

Fast Facts about High-Fructose Corn Syrup

Whether the menu calls for glazed ham, hot oatmeal or blueberry pancakes, the home cook has a repertoire of sweeteners to choose from. Sugar, brown sugar, honey, molasses, and corn syrup all have a place on the pantry shelf depending on the recipe and what roles the sweetener needs to play.

The food manufacturer has a similar catalog of sweeteners on hand, with some additions – high-fructose corn syrups or HFCS for short. These sweeteners came of age during the 1970s when the food industry began to look for alternatives to traditional cane sugar and beet sugar that would provide similar sweetness, taste, and quality, but at a more economical cost. Today, HFCS syrups and sugar are the most common sweeteners found in a wide variety of products on supermarket shelves.

1 What is High-Fructose Corn Syrup?

Corn processors make high-fructose corn syrup from corn starch. The first step in processing is to make syrup from corn starch, which is nearly 100 percent glucose.

All the forms of HFCS are mixtures of two common sugars, glucose and fructose, and have no artificial or synthetic ingredients.



HFCS-55 is the HFCS typically used in most beverages and foods. It is very similar to table sugar (sucrose) in composition—about half glucose and half fructose—which explains why they are comparable in taste and sweetness.

HFCS is known by other names, such as isoglucose, in other countries.

2 HFCS Uses in Food

Consumers will find high-fructose corn syrups in numerous products, including yogurts, baked goods, canned and packaged foods, candies, jams, condiments, many beverages, and other sweetened foods. HFCS has many functional properties that improve foods and beverages. It enhances fruit and spice flavors, prolongs product freshness, aids in fermentation, provides product stability, and promotes cooked flavors and surface browning in baked goods. These functions are

very similar to the roles that sugar plays in food preparation. As a liquid, HFCS offers the additional advantages of blending easily with other ingredients and easy pouring and mixing in beverages.



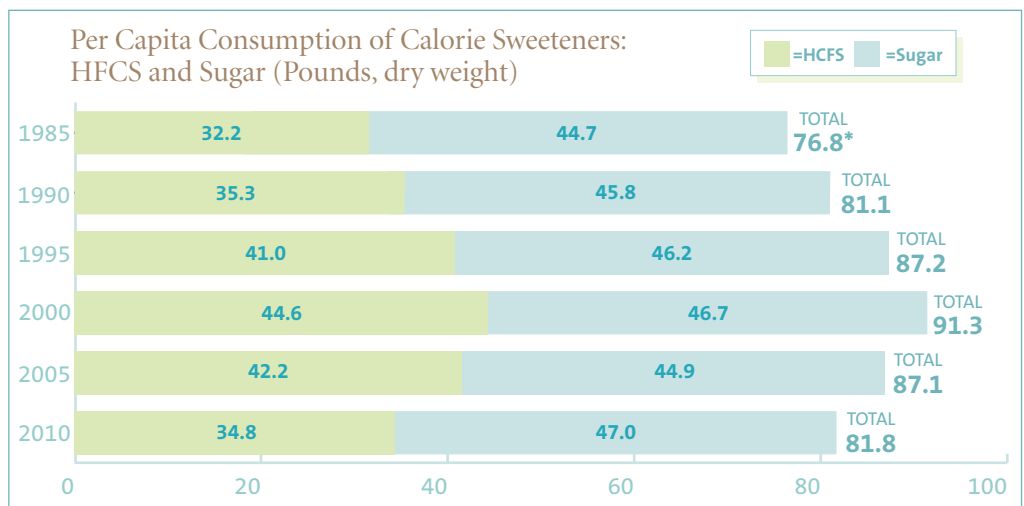
3 Consumption Facts

As methods for producing HFCS improved, food and beverage companies replaced sugar with HFCS on a nearly one-for-one basis. The U.S. Department of Agriculture estimates that today Americans consume approximately equal amounts of HFCS and sugar (note that total consumption has gone down) (See chart).¹



Functions of HFCS in Foods

- Provides sweetness intensity equivalent to sugar.
- Enhances many fruit, citrus and spice flavors in beverages, bakery fillings, and dairy products.
- Preserves and protects food by reducing water activity in products such as jams and jellies.
- Preserves texture of canned fruits and reduces freezer burn in frozen fruits.
- Provides soft, moist texture allowing production of chewy cookies, snack bars, and other baked goods.
- Provides body and texture in beverages.
- Imparts browning and flavor to baked goods, including breads, cakes, cookies, and breakfast cereals.



(*) is due to rounding
 USDA estimates adjusted for losses (non-edible food parts and food lost through spoilage, plate waste, and other losses in the home and marketing system)

4 Health and Nutrition Facts

a. Safety – The Food and Drug Administration (FDA) has approved HFCS as a safe ingredient for use in foods and beverages. The FDA based its decision in part on the substantial similarity between HFCS and table sugar (sucrose).

b. Calories – HFCS and table sugar contain the same number of calories – 4 calories per gram or 16 calories per teaspoon. In fact, as carbohydrates, most nutritive sweeteners provide approximately the same number of calories per gram.

c. Metabolism – This term refers to how the body converts food into nutrients that can be used by the body's cells to sustain life and growth. Tests have shown that HFCS, table sugar, and honey all are digested and metabolized similarly. This is not surprising since their compositions are similar.

d. Obesity – Excess body fat results when people do not balance their energy (caloric) input with energy output. No single food or ingredient is the sole cause of



obesity. Rather, the combination of too many calories and too little exercise is the primary cause. Extra calories can come from all caloric nutrients—proteins, fats, alcohol, and carbohydrates, including starches and sugars, such as HFCS.

Some researchers have noted a correlation between increased consumption of HFCS and the rise in obesity over the last 30 years. However, in 2007 a group of experts from the Center for Food, Nutrition, and Agriculture of the University of Maryland examined all the evidence and concluded that HFCS is not uniquely fattening and does not contribute to overweight or obesity any differently than other caloric foods.²

5 The Bottom Line

High-fructose corn syrup is a safe and important functional ingredient in many foods. All sugars, including HFCS, can be included in a health promoting diet if eaten in moderation.

The Academy of Nutrition and Dietetics advises consumers that they can safely enjoy nutritive sweeteners when they are consumed as part of an overall diet that meets government recommendations.³ The *Dietary Guidelines* for

Americans recommends that Americans give priority to ensuring that their diets provide enough nutrients while not overdoing calories. Once an adequate diet is assured, individuals should use balance and moderation in choosing sweetened foods and beverages or other caloric foods.



IFIC has developed extensive consumer information on the subjects of carbohydrates and nutritive sweeteners, including high-fructose corn syrup. For further information, please see:

IFIC Sugars and Health Resources.

http://www.foodinsight.org/Resources/Detail.aspx?topic=Sugars_and_Health_Resource_Page

The Science of Sugars.

Schorin M, Sollid K, Smith Edge M, Bouchoux A. A Closer Look at Sugars. *Nutrition Today*. 2012;47(3):96–101. doi: 10.1097/NT.0b013e3182435de8

References:

1. USDA, ERS Briefing Rooms, Sugar and Sweeteners Yearbook Tables. <http://www.ers.usda.gov/Briefing/Sugar/Data.htm> Table 51-52. Accessed April 20, 2012.
2. Forshee, R.A., et. al. (2007) A critical examination of the evidence relating high fructose corn syrup and weight gain. *Crit Rev Food Sci Nutr* 47:561-582.
3. Position of the Academy of Nutrition and Dietetics: Use of Nutritive and Nonnutritive Sweeteners. <http://download.journals.elsevierhealth.com/pdfs/journals/2212-2672/PIIS2212267212003255.pdf>



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Tips on Moderation

- Read food labels to learn about calories and nutrient content, including the amount of total sugars.
- Eat a variety of nutrient-rich foods, including whole grain products, fruits, vegetables, dairy products, and meat, poultry, fish, and other protein foods.
- Consume moderate portions of foods and beverages that allow you to maintain a healthy weight. Include moderate amounts of your favorite foods.
- Balance your food choices over time.
- Both sweetened and unsweetened beverages contribute to hydration. Choosing from a variety of unsweetened and sweetened beverages can help moderate calorie intake.



All sugars, including HFCS, can be included in a health promoting diet if eaten in moderation.