

How Well Do You Know Sugar?



T H E S U G A R A S S O C I A T I O N

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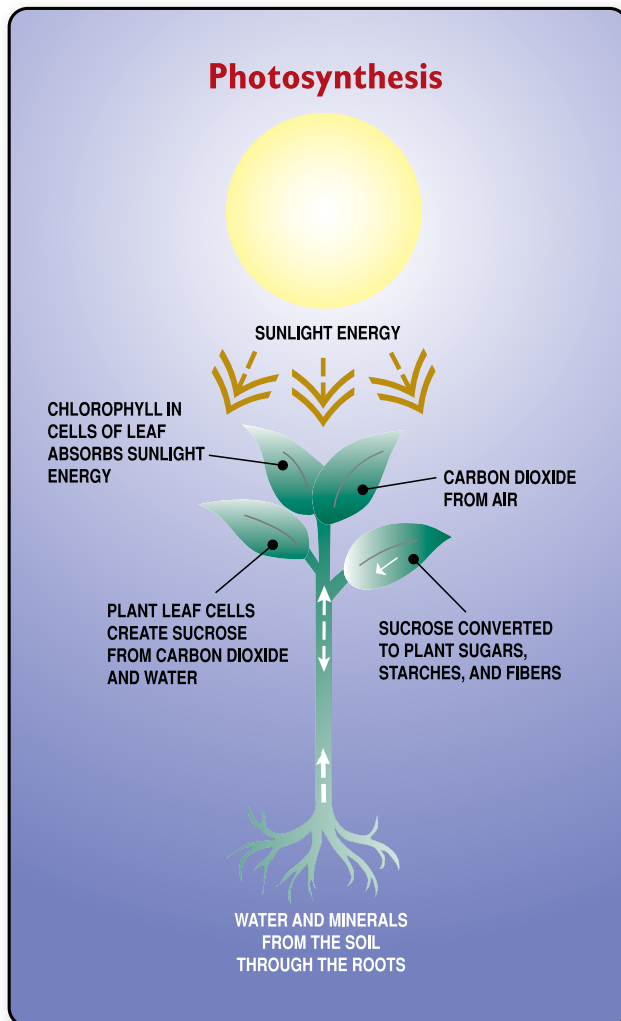
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1300 L Street NW, Suite 1001 ■ Washington, DC 20005
202.785.1122 ■ www.sugar.org

What is sugar?

Sugar (sucrose) is a carbohydrate that occurs naturally in every fruit and vegetable. It is a major product of photosynthesis, the process by which plants transform the sun's energy into food. Sucrose occurs in greatest quantities in sugar cane and sugar beets from which it is separated for our use. The sugar in your sugar bowl is exactly the same sugar that is in a peach or watermelon.



Raising CANE

Sugar cane is a tropical grass that grows 10-20 feet high. Four U.S. states produce sugar cane: Florida, Hawaii, Louisiana and Texas. A stalk of the sugar cane plant contains 12-14% sucrose. The process of separating sugar from the sugar cane plant is accomplished in two steps, first at sugar mills and then at sugar refineries.



It's in the BEET

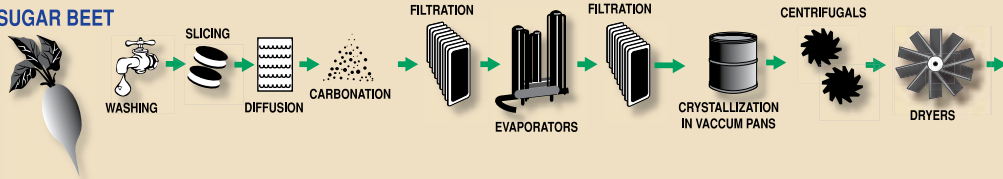
Sugar beets flourish in temperate climates where the soil is rich and the growing season is about five months long. Farms can be found in California, Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, North Dakota, Oregon, Wyoming and Washington. Sugar beets contain 16-18% sucrose and are processed at factories near the farms. Since sugar beets are grown and harvested seasonally, factories generally operate for a “campaign” (a period of time) of four to seven months. During these campaigns, facilities operate around the clock, seven days a week.



A Comparison of Beet Sugar Processing and Cane Sugar Refining

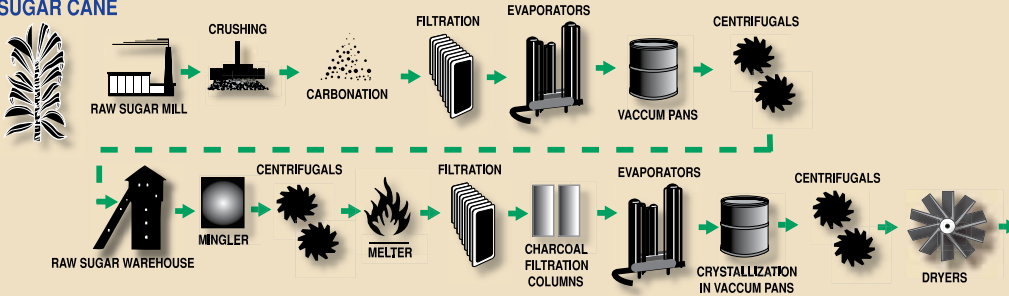
SUGAR BEET PROCESSING FACTORY

SUGAR BEET



CANE SUGAR REFINERY

SUGAR CANE



How do we get pure natural sugar?

For many people, the term “refined” has lost its original meaning – “to purify” – and now carries negative connotations. To get pure, natural sucrose, the natural sugar that is stored in the cane stalk or beet root is separated from the rest of the plant material.

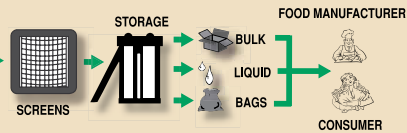
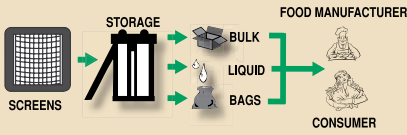
For sugar cane, this is accomplished by:

- Grinding the cane to extract the juice;
- Boiling the juice until the syrup thickens and crystallizes;
- Spinning the crystals in a centrifuge to produce raw sugar;
- Shipping the raw sugar to a refinery where it is,
- Washed and filtered to remove remaining non-sugar ingredients and color; and
- Crystallized, dried and packaged.

Beet sugar processing is similar, but it is done in one continuous process without the raw sugar stage. The sugar beets are washed, sliced and soaked in hot water to separate the sugar-containing juice from the beet fiber. The sugar-laden juice is purified, filtered, concentrated and dried in a series of steps similar to sugar cane processing.

How does sugar get white?

The thick molasses syrup is spun in a centrifuge like the one shown here. This process is similar to your washing machine spin cycle. The heavier molasses is spun out leaving behind the naturally white sugar crystals.



What happens to the materials left over from sugar processing?

Many of the materials are recycled and reused. The sugar cane stalk residue, called bagasse, often is used as a fuel to run the cane factory. Most sugar cane mills and refineries produce their own electricity and some even supply power to nearby towns. The beet residue, or pulp, is generally used for animal feed or further processed for use as fiber or other products.

Molasses, used by distillers, bakers, pharmaceutical companies and others, is recycled through the beet sugar and cane sugar refining process an average of four times to extract the maximum amount of sucrose. Carbon chips, used in filtration, are recharged (revivified) and reused, too. In addition, much of the water removed along the way still contains sucrose (called sweetwater) so it is pumped back into the stations to be used again.

Little is wasted in sugar processing.

How well do you know sugar?





How Times Have Changed

Changing lifestyles of the last 50 years have brought about a major change in the way we use sugar. Today's consumer relies more on the food industry and less on the home kitchen for meals and snacks.

In 1925, consumer use accounted for about two-thirds of total sugar consumption, while one-third was used by industry in food manufacturing. Today, those proportions are reversed. The food industry uses about 66 percent of total sugar deliveries, and direct household use has declined to about 34 percent.

Why do we need sugar?

Sugar's Amazing Function in our Food Supply

For most of us, sugar and foods sweetened with sugar conjure up life's happiest moments—birthday parties and special holidays.

But pleasure is only part of the story. Fruits get their natural sweetness from sucrose and other sugars. Vegetables such as carrots taste best when their sugar content is at its highest. Sugar provides a balanced sweet taste that other sweeteners attempt to imitate. Sugar is not hidden in food. In fact, sugar has always provided many necessary functional properties in cooking and baking.

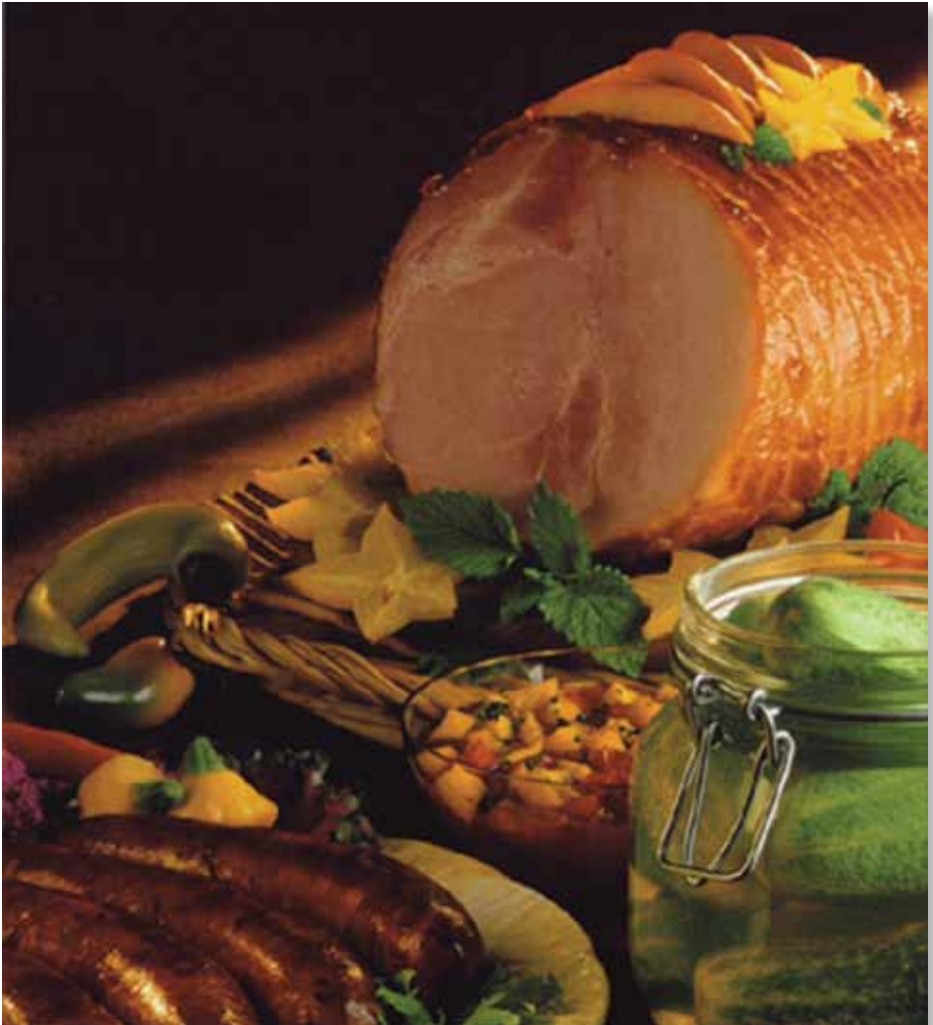
Natural sugar:

- Absorbs water and inhibits flour gluten development providing proper texture in baked goods (a little sugar – dense texture like a roll; a lot of sugar – fluffy texture like a cake)
- Helps prevent spoilage of fruit jellies and preserves by stealing the water from bacterial cells, killing them and preventing spoilage
- Is hygroscopic and absorbs water from the atmosphere keeping baked goods moist and fresh
- Balances sour, bitter and spicy components in foods like spaghetti and barbeque sauce
- Provides nourishment for yeast to help bread rise
- Helps foods brown, (called the Maillard Reaction) which is why the crust of your bread or rolls are brown
- Adds flavor and balances acidic elements in rubs, brines, dressings and cures

- Strengthens fiber and cell texture in fruits and vegetables during cooking
- Incorporates air into shortening during creaming
- Acts as a whipping aid to stabilize egg foams
- Enhances smoothness, flavor and mouth feel in dairy products

When it comes to home cooking, granulated sugar (sucrose) is the sweetener that consumers know and trust. In the food industry, too, sugar is considered the “gold standard.”

Sugar makes many nutritious foods taste “good enough to eat.” Sugar and sugar-sweetened foods are one of life’s pleasures and sugar will always be an important food ingredient.





Types of sugar

There are many types of sugar. Powdered sugar is just white sugar that is ground into powder. And, depending on the amount of molasses left on the sucrose crystal, there are many types of brown sugars that add special flavors as well as important functional purposes. For instance, soft chewy cookies get their moistness from brown sugar.

What is raw sugar?

Raw sugar is an intermediate product in cane sugar production. Produced at a sugar cane mill, it is a tan, coarse granulated product obtained from the evaporation of clarified sugar cane juice.



The raw sugar producer ships this product to a refinery for final processing. Today you will find raw sugar for consumer use. This sugar is similar to turbinado sugar explained below.

What is Evaporated Cane Juice?

Evaporated Cane Juice is the common name for the food-grade cane based sweetener produced directly from milled cane using a single-crystallization process. The filtered, clarified juice is evaporated into syrup, crystallized and cured. This free flowing sweetener has a light golden color and retains a hint of molasses flavor because there is no further processing.

What is turbinado sugar?

Turbinado sugar is raw sugar that has been refined to a light tan color by washing in a centrifuge to remove surface molasses. Many health food stores and supermarkets carry turbinado sugar.



Ironic But True

Before modern centrifuge technology was perfected, it was hard to separate all the molasses from the sugar crystal to get pure white sugar. White sugar was very expensive and only the rich could afford sugar in its pure form. The poorer people used the darker raw and brown sugar. Today the opposite is true; it is **cachet** to purchase the raw and turbinado sugars.

What is brown sugar?

Brown sugar consists of sugar crystals coated in a molasses syrup with natural flavor and color. Many sugar refiners produce brown sugar by boiling a special molasses syrup until brown sugar crystals form. A centrifuge spins the crystals dry. Some of the syrup remains giving the sugar its brown color and molasses flavor.

Other manufacturers produce brown sugar by blending a special molasses syrup with white sugar crystals.

What is demerara sugar?

Popular in England, demerara sugar is a light brown sugar with large golden crystals, which are slightly sticky from the adhering molasses. It is often used in tea, coffee, or on top of hot cereals.

What is muscovado or Barbados sugar?

Muscovado sugar, a British specialty brown sugar, is very dark brown and has a particularly strong molasses flavor.



Historically Speaking

Experts place the origin of sugar cane in the South Pacific about 8,000 years ago. Probably native to New Guinea, the plant moved northward to Southeast Asia and India. An officer of Alexander's army made the first specific mention of sugar in about 325 B.C., referring to it as a reed that yielded "honey without bees." Sugar cane cultivation and refining spread east to China about 100 B.C. In Europe, sugar was a scarce luxury until the 13th century when Venetian traders expanded its availability. Portuguese enterprise brought sugar to the west coast of Africa and then to Brazil. The Spaniards introduced sugar cultivation into their colonies in the Canary Islands, from which Columbus brought cane to the Caribbean on his second voyage in 1493. England and France established their own refineries in the 1600s to handle sugar from the West Indies. Europeans grew sugar beets for food and fodder, but in 1744 a German chemist discovered that the sugar from beets was the same as sugar from cane. Napoleon encouraged the fledgling beet sugar industry when his struggle with England resulted in the blockade of all sugar shipments from the Caribbean. In 1811 he issued a decree supporting a vast increase in French beet sugar production. Within two years the French constructed 334 factories and produced 35,000 tons of sugar.



Sicilian Factory (Hans van der Straat)

Does sugar spoil?

No. Granulated sugar will last indefinitely if stored in an airtight container in a cool, dry place. Being 99.9+% pure carbohydrate, sugar is a very low moisture food. Bacteria and other microorganisms cannot grow in this dry environment. In foods such as preserves and jams, sugar removes the water required by bacteria for growth.

Non-food uses of sugar

The physical and chemical properties that make sugar such a versatile ingredient in food preparation also make it an exceptionally functional substance for non-food applications. Some of its applications and potential uses include:

• **Pharmaceuticals** – When Mary Poppins announced that “a spoonful of sugar makes the medicine go down,” she was undoubtedly referring to sugar’s sweet taste. Actually, it is sugar’s physical properties that make it extremely useful in the pharmaceutical industry. Sugar is valued in liquid preparations for its solubility and bodying effects. In tablets, sugar functions as a diluent to control concentration of active ingredients and as a binder to hold ingredients together. Sugar coatings are used to protect tablets from chipping.

• **Wound-healing** – Scientists here and abroad have reported surprising success in the use of sugar to treat serious wounds and burns that don’t respond to conventional therapy. Although the mechanism is not clear, it appears that when sugar fills an open wound it dissolves in the tissue and produces an environment in which bacteria cannot grow. Physicians also believe sugar supplies nourishment that damaged tissue needs for regrowth.

“Over a 56-month period we treated 605 patients for wounds, burns, and ulcers with granulated sugar and povidone-iodine. Rapid healing ensued, due to a reduction in bacterial contamination, rapid debridement of eschar, probable nourishment of surface cells, filling of defects with granulation tissue, and covering of granulation tissue with epithelium. The requirements for skin grafting and antibiotics were greatly reduced, as were hospital costs for wound, burn, and ulcer care.”

Knutson RA et al Use of Sugar and Povidone-Iodine to Enhance Wound Healing

🌱 **Fermentation Products** – Sugar readily reacts with a number of other substances to produce a variety of products by fermentation. One example is ethanol. In Brazil, sugar cane ethanol has made this country almost energy independent from foreign oil sources.

🌱 **Sucrochemistry** – This term is applied to scientific efforts to produce useful compounds by manipulating the sucrose molecule. For example, sugar esters, particularly combinations of sucrose with fatty acids, are well suited for use in surface coatings, detergents and paints. Sugar ester detergents are reported to be excellent in cleaning dirt, agricultural chemicals and bacteria from fruits and vegetables.

Other non-food uses

- 🌱 The glue industry uses sugar as an extender and as a vehicle to slow the setting process.
- 🌱 Sugar plays a role in leather tanning; in the manufacture of paper ink and dyes; in textile sizing and finishing.
- 🌱 Sugar is used to slow down the setting of cement.
- 🌱 You can prolong the life of cut flowers by adding a teaspoon of sugar to the water. For cut flowers, sugar can be absorbed through the stem and transported to the petals where it is metabolized.



Other sweeteners you may find in the ingredient list

For centuries people sweetened their foods with sugar, honey and natural syrups like maple syrup. In fact, most countries still do. In the U.S., this has changed dramatically in the last 30 years due to the invention of the starch hydrolysis process. Now many ingredients used as sweeteners, fillers and bulking agents are made from starch. In the U.S., corn is the primary source for starch hydrolysis sweeteners.

These are some of the more common products you will see in the ingredient statements of everyday foods.

What is dextrose?

Dextrose is the commercial name used for the crystalline glucose produced from starch. Dextrose is 60 to 70% as sweet as sugar and has 4 calories per gram, the same as sugar.

Dextrose is used in many baking products like cake mixes and frostings, snack foods like cookies, crackers and pretzels, and desserts like custards and sherbets.

What is corn syrup?

A commercial “corn syrup” may contain between 20% and 98% dextrose (glucose). Corn syrup may also be called “glucose syrup” in an ingredient list. Corn syrups are a little less sweet than dextrose and have 4 calories per gram.

Corn syrups are used in many of today’s salad dressings, tomato sauces, powdered drink mixes, fruit drinks and juices, and frozen desserts like pudding and ice milk.

What is high fructose corn syrup?

High fructose corn syrup is manufactured from corn starch. The corn starch is first converted to a dextrose-rich syrup. Using a process called isomerization these dextrose-rich corn syrups are further processed to create

fructose. The fructose is then blended with dextrose syrup to produce the commercial corn syrup containing 42%, 55% or 90% fructose. The sweetness depends on the amount of fructose in the syrup. Fructose is 130 – 180% sweeter than sugar. These syrups have 4 calories per gram.

The vast majority of the high fructose corn syrup containing 55% fructose is used to sweeten carbonated soft drinks and other flavored beverages. The generic term “high fructose corn syrup” or its acronym “HFCS” is used in food and beverage ingredient statements regardless of fructose content.

What is crystalline fructose?

Crystalline fructose is produced by allowing the fructose to crystallize from a fructose-enriched corn syrup. The term “crystalline fructose” is listed in the ingredient statements of foods and beverages using this corn sweetener. It is important to understand that the “crystalline fructose” listed as an ingredient comes from cornstarch, not fruit. Crystalline fructose is almost pure fructose and sweeter than sugar.

Crystalline fructose can be used in the same foods as high fructose corn syrups.

What is maltodextrin?

Today’s commercial maltodextrin products are produced from corn, potatoes or rice. Maltodextrins are not sweet and have 4 calories per gram.

Maltodextrins are used in a wide array of foods, from canned fruits to snacks. They are primarily bulking agents that add bulk and texture to foods when fat or sugars are removed. Maltodextrins may also be an ingredient in the single-serve, table-top packet of some artificial sweeteners.

What are juice concentrates?

Juice concentrates are made by first heating fruit juices to remove water, and then treating with enzymes and filtering to strip all characteristic color and natural flavor from the original juice. Because of their bland initial color and flavor, grapes and pears are the primary sources of the juice concentrates used as sugar replacers. Juice concentrate provide no nutritional or caloric benefit over sugar.

They are particularly prominent in baked goods, jams and jellies, and frozen confections.

Sugar Alcohols/Polyol Sweeteners

A sugar alcohol (also known generically as a polyol) is a hydrogenated form of carbohydrate. They are commonly found in sugar-free or reduced sugar foods. The majority of sugar alcohols are made from starch. As a group, sugar alcohols are not as sweet as sugar, and average about 2.5 calories per gram.

Sugar Alcohols/ Polyols Approved in the U.S.

- Sorbitol
- Mannitol
- Xylitol
- Erythritol
- D-Tagatose
- Isomalt (Palatinat)
- Lactitol
- Maltitol
- Polydextrose
- Hydrogenated Starch Hydrolysis

Sugar alcohols are incompletely absorbed in the small intestine, which results in a smaller rise in blood glucose than other sugars. Incomplete digestion of polyol sweeteners means that they may cause, lets just say, “stomach distress” if they are over-consumed. With some sugar alcohols a manufacturer is required to put a warning statement on the package “Excessive consumption may cause gastrointestinal problems.”

What the American Diabetes Association says about the use of polyols for diabetics.

“While polyol sweeteners produce a lower post-prandial glucose response [lower glycemic index] than sucrose or glucose and have lower available energy values, there is no evidence that the amounts likely to be consumed in a meal or day result in significant reduction in total daily energy intake [caloric intake] or improvement of long-term glycemia [blood glucose].”

Test Your food label IQ

1: What does “sugars” mean in the Nutrition Facts panel?

“Sugars” refers to the family of simple carbohydrates that are found naturally in fruits, vegetables, grains and dairy products and that are added to foods as sweeteners. Naturally occurring and added sugars are identical. Whether you eat a banana or a banana nut muffin, your body cannot tell which sugars were present in the fruit and which were added by the baker.

2: Can I tell how much sugar or other sweetener has been added to a food?

Not precisely. The Nutrition Facts panel shows total sugars. The ingredient statement will list sugar and other sweeteners by name in order of the amount in the product.

The sugars content of a food is not a reliable measure of its nutritional value. Check the Daily Value for information on whether a food is high or low in important nutrients like fiber or calcium.

3: The Nutrition Facts panel gives a % Daily Value (DV) for total carbohydrate. Why is there no % Daily Value for sugars?

% Daily Value shows whether a food is high or low in a nutrient such as carbohydrates. The DV is a guideline to show how a food fits into your overall daily diet. A % DV is not given for sugars because there is no recommended maximum or minimum for sugars intake.



This Nutrition Facts Panel (NFP) is for 2% Non-Flavored Milk

NOTE: it has 12 grams of sugars, yet, no sugars are added. The sugars in milk come from lactose or milk sugar. So remember, when you check the sugars category on the NFP, the gram amount also includes the sugar in milk or fruit or grain.

Nutrition Facts	
Serving Size 1 Cup (236ml)	
Amount Per Serving	
Calories 130	Calories from fat 45
% Daily Value*	
Total Fat 5g	8%
Saturated Fat 3g	15%
Cholesterol 20mg	7%
Sodium 135mg	6%
Total Carbohydrate 13g	4%
Dietary Fiber 0g	0%
Sugars 12g	
Protein 8g	
Vitamin A 10%	Vitamin C 2%
Calcium 30%	Iron 0%



Helpful Tip:
Check
Calories

Not all reduced
or sugar-free
products have
fewer calories

Sugar as part of a healthy diet

Making sure that fruits, vegetables, whole grains and other fiber-rich foods, and calcium-rich dairy products are the centerpieces of your diet is important dietary advice. Sugar makes many of these healthy foods palatable, which helps contribute to intakes of important vitamins and minerals. A bowl of nutrient and fiber-rich homemade oatmeal tastes great with a couple of teaspoons of brown sugar.

Sweet foods and beverages that don't contribute nutrients should be thought of as treats. But, just because a food contains sugar does not make it unhealthy.



What does the science say about sugar intake?

It seems like every week a new study comes out that grabs the headlines. A single study on any subject is not conclusive and needs further investigation, therefore should not be a strong basis to change behavior.

Sugar has been an important ingredient in people's diets for centuries and the subject of countless studies. When the full body of science is evaluated during a major review of scientific literature, experts continue to conclude that sugars intake is not a causative factor in any disease, including obesity.

How well do you know sugar?



In 1986, the Food and Drug Administration's (FDA) Sugars Task Force reviewed 1000 scientific papers. They concluded that "with the exception of dental caries, the scientific evidence clears sugars of links with other diseases including diabetes, hypertension, behavior and obesity."

In 1989, the National Academy of Sciences Report on Diet and Health stated, "Sugar consumption (by those with an adequate diet) has not been established as a risk factor for any chronic disease other than dental caries in humans."

In 1997, a joint Food and Agriculture Organization/World Health Organization expert consultation concurred that "there is no evidence of direct involvement of sucrose, other sugars and starch in the etiology [cause] of lifestyle diseases."

In 2003, after a 3-year National Academy of Sciences comprehensive review of the scientific literature, the committee of scientists concluded that,

"Based on the data available on dental caries, behavior, cancer, risk of obesity, and risk of hyperlipidemia [excess blood fat like triglycerides or cholesterol], there is insufficient evidence to set a UL (upper level) for total or added sugars."

The Academy report states unequivocally, *"There is no clear and consistent association between increased intakes of added sugars and BMI [body mass index]."*

In March 2010, the European Food Safety Authority reaffirmed the IOM conclusions regarding sugars intake. After a thorough review of the scientific literature the panel of experts concluded, "Available data do not allow the setting of an UL (upper level) for total or added sugars, neither an AI (Adequate Intake) nor a recommended intake range."





Sugar has just 15 calories per teaspoon

A well-known polling organization recently conducted a survey of attributes about sugar in cities across America. One of the biggest surprises was the wide range of guesses people made about how many calories are in a teaspoon of sugar. Most respondents thought it was 50 or 60 calories; one respondent said 1000!

Sugar is all natural and only has 15 calories per teaspoon. Sugar and all carbohydrates are 4 calories per gram, protein is also 4 calories per gram, where as, fats have 9 calories per gram.

As you can see, sugar is not uniquely fattening.

Sugar is not the cause of overweight & obesity

Consuming more food (calories) than needed to maintain ENERGY BALANCE causes overweight & obesity.

What would you do to burn 15 calories?

Over the course of a day, your heart, lungs and basic body movements constantly burn calories. While these are no substitute for serious exercise, here are some ways you can burn up the calories in a teaspoon of natural sugar.

- 7 minutes of styling your hair
- 15 minutes of socializing
- 8 minutes of pumping gas
- 8 minutes taking a shower
- 8 minutes of playing an accordion
- 13 minutes of sleeping

Source: caloriesperhour.com

Based on activities performed by a 34-year-old female.



Are artificial sweeteners the answer?

Sugar and sugar-sweetened foods are one of life's pleasures, and it is unrealistic to think that people will completely forego this simple form of enjoyment. The question remains, "Is ingredient substitution the best solution for solving today's health and weight problems or will it simply create a new set of problems?"

Is there any evidence that the use of artificial sweeteners will help control weight? According to the American Dietetic Association (ADA) 2004 position paper on the use of nutritive and nonnutritive sweeteners, "Nonnutritive sweeteners (artificial) added to the diet have been shown to promote a **modest** loss of weight." Yet ADA also stated the undeniable, "The prevalence of obesity has increased substantially at the same time as the consumption of nonnutritive sweeteners (artificial) has increased."

Did you know?...the Food and Drug Administration establishes Acceptable Daily Intake levels for artificial sweeteners based on milligrams per kilogram of body weight per day (mg/kg bw/day). (See ADI table below)

Artificial Sweeteners Approved in the US

- Saccharin, sold as Sweet N Low
- Aspartame, sold as Equal or NutraSweet
- Acesulfame-K, sold as Sunett
- Sucralose, sold as Splenda
- Neotame

Sweetener	Times Sweeter than Sugar	Acceptable Daily Intake
Saccharin	200-700	5mg/kg bw/day
Aspartame	60-220	50mg/kg bw/day
Acesulfame-K	200	15mg/kg bw/day
Sucralose	600	5mg/kg bw/day
Neotame	7,000-13,000	18mg/day

Oh those myths about sugar

Why are there so many myths about sugar and why are they so easy to believe? Could it be because sugar tastes good so it's easy to believe it must be bad for you? Scientific research over decades has debunked many of the common myths about sugar. Below are science-based answers to a few of the more common myths about sugar:

Sugar is not addictive.

Addiction is compulsive behavior with medically identifiable physiological (physical) symptoms. Eating sugar or any other carbohydrate (or protein or fat) does not produce these symptoms.

The reality is people like tasty foods. But there are distinct differences between a psychological dependency that is often an emotional response to food and actual physical dependence. Food does not generate withdrawal, the medically distinct symptoms characteristic of authentic addiction.

No matter how much a person likes the taste of sweet foods, it is highly unlikely that a person would rush to the kitchen for a teaspoon of sugar and not many sweethearts would find a heart-shape box filled with just granulated sugar appealing.

What are glycemic index & glycemic load?

The body must convert the starches and sugars in foods into blood glucose to meet basic energy needs. The glycemic index (GI) is a measure of how fast the body breaks down starches and sugars into blood glucose after a food or beverage is consumed. The glycemic load is determined by multiplying a food's glycemic index by the amount of carbohydrate it contains.

Sugar is not a high glycemic food.

You may have seen television diet advertisements or popular diet books that tout the benefit of eating according to the glycemic index. They would like you to believe that only low glycemic index foods are good and high are bad.

The popular belief that sugar should be avoided

because it has a high glycemic index is wrong. Sugar has a moderate glycemic index, similar to those of wheat bread and brown rice.

Furthermore, the glycemic index of a food can be changed by adding fat or protein. For example, putting butter on your baked potato lowers its glycemic index.

As the table shows, at a GI of 58 sugar is a moderate glycemic food.

Sugar does not cause a sugar high.

The premise that sugar causes a rapid rise in blood glucose or glycemic response which then triggers an abnormal production of insulin followed by an atypical drop in blood glucose is not a physiological or scientific reality. Sugar does not uniquely raise blood glucose levels as you can see from the glycemic index table above.

Sugar does not cause diabetes.

A person with diabetes either does not produce enough insulin or cannot properly use the insulin the pancreas does produce.

According to the American Diabetes Association and every other major scientific body, sugar does not cause diabetes.

You can access information on popular myths about diabetes on the internet at: <http://www.diabetes.org/diabetes-basics/diabetes-myths>

Not only does sugar not cause diabetes but individuals with diabetes do not have to strictly avoid eating sugar according to the

Comparison of glycemic index and glycemic load of certain foods		
Food	Glycemic index	Glycemic load
Apple	40	6
Baked potato	85	26
Brown rice	50	16
Carrots	92	5
Corn flakes	92	24
Orange juice	50	13
Plain bagel	72	25
Potato chips	54	11
Wheat bread	53	11
Table sugar (sucrose)	58	6

Ranges for glycemic index (GI) and glycemic load (GL)		
	GI	GL
High	70 or more	20 or more
Medium	56 to 69	11 to 19
Low	55 or less	10 or less

K F Powell et al, International table of glycemic index and glycemic load values: 2002, *Am J Clin Nutr* 2002; 76:5-56

Myth: Eating too much sugar causes diabetes. No. Diabetes is caused by a combination of genetic and lifestyle factors. However, being overweight does increase your risk for developing type 2 diabetes. If you have a history of diabetes in your family, eating a healthy meal plan and regular exercise are recommended to manage your weight.

American Diabetes Association:

“The available evidence from clinical studies demonstrates that dietary sucrose does not increase glycemia more than isocaloric amounts of starch. Thus, intake of sucrose and sucrose containing foods by people with diabetes does not need to be restricted because of concern about aggravating hyperglycemia. Sucrose should be substituted for other carbohydrate sources in the food/meal plan or, if added to the food/meal plan, adequately covered with insulin or other glucose-lowering medication.”

Sugar does not make you hyper.

Folklore linking certain foods, such as sucrose or table sugar, with very active behavior in children began in the early 1970s, when Dr. Benjamin Feingold proposed the theory that diet may adversely affect children’s behavior. Since that time, considerable research has been devoted to the subject. In over 20 studies, including those supported by the Food and Drug Administration, science has been unable to support claims that sugar affects children’s behavior.

In carefully controlled studies, meals were provided for two weeks to children whose parents believed their children were affected by sugar. Parents and teachers monitored their behavior after the meals, unaware of whether the children had consumed sugar or artificial sweeteners. No adverse effects were found from either.

A 1995 meta-analysis [a systematic review of the scientific literature] published in the *Journal of the American Medical Association* confirmed clearly that sugar does not cause hyperactivity or behavior problems. **This conclusion remains settled science.**

Sugar contributes more than just empty calories.

Sugar is pure carbohydrate, the nutrient we use to fuel our bodies and brain. Not all foods that contain sugar are a poor source for nutrients. Sugar can improve the palatability of foods and beverages that otherwise might not be consumed therefore contribute to the intake of important micronutrients, such as calcium.

The statement that sugar supplies calories but few or no nutrients is misleading because people don’t consume sugar in isolation but consume foods and beverages that contain sugar or have sugar as necessary functional ingredients.

Clearly, the important consideration for healthy eating is not the sugar content of a food but having a healthy overall diet that does not exceed ones caloric needs.

Again we emphasize, making sure that fruits, vegetables, whole grains and other fiber-rich foods, and calcium-rich dairy products are the centerpieces of your diet is important advice. Sugar makes many of these healthy foods tasty enough to eat.

Sweet foods and beverages that don't contribute nutrients should be thought of as treats.

REMEMBER, just because a food contains sugar does not make it unhealthy.
Evaluate a food based on its overall nutrient content.

The Importance of Being Physically Active

Eating right is only half of the equation for being healthy. Physical Activity and good nutrition are essential elements to prevent diseases and obesity.



The following is taken from The U.S. Department of Health and Human Service published Physical Activity Guidelines for Americans.

For more information, please visit:
<http://www.health.gov/paguidelines/factsheetprof.aspx>

Key Guidelines

Substantial health benefits are gained by doing physical activity according to the Guidelines presented below for different groups.

Children and Adolescents (aged 6–17)

- Children and adolescents should do 1 hour (60 minutes) or more of physical activity every day.
- Most of the 1 hour or more a day should be either moderate- or vigorous-intensity aerobic physical activity.
- As part of their daily physical activity, children and adolescents should do vigorous-intensity activity on at least 3 days per week. They also should do muscle-strengthening and bone-strengthening activity on at least 3 days per week.

Adults (aged 18–64)

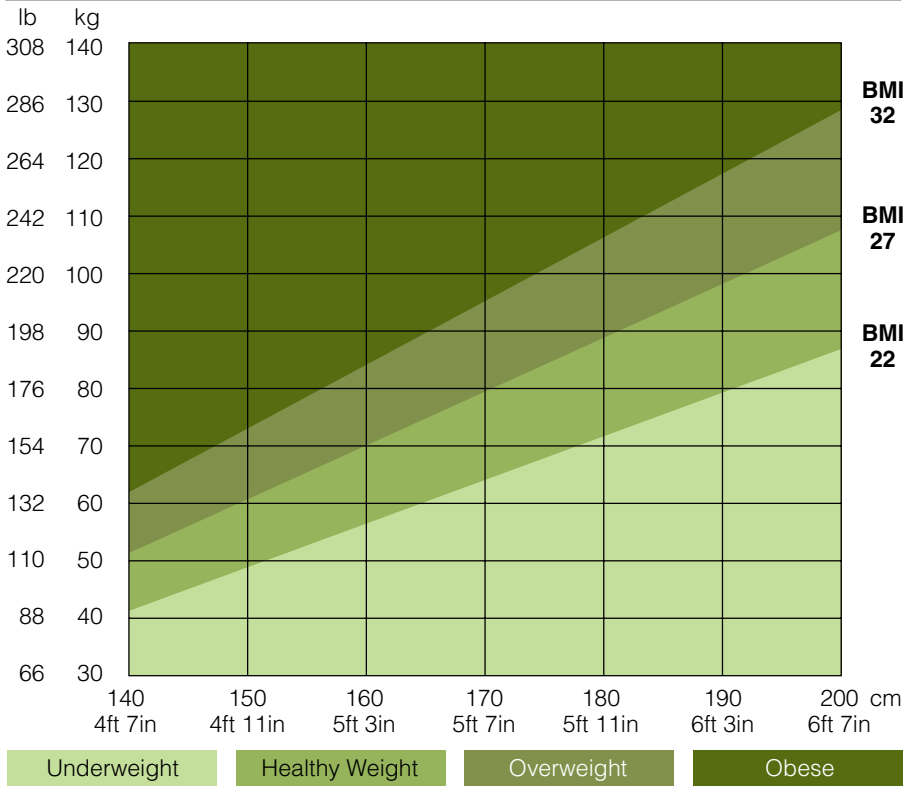
- Adults should do 2 hours and 30 minutes a week of moderate-intensity, or 1 hour and 15 minutes (75 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic physical activity. Aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week.

- Additional health benefits are provided by increasing to 5 hours (300 minutes) a week of moderate-intensity aerobic physical activity, or 2 hours and 30 minutes a week of vigorous-intensity physical activity, or an equivalent combination of both.
- Adults should also do muscle-strengthening activities that involve all major muscle groups performed on 2 or more days per week.

CONSIDER THIS:

If you eat 100 more foodcalories a day than you burn, you'll gain about 1 pound in a month. That's about 10 pounds in a year. The bottom line is that to lose weight, it's important to reduce calories and increase physical activity."

Are You a Healthy Weight?



Energy balance challenge

Do you know if you are maintaining energy balance? Here is a fun way to find out where you stack up. In the 7 day diary provided in this book write down everything you eat and drink. The following page contains links to find out how many calories are in the foods you're eating.

Below are websites that will help you find out how many calories you should be consuming based on age, height, weight and activity level. And, how many calories you burn during different activities.

Keep track in the 7 day diary and see how close you are to maintaining energy balance. Of course if you want to lose weight you will need to cut calories or increase your activity level, or both.

Websites that provide the calories in your favorite foods:

- 🐞 <http://www.fitwatch.com/caloriecounter.html>
- 🐞 <http://www.howmanycaloriesin.com>

Websites that help you calculate how many calories you should consume to maintain energy balance:

- 🐞 <http://walking.about.com/cs/calories//blcalcalc.htm>
- 🐞 <http://www.bcm.edu/cnrc/caloriesneed.htm>
- 🐞 <http://www.stevenscreek.com/goodies/calories.shtml>
- 🐞 http://pediatrics.about.com/library/bl_calorie_calc.htm

Activity calorie counter websites:

- 🐞 <http://www.fitnessmagazine.com/weight-loss/caloric-needs-calculator/?ordersrc=googlefitness1calorie>
- 🐞 http://www.healthdiscovery.net/links/calculators/calorie_calculator.htm

Take this challenge.

It will help you put your caloric intake and activity level into perspective. Remember pay close attention to serving sizes.

Good Luck



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