Splenda

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Recommended Citation
Available at: http://dc.cod.edu/essai/vol3/iss1/21
Humans take the energy they need to live from the food they eat. In the American diet, most of this energy comes from carbohydrates. Carbohydrates are broken down by the body and turned into simple sugars, which can be further metabolized into energy. However, consumption of more calories than needed is directly linked to weight gain, which can cause severe medical problems. The limitation of carbohydrates can lower the caloric intake and reduce weight gain.

But the human body is programmed to crave sweet foods. While this programming was designed to ensure that the body consumed nutritious fruits and vegetables, modern man has developed ways to add sugars to every food. Sugars consumed without other nutrients become “empty calories”, calories with no nutritional value that can cause weight gain if not limited. To combat this, scientists have developed artificial sweeteners. Beginning with saccharin over one hundred years ago, scientists have used artificial chemicals to sweeten food, unfortunately with high risks of side effects.

In the 1970s, scientists developed a way to make sugar indigestible by the body. Because it is made from sugar, this new compound, called sucralose, tastes more like sugar and has similar properties when used in cooking. Because of the additive, sucralose is not absorbed by the body and has a negligible effect on blood sugar levels and caloric intake. And, for reasons not yet known, sucralose has the lowest occurrence of side effects of all artificial sweeteners. Approved by the Food & Drug Administration (FDA) in 1988, sucralose is sold in the United States under the brand name Splenda®.

Carbohydrates taken into the body are metabolized into simple sugars that can be used by the body as energy. If the body consumes more energy than it needs, the excess can be stored as fat. Dieticians and nutritionists can measure a person’s risk for obesity-linked diseases based on his or her Body Mass Index (BMI). When the ratio of height in inches to weight in pounds climbs above thirty, the risk of disease rises above fifty percent. Diabetes, heart disease, stroke, and other diseases can be debilitating, even fatal if unchecked.

The elimination of excess carbohydrates from the diet is an effective part of a weight control diet. By limiting the energy intake and increasing the energy output, the body will have less excess energy to store, thus slowing weight gain and even promoting weight loss. While carbohydrates are a necessary part of a balanced diet, common table sugar, or sucrose, is a source of empty calories that is easy to avoid. Sucrose is not often found naturally. More often it is added to desserts, such as cakes, cookies, and other baked goods. The safest way to lower carbohydrates intake without losing nutrients is by eliminating sucrose.

However, cutting sweets from the diet completely, while physically beneficial, is not
emotionally or spiritually satisfying. Americans think of sweet goods as comfort food, and while some are willing to limit consumption, those who can eliminate it completely are few and far between. On top of this, people with diabetes and other dietary restrictions seek ways to satisfy their craving for sweets without causing the side effects. Thus, the need for an artificial sweetener was born.

First came saccharin. Discovered in 1879, it became popular when Americans began rationing sugar during World Wars I and II. In 1958, the Food & Drug Administration began testing food additives for safety, but this rule did not apply to additives used before that time. Therefore, saccharin was not actually tested by the FDA until the 1970s. Since then, the debate over saccharin’s safety has never been resolved. While most professionals believe it is safe in moderation, a Canadian study has linked excessive consumption with bladder cancer. Because it is inexpensive to produce and has a high point, it is still commonly used to sweeten carbonated beverages and baked goods. Saccharin is sold under the brand name Sweet ‘n Low®.

Aspartame, sold under the brand names NutraSweet® and Equal®, was approved by the FDA as a food additive in the early 1980s and has been under attack ever since. Aspartame is made from amino acids. Two of these, phenylalanine and aspartic acid, have been linked to multiple sclerosis, lupus, psychological abnormalities, and even death. Byproducts of aspartame metabolism include methanol and formaldehyde, which are known to be lethal in high doses. Persons with a rare hereditary disease known as phenylketonuria cannot metabolize phenylalanine, causing an allergic reaction that can be fatal. The FDA claims that aspartame is perfectly safe in moderation, and that only persons who indulge in aspartame to excess are at risk for these side effects. The FDA does require that all products containing aspartame be labeled as containing phenylalanine because of the risk of death.

Then scientists at a subsidiary of Johnson & Johnson began experimenting with sugar itself, more specifically the monosaccharide commonly known as glucose. A portion of the glucose molecule is replaced with chloride, making a new substance called sucralose. Sucralose was approved by the Food & Drug Administration (FDA) in 1998. Pure sucralose is more than six hundred times sweeter than sugar. It is mixed with maltodextrin, a calorie-free starchy powder, and sold under the brand name Splenda®.

Sucralose has many advantages. It has a shelf life similar to sugar. Some sugar substitutes, including sugar alcohols, do not have a long shelf life, breaking down in the pantry and becoming unusable. Also sucralose does not break down when exposed to heat as aspartame does, making it easier to use in place of sugar in baking recipes. More important than these are the two major selling points of sucralose. First, sucralose does not affect blood glucose levels. Second, sucralose has not been linked to the severe side effects associated with sweeteners made with other chemicals.

Sucralose is made when a glucose molecule is chlorinated. Glucose is a simple sugar composed of chains of carbon, hydrogen, and oxygen. Three chains of the molecule are removed and replaced with chlorine atoms. This new substance is crystalline and soluble in water. A water solution of 5% sucralose is more than six hundred times sweeter than sugar.

The body is designed to metabolize carbohydrates by turning them into simple sugars. Studies have shown that the body is confused by the addition of chlorine to the chain. Man absorbs less than 25% of the sucralose ingested. The undigested sucralose passes through the intestines into waste without being metabolized. The amount that is absorbed passes through the body quickly and is expelled in urine. This is good news for diabetics, who can safely consume sucralose without a significant effect on blood-glucose levels.
The European Commission on Health & Consumer Protection conducted an extensive study in 2000. They state: “there is adequate evidence, both for sucralose and its hydrolysis products, that there are no concerns about mutagenicity, carcinogenicity, developmental or reproductive toxicity.” Most side effects associated with artificial sweeteners are based on the body’s inability to properly metabolize the new chemicals. Allergic reactions especially are caused by metabolic problems. The European Commission found that these metabolic problems do not occur with sucralose. They ten concluded “…sucralose is acceptable as a sweetener for general food use…”.

All foods should be consumed in moderation. A healthy lifestyle begins with a well-balanced diet that strictly limits empty calories. Before 1998, a person looking to sweeten foods without the empty calories was limited in their selection by the high risk of side effects associated with the sweeteners. Now there is sucralose. Sucralose, sold under the brand name Splenda®, is a sugar-based sweetener that has a negligent effect on blood-glucose levels and a low risk of side effects. Splenda is best used when mixed with sugar in baking, lowering the actual amount of sugar used without effecting the taste of the finished product. Thus, Americans can reduce their intake of empty calories without risking their lives or losing their desserts.

Works Cited


