in an increasing number of dietary supplements and health products? Does sucralose have a place in nutritional supplement products or foods which are marketed specifically toward the health-conscious consumer?

With so many consumers operating with what could be called a false sense of security with regard to the sweetener, we feel it necessary to answer some of these tough questions and set the record straight on sucralose.

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**Q. According to the US Food and Drug Administration, sucralose was the subject of over 110 human and animal studies before it was approved as a food additive. And to quote from the FDA's official press release on sucralose, "Many of the studies were designed to identify possible toxic effects including carcinogenic, reproductive and neurological effects. No such effects were found, and FDA's approval is based on its finding that sucralose is safe for human consumption."**

**So, isn't it a little paranoid to say that more testing needs to be done on sucralose? No product can ever be proven 100% safe in every respect. What type of safety testing should we be looking for exactly? What are the unanswered questions which still remain with regard to sucralose?**

**A.** To answer these questions properly first requires that we gain a little historical perspective not on sucralose per se, but on the role of the FDA, as well as the political and cultural environment in which we find ourselves and our food supply.

Even in the face of what many consider to be a less-than-stellar track record over the years, the United States FDA has somehow managed to create and maintain an image of itself as an organization dedi-

cated to defending and protecting all aspects of the public health. But to give just one example, the American public would be well served to remember that this is the same organization which for almost a hundred years has allowed (and still allows) the sale of foods containing trans-fatty acid-rich hydrogenated oils. The health-damaging effects of these artificial fats have been established beyond any scientific doubt, and have been well known for decades.

If, in fact, it were the FDA's responsibility to see that only *healthy* foods and food additives were added to the food supply, trans-fat-containing hydrogenated oils would have been banned decades ago. But they obviously haven't been; they can still be found in the majority of fried and processed foods which the people of this nation eat everyday. It has only been within the last two years that the FDA has even required the labeling of trans fats on food packaging, and the recent legal backlash against trans fats in cities like New York, for example, has been driven entirely by consumer groups and local government, NOT by the FDA.

And again, this is just one of the most obvious examples of the FDA's true role in regulating foods, there are certainly many others, but for the sake of our argument, I think it's important to begin by explicitly

stating what many people only suspect implicitly: **It is not the role of the FDA to safeguard our health against every food which could do us harm, so the FDA's approval of food additives like sucralose does not necessarily mean that these compounds are in any way safe in the long term.**

As evidence, a quick glance around your local grocery store or fast food restaurant – remember, *all* of the foods they sell are well within the standards of what the FDA allows - will tell you that it's obviously not the job of the FDA to see that only healthy foods are sold, **it's merely the job of the FDA to see that the foods on the market pose no imminent or immediate risk through toxic contamination.**

While no one would question the detrimental-long term effects of the artery-clogging junk food which is so common in this country, few would argue that the FDA is abdicating its responsibility in allowing these foods to be sold; and yet when food additives like sucralose are approved, people take that as evidence of their long-term safety. This sort of thinking is logically inconsistent to say the least. The fact is that there is a huge difference between foods which pose no immediate risk and foods which are actually healthy, and the bottom line is that it's still up to each of us to choose all of our foods carefully, and not simply defer to the FDA, if we value our long-term health.

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Now remember, as a nutritional supplement company, we at Integrated Supplements certainly hold ourselves to a higher standard nutritionally than the sellers of, donuts, french fries, and soft drinks. The history lesson to take from decades of FDA oversight of our food supply is the realization that simply because a food additive is *allowed* does not mean in any way, shape or form that it should be consumed by those seeking optimal, healthy nutrition. This is exactly the situation we find ourselves in with regard to sucralose.

The common use of sucralose in nutri-

tional supplement products serves to further reinforce the erroneous perception of the sweetener as “healthy” (or at the very least, inert). In reality, it is overwhelming greed and disregard for their customers’ health which causes many nutritional supplement manufacturers to formulate their products with sucralose. How many supplement companies have looked at the research like we have and concluded that there are simply too many unanswered questions regarding the safety of sucralose, and how many of them have been willing to incur additional costs to formulate their products with the highest-quality natural flavors and sweeteners available? Not very many, that’s for sure.

**To put it simply, at Integrated Supplements our standards of quality and safety with regard to the ingredients we put in our products are much higher than that of the FDA, and to us, FDA approval of sucralose means very little.**

As for the 110 studies evaluated by the FDA in its review of sucralose, what the agency doesn’t tell you is that the vast majority of these studies didn’t even assess the toxicity of the sweetener. Of these 110 studies, 84 are available in the published scientific literature for public review. Of these 84 studies only 15 were safety studies and **only 5 of these were safety studies performed on humans.** If that’s not alarming enough, the **longest human toxicity study lasted only 13 weeks** – hardly enough time to fully assess the long-term toxicity of such a chemical.

One reoccurring theme we’ve noticed in our research on sucralose is the rift between what is reported in the media and advertising behind the product, and what the research actually says. Much of the official sucralose “dogma” as promulgated by its marketers is in direct contrast with the findings from the published studies. Additionally disturbing is the fact that much of the advertising behind sucralose seems to be explicitly focused on diverting the consumer’s attention *away* from the truth in what many feel to be a very mis-

leading way.

For example, advertisements for the most popular sucralose-containing consumer product (the one found in those little yellow packets), repeatedly focus on the fact that their product is “made from sugar,” and while this fact is technically true, are they trying to make us believe that sucralose is safer or more natural than it actually is? After all, it’s also equally true to say that sucralose is “made from chlorine,” but neither of these statements tells the whole story.

It makes us wonder, however: if sucralose is as safe as the marketers say it is, why do they feel the need to keep the public in the dark with regard to the facts found in the public studies? We feel that the answer lies, as it so often does, in the manipulation of science to suit financial objectives. To put it another way: the truth is simply bad for business.

Along these lines, it has been estimated that 98% of the studies submitted to the FDA for sucralose approval, were performed and submitted by the producers of the most popular (and lucrative) sucralose product worldwide. With US retail sales of sucralose totaling \$212 million in 2006, even the most unbiased researcher would naturally be tempted to cast the product in a positive light knowing that FDA approval would ultimately be worth billions of dollars to its manufacturers.

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Now, as for the research itself, considering how little research there actually is on sucralose, even the limited number of available studies show some reason for concern.

Some of the more alarming findings from the sucralose toxicity studies include:

- **Reduced growth rate in newborn and adult rats**
- **Decreased red blood cell count in mice**
- **Decreased thyroid hormone (T4) levels in male rats**
- **Abnormal liver cells and enlarged livers in rats**
- **Genotoxicity (DNA damage) to cells of the mouse gastrointestinal tract (this study was one of the few studies on sucralose performed by independent researchers, not the product’s manufacturers).**
- **Shrunken thymus glands in rats (indicative of compromised immune function).**

The immunological, gastrointestinal, and thyroid-related effects of sucralose are especially disconcerting as they mimic many of the known toxic effects of other chlorocarbons.

**Q But isn’t pointing out the fact that sucralose is a chlorocarbon or organochlorine like some pesticides just a scare tactic? A chemical’s structure is just a clue as to its function – it often doesn’t tell the whole story. Isn’t the anti-sucralose crowd looking to deem the sweetener guilty by association with other chlorocarbons?**

**A.** In much the same way some writers wish to deem sucralose guilty by association with organochlorines, the marketers of the most popular sucralose-containing product may very well wish to deem sucralose “innocent” by association with sugar as evidenced by their controversial slogan “made from sugar, so it tastes like sugar,” but as mentioned previously, neither of these associations with the starting



“authority figures”, but so too was its *discovery*).

As one could probably guess, the compound just so happened to be extremely sweet. Phadnis and Hough worked together with British sugar manufacturer Tate & Lyle to create over a hundred chlorinated sugars, eventually settling on the compound we know today as sucralose as the best-suited candidate for inclusion in our food supply. (Note: many people have noted that the very name given to this sweetener, sucralose, is deceptively similar to sucrose, or common table sugar implying more of a relationship between these two compounds than actually exists.)

So, the fact is that chemically speaking, sucralose hangs with some pretty shady characters. Other organochlorines – com-

chemicals of sucralose manufacture can even begin to tell the whole story of this sweetener - they both only serve to confuse the issue.

And while it may certainly be a bit of a stretch to equate sucralose consumption with the ingestion of agricultural chemicals like DDT, it is worth noting that sucralose WAS discovered accidentally by chemists looking to create unique *pesticides*. The compound was even *tested* as a pesticide before it found its way into our food supply. These are facts which, while not explicitly denied by sucralose manufacturers, are certainly not part of their multi-million dollar advertising blitz either. They'd surely prefer that their customers didn't know this information. Once again, the truth isn't terribly good for business, but rather than just blindly trust the sucralose dogma disseminated by the often self-proclaimed authorities, we think that consumers may want to know a little more about the true history behind this strange little sweetener.

In 1975, at the Queen Elizabeth College in London, Shashikant Phadnis, a graduate student working with his advisor, Leslie Hough was attempting to synthesize novel insecticides based upon chlorinated sugar molecules. Although the toxicity of the chemicals with which they were dealing was certainly well known to both of them, puzzlingly, when asked by Hough to *test* the compound, Phadnis misunderstood and responded by *tasting* the compound instead.

(Interesting that not only is the *popularity* of sucralose based upon the blind trust of

In the case of sucralose, we're being asked to **INGEST** a chemically synthesized chlorocarbon as a **FOOD** substance for the first time in history.

pounds containing carbon-chlorine bonds, include a whole host of nasty pesticides, metabolic and environmental toxins, and chemical warfare agents like DDT, PCBs, Phosgene.

And remember, we're not trying sucralose in a court of law here, the compound is not “innocent until proven guilty” - quite the opposite, in fact. Considering the fact that there is no financial incentive to perform independent research on a chemical whose approval has been “rubber stamped” throughout the globe, we may now *never* see the type of studies needed to properly assess the safety of this compound. We need to assess all of the evidence available to us *before* deciding to put this compound into our bodies, including the fact that the

American public has repeatedly been assured of the safety of various food additives and industrial chemicals, only to find years later that these same compounds were indeed harmful.

In the case of sucralose, we're being asked to **INGEST** a chemically-synthesized chlorocarbon (organochlorine) as a **FOOD** substance for the first time in human history, and we're being asked to trust the safety of this compound for widespread use based upon only five human studies, performed by the products' manufacturer no less. And then we're being asked to *ignore* the negative findings of animal studies which produced effects mimicking the toxic effects of other known chlorocarbons. We're being asked to believe, based on the flimsiest of scientific research that for some unknown reason sucralose is fundamentally different from every other chemical in its class, so different in fact that it's actually fit for *consumption*. When the stakes are literally our very health, are we to believe at face value the reassuring advertising copy of the sucralose manufacturers, or do we owe it to ourselves to dig a little deeper?

The possible (and many would say probable) toxicity of sucralose is so blatantly obvious from its chemical structure, that even a large number of food scientists and chemists (whose voices are rarely heard for obvious reasons) refuse to eat it. And these are not individuals who are easily frightened by scare tactics. These are largely, rational, level-headed individuals who are using their level of chemical expertise to protect themselves from what they believe to be at the very least an unnecessary risk.

**Part 2 of this sucralose Q&A will be found in the July 2007 Integrated Supplements Newsletter.**



*These statements have not been evaluated by the FDA. No Integrated Supplements product is intended to diagnose, treat, cure or prevent any disease.*