

Culinary Nutrition News: Sweeteners Exposed

Provided through a partnership between ACF Chef & Child Foundation and Clemson University, and sponsored by French's Foodservice.

From your morning cup of coffee to the preparation of baked goods, marinades and dressings, sugar is everywhere in everyday life—especially for chefs. In 2009, the American Heart Association (AHA) reported that the average American consumes 22 teaspoons of added sugar (not sugars found naturally in foods) every day. That's almost half a cup of solid sugar accounting for 355 calories. Currently, there are two official guidelines for the intake of added sugars:

1 The AHA suggests that women should consume no more than six teaspoons of added sugar daily, while men should consume nine teaspoons or less per day.

2 The U.S. Department of Agriculture (USDA) recommends people limit their added sugars to include no more than six to 10 percent of your total calories. That is approximately eight to 10 teaspoons a day for people following a 2,000-calorie diet.

To put this into perspective, eight teaspoons of sugar is the equivalent of the sugar content found in one 12-ounce soda. While the Dietary Guidelines also recommend that we limit our intake of added sugars, they do not give distinct measurements for these limitations. Moreover, these recommendations fail to go into detail on the types of sweeteners available and their possible effects on your health. In this article, we will expose sweeteners for what they really are and answer common questions: Are they

naturally or artificially sweet? Which ones are the best for diabetics? Which ones are said to cause cancer? Which ones help prevent weight gain? Are they all bad? Are they all the same?

Sugar's sweet anatomy

During digestion, complex sugars—fructose (the sugar found in fruit and honey), lactose (the sugar in dairy), and sucrose (table sugar, which also occurs naturally in fruits and vegetables)—break down into simple sugar, or glucose, which provides energy to the body's cells. Sucrose from sugar cane or sugar beets has been a part of the human diet for centuries and remains the standard against which other sweeteners are measured. To see how these sugars measure up, see the table below:

| SUGAR | SWEETNESS |
|---|-----------|
| Fructose (fruit sugar) | 120 |
| Sucrose (table sugar) | 100* |
| Invert sugar (glucose + fructose) | 95 |
| High-fructose corn syrup (glucose + fructose) | 80-90 |
| Glucose (dextrose or blood sugar) | 70 |
| Maltose (malt sugar) | 45 |
| Lactose (milk sugar) | 40 |
| Corn syrup (glucose only) | 30-50 |

*Sucrose has been assigned an arbitrary value of 100

There are two main things you need to know about all sugar:

1. It's high in calories; therefore, it can contribute to weight gain.
2. It's full of empty calories; meaning it's void of any nutritional value.

All-natural

Natural foods, low in calories or not, have continued to grow in popularity. Unlike artificial sweeteners, natural sweeteners are those made without any chemical modification. Unfortunately, people see the word “all-natural” and immediately think “healthy.” This is not necessarily the case, especially when dealing with sweeteners. Case in point: sugar is still sugar. One can use other aliases, such as brown sugar, corn syrups, honey, molasses, maple syrup or less familiar terms, like brown rice syrup, carob powder, glucose, lactose, maltose and fructose, but they are all sugar and contain an abundance of empty calories. This means that no matter what you call it, you should still use sugar in moderation.

New natural sweeteners

Stevia is a natural sweetener extracted from the leaves of a South American herb. It is also calorie-free, but it is not an artificial sweetener. Until December 2008, stevia and its derivatives could be sold in the U.S. only as a dietary supplement. Then in 2008, stevia was approved by the FDA as GRAS (Generally Recognized As Safe). Being up to 300 times sweeter than regular sugar, stevia is said to have a slower onset and longer duration than that of sugar. However, some of its extracts may have a bitter or licorice-like aftertaste at high concentrations. Stevia sweeteners are approved for food and beverage use in several countries and can be found in the U.S. in many food and

beverage products, such as some juices and teas, as well as tabletop sweeteners.

Agave nectar is another natural sweetener that's been creating a buyer frenzy, especially in the culinary world. Agave is a syrup that comes from the same Mexican plant that gives us tequila. It comes in three varieties: light, amber and raw. While agave is thinner than honey, it is slightly thicker than a simple syrup. Unlike Stevia, agave is not calorie-free. It contains 20 calories per teaspoon, five more than granulated sugar, but because it's sweeter than sugar, you need less to achieve the same level of sweetness. It does, however, have a lower glycemic index than that of table sugar, which means it takes longer for the body to convert it to glucose. Still, diabetics should be as cautious with agave as

they are with sugar, honey or any other carbohydrate. In fact, after an agave product caused severe side effects in diabetics, researches at the Glycemic Research Institute in Washington, D.C., announced that they are halting clinical trials of agave until they discover why these dangerous side effects took place. To read more on this report, visit the Glycemic Research Institute at www.glycemic.com/AgaveReport.htm.

Mostly artificial

Sometimes referred to as non-nutritive sweeteners, artificial sweeteners, or sugar substitutes, low-calorie sweeteners are ingredients added to foods and beverages to provide sweetness without adding calories. According to the International Food Information Council, they have a long history of safe use in a variety of foods and beverages and are some of the most studied and reviewed food ingredients in the world today, having passed rigorous safety assessments. Studies have also repeatedly shown that low-calorie sweeteners do not cause or increase the risk of developing cancer, which was once a common belief. A recent epidemiological study by the National Cancer Institute (NCI) showed that aspartame use is not associated with any increased risk of cancer, even among individuals who have high aspartame intakes. For further discussion on the cancer research conducted on each approved low-calorie sweeteners, visit the NCI's fact sheet on artificial sweeteners at www.cancer.gov/cancertopics/factsheet/Risk/artificial-sweeteners.

For more facts on low-calorie sweeteners, visit the International Food Information Council Foundation at <http://internal.ific.org/publications/factsheets/lcsfs.cfm>.



SPOTLIGHT ON HIGH-FRUCTOSE CORN SYRUP

High-fructose corn syrup (HFCS) is a man-made sweetener that was widely introduced into the food supply nearly 30 years ago. It can be found in many processed foods, from cereals to salad dressings. It also sweetens almost all regular (not diet) soft drinks in America. However, some food companies have been reverting back to plain natural sugar as opposed to HFCS due to consumer speculation. While it is important to note that both sugar and HFCS provide the same number of calories per gram, it may also be of value to note that HFCS has continued to gain attention in the media.

The glucose-to-fructose ratio in HFCS is nearly 1:1, similar to the ratio in honey, fruits and fruit juices, and the main distinction in its composition between sucrose and other fructose-containing sweeteners is the presence of a bond linking fructose and glucose.¹ Studies also suggest our bodies break down and use HFCS and sucrose the same way. Yet, it is safe to presume that consuming excessive amounts of products sweetened with it, as with any sugar, will undoubtedly cause weight gain.



SPOTLIGHT ON HONEY

Nature's sweet treat, honey, can be found in more than 300 varieties in the United States, the three most popular being clover, orange blossom and sage. It also comes in three basic forms: comb honey with the liquid embedded in the edible comb; chunk-style or cut comb with pieces of the honeycomb included in the liquid; and liquid honey that has been extracted from the comb and pasteurized to prevent crystallization. Also varied is honey's color that can range from almost colorless to dark amber and its flavor, from satisfyingly mild to boldly rich. In general, a darker color signifies a stronger, more intense flavor, and the *Journal of the American Dietetic Association* reports that honey provides more antioxidants than white sugar, corn syrup, or agave.² Unfiltered raw honey is particularly rich in antioxidants as well as enzymes that aid digestion. In recipes, try substituting up to half the sugar with honey.

LOW-CALORIE SWEETENERS

| Sweetener | Date Approved | Sweeter Than Sugar | Brand Name(s) |
|-----------|---------------------|--------------------|--|
| Neotame | 2002 | 7,000 x | n/a |
| Sucralose | 1998 | 600 x | Splenda® |
| Sacchrine | Years prior to 1958 | 300 x | Sweet 'N Low®, Sweet Twin, Sugar Twin®, others |
| Stevia | 2008 | 300 x | Truvia™, PureVia™, Sun Crystals® |
| Ace-K | 1988 | 200 x | Sunett®, Sweet One® |
| Aspartame | 1981 | 180 x | NutraSweet®, Equal®, others |



Sources: *Comprehensive Reviews in Food Science and Food Safety*, IFT, 2006 *Food and Chemical Toxicology*, 2008

"According to researchers in *The Journal of Pediatrics*, children with the highest level of added sugar intake had the lowest consumption of most nutrients and servings of grains, vegetables, fruits and dairy."³

In the U.S., the most common and popular low-calorie sweeteners permitted for use in foods and beverages can be seen on the previous page. When added to foods and beverages, these low-calorie sweeteners provide a taste that is similar to that of table sugar, but are generally several hundred to several thousand times sweeter than sugar. This is why they are often referred to as "intense" sweeteners, and because of their intense sweetening power, they can be used in very small amounts adding a negligible amount of calories.

The bittersweet truth

What is more important than the type of sweetener is how much sugar you eat and whether it is taking the place of other nutrients in your diet. So regardless of whether you are artificially or naturally inclined when it comes to sweeteners, remember to focus more on using sweeteners in moderation to enhance the flavor of nutritious foods.

Cooking for kids

According to researchers in *The Journal of Pediatrics*, children with the highest level of added sugar intake had the lowest consumption of most nutrients and servings of grains, vegetables, fruits and dairy.³ The average child consumes about twice as much sugar as recommended, and sugary foods and beverages tend to be high in calories and low in nutrients. In other words, young people are filling up on empty calories rather than nutritious foods. Since children have grown accustomed to indulging in lots of refined sugars, from sodas to desserts, it is imperative now more than ever that we attempt to stir their cravings away from foods loaded with sugar, fat and

calories, toward wholesome foods with natural sweet notes, such as fruits and vegetables. In the future, we look forward to hearing your thoughts and ideas on how to redefine the quality of children's menus from your own personal vault of recipes, tips and advice.

Dr. Margaret D. Condrasky, R.D., C.C.E., is an associate professor of Food Science and Human Nutrition at Clemson University. She leads the CU CHEFS® program for improving culinary nutrition skills.

Marie Hegler is a graduate of the Food Science and Human Nutrition department with a culinary science emphasis at Clemson University, which operates the CU CHEFS® program for improving culinary nutrition skills.

About the American Culinary Federation and the Chef & Child Foundation



The American Culinary Federation, Inc., established in 1929, is the premier professional organization for culinarians in North America. With more than 22,000 members spanning 230 chapters nationwide, ACF is the culinary leader in offering educational resources, training, apprenticeship and accreditation. In addition, ACF operates the most comprehensive certification program for chefs in the United States. ACF is home to ACF Culinary Team USA, the official

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representative for the United States in major international culinary competitions, and to the Chef & Child Foundation, founded in 1989 to promote proper nutrition in children and to combat childhood obesity. For more information, visit www.acfchefs.org.

About Clemson University



CU CHEFS® (Clemson University's Cooking and Healthy Eating Food Specialists) instructional program, led by Dr. Marge Condrasky, Associate Professor in Food Science and Human Nutrition, is a registered trademark of Clemson University designed to promote changes in menu planning, food purchasing, food preparation and food consumption behaviors with a goal of fostering good health through healthy nutrition. 'Culinary nutrition' is the application of nutrition principles combined with food science knowledge displayed through a mastery of culinary skills. The results are healthy eating behaviors grounded in culinary confidence and nutrition alertness. CU CHEFS® promotes an awareness of the latest trends in foods and nutrition through the demonstration of proficient culinary skills to produce flavorful, health-inspired menus for schools, churches, restaurants. Clemson

University, located in Clemson, S.C., is ranked 22 among the nation's top public institutions. Since 2001, Clemson has doubled external research funding, raised the academic profile of the student body, increased retention and graduation rates, launched high-profile economic development and has earned national accolades, including being named *TIME* magazine's Public College of the Year.

About French's Foodservice



French's Foodservice is proud to sponsor this series of nutritional articles authored by Clemson University for the American Culinary Federation's Chef & Child Foundation. At French's Foodservice, we believe that "you are what you serve" and have built our

reputation by providing the highest quality ingredients to meet the ever-changing needs of the foodservice industry. As chefs, restaurateurs, educators and nutritionists, you positively impact the health of our nation by advocating the positive impact of healthy eating, especially among children. We are proud to support this worthy cause.

Over the last 100 years, French's has become one of the most recognized and respected brands in America. Today, the French's Foodservice family of brands delivers the highest quality, most flavorful products possible. For the brands your patrons know and love and the incredible flavors that enhance everything from soups and salads to sandwiches and entrees, entrust your patrons to the flavors of French's.



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According to the *Journal of the American Dietetic Association*, honey contains more antioxidants than white sugar, corn syrup or agave and can also aid in digestion.²



High-fructose corn syrup (HFCS) is a man-made sweetener that can be found in many processed foods, from cereals to salad dressings, as well as almost all non-diet soft drinks in America.