

NIH News in Health

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Inside News: 3 Cold, Flu, or Allergy?... 4 Genetic Clues to Ebola Outbreak ... NIH Health Information... Noisy Planet

Sweet Stuff

How Sugars and Sweeteners Affect Your Health

Most of us love sweet foods and drinks. But after that short burst of sweetness, you may worry about how sweets affect your waistline and your overall health. Is sugar really bad for us? How about artificial or low-calorie sweeteners? What have scientists learned about the sweet things that most of us eat and drink every day?

Our bodies need one type of sugar, called **glucose**, to survive. "Glucose is the number one food for the brain, and it's an extremely important source of fuel throughout the body," says Dr. Kristina Rother, an NIH pediatrician and expert on sweeteners. But there's no need to add glucose to your diet, because your body can make the glucose it needs by breaking down food molecules like **carbohydrates**, proteins, and fats.

Some sugars are found naturally in foods, such as fruits, vegetables, and milk. "These are healthful additions to your diet," says Dr. Andrew Bremer, a pediatrician and NIH expert on sweeteners. "When you eat an or-



ange, for instance, you're getting a lot of nutrients and dietary fiber along with the natural sugars."

Although sugar itself isn't bad, says Rother, "sugar has a bad reputation that's mostly deserved because we consume too much of it. It's now in just about every food we eat."

Experts agree that Americans eat and drink way too much sugar, and it's contributing to the obesity epidemic. Much of the sugar we eat isn't found naturally in food but is added during processing or preparation.

About 15% of the calories in the American adult diet come from added sugars. That's about 22 teaspoons of added sugar a day. Sugars are usually added to make foods and drinks taste better. But such foods can be high in calories and offer none of the healthful benefits of fruits and other naturally sweet foods.

Sugar-sweetened beverages like soda, energy drinks, and sports drinks are the leading source of added sugars in the American diet. Juices naturally contain a lot of sugar. But sometimes, even more is added to make them taste sweeter.

"Juices offer some vitamins and other nutrients, but I think those benefits are greatly offset by the harmful effects of too much sugar," says Bremer.

Over time, excess sweeteners can take a toll on your health. "Several studies have found a direct link between excess sugar consumption and obesity and cardiovascular problems worldwide," Bremer says.

Because of these harmful effects, many health organizations recommend that Americans cut back on added sugars. But added sugars can be hard to identify. On a list of ingredients, they may be listed as sucrose (table sugar), corn sweetener, high-fructose corn syrup, fruit-juice concentrates, nectars, raw sugar, malt syrup, maple syrup, fructose sweeteners, liquid fructose, honey, molasses, anhydrous dextrose, or other words ending in "-ose," the chemical suffix for sugars. If any of these words are among the first few ingredients on a food label, the

continued on page 2



Definitions

Glucose

A type of sugar used by the body for energy. When blood glucose levels get too high, it can damage tissues and organs over time.

Carbohydrates

A class of food molecule that includes sugars, starches, and fibers.

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continued from page 1

food is likely high in sugar. The total amount of sugar in a food is listed under "Total Carbohydrate" on the Nutrition Facts label.

Many people try cutting back on calories by switching from sugar-sweetened to diet foods and drinks that contain low- or no-calorie sweeteners. These artificial sweeteners—also known as sugar substitutes—are many times sweeter than table sugar, so smaller amounts are needed to create the same level of sweetness.



Wise Choices Cut Added Sugars

- Choose water, fat-free milk, or unsweetened tea or coffee instead of sodas, sports drinks, energy drinks, and fruit drinks.
- Reduce sugar in recipes. If a recipe says 1 cup, use 2/3 cup.
- To enhance flavor, add vanilla, cinnamon, or nutmeg.
- Eat fresh, canned, frozen, and dried fruits without added sugar. Choose fruits canned in their own juice rather than syrup.
- Use fruits to top foods like cereal and pancakes rather than sugars, syrups, or other sweet toppings.
- Read the ingredients list to pick food with little or no added sugar.
- Use the Nutrition Facts label to choose packaged foods with less total sugar.

People have debated the safety of artificial sweeteners for decades. To date, researchers have found no clear evidence that any artificial sweeteners approved for use in the U.S. cause cancer or other serious health problems in humans.

But can they help with weight loss? Scientific evidence is mixed. Some studies suggest that diet drinks can help you drop pounds in the short term, but weight tends to creep back up over time. Rother and other NIH-funded researchers are now working to better understand the complex effects that artificial sweeteners can have on the human body.

Studies of rodents and small numbers of people suggest that artificial sweeteners can affect the healthful gut microbes that help us digest food. This in turn can alter the body's ability to use glucose, which might then lead to weight gain. But until larger studies are done in people, the long-term impact of these sweeteners on gut microbes and weight remains uncertain.

"There's much controversy about the health effects of artificial sweeteners and the differences between sugars and sweeteners," says Dr. Ivan de Araujo of Yale University. "Some animal studies indicate that sweeteners can produce physiological effects. But depending on what kind of measurement is taken, including in humans, the outcomes may be conflicting."

De Araujo and others have been studying the effects that sugars and low-calorie sweeteners might have on the brain. His animal stud-



Web Links

For more about sugar and sweeteners, click the "Links" tab at:
<http://newsinhealth.nih.gov/issue/Oct2014/Feature1>

ies found that sugar and sweeteners tap differently into the brain's reward circuitry, with sugars having a more powerful and pleasurable effect.

"The part of the brain that mediates the 'I can't stop' kinds of behaviors seems to be especially sensitive to sugars and largely insensitive to artificial sweeteners," de Araujo says. "Our long-term goal is really to understand if sugars or caloric sweeteners drive persistent intake of food. If exposed to too much sugar, does the brain eventually change in ways that lead to excess consumption? That's what we'd like to know."

Some research suggests that the intensely sweet taste of artificial, low-calorie sweeteners can lead to a "sweet tooth," or a preference for sweet things. This in turn might lead to overeating. But more studies are needed to confirm the relative effects of caloric vs. non-caloric sweeteners.

"In the long run, if you want to lose weight, you need to establish a healthy lifestyle that contains unprocessed foods, moderate calories, and more exercise," Rother says.

When kids grow up eating a lot of sweet foods, they tend to develop a preference for sweets. But if you give them a variety of healthy foods like fruits and vegetables early in life, they'll develop a liking for them too.

"It's important for parents to expose children to a variety of tastes early on, but realize that it often takes several attempts to get a child to eat such foods," says Bremer. "Don't give up too soon."

The key to good health is eating a well-balanced diet with a variety of foods and getting plenty of physical activity. Focus on nutrition-rich whole foods without added sugars. Get tips on healthy eating and weight control at <http://win.niddk.nih.gov>. ■

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<http://health.nih.gov>

Cold, Flu, or Allergy?

Know the Difference for Best Treatment

You're feeling pretty lousy. You've got sniffles, sneezing, and a sore throat. Is it a cold, flu, or allergies? It can be hard to tell them apart because they share so many symptoms. But understanding the differences will help you choose the best treatment.

"If you know what you have, you won't take medications that you don't need, that aren't effective, or that might even make your symptoms worse," says NIH's Dr. Teresa Hauguel, an expert on infectious diseases that affect breathing.

Cold, flu, and allergy all affect your **respiratory system**, which can make it hard to breathe. Each condition has key symptoms that set them apart.

Colds and flu are caused by different viruses. "As a rule of thumb, the symptoms associated with the flu are more severe," says Hauguel. Both illnesses can lead to a runny, stuffy nose; congestion; cough; and sore throat. But the flu can also cause high fever that lasts for 3-4 days, along with a headache, fatigue, and general aches and pain. These symptoms are less common when you have a cold.

"Allergies are a little different, because they aren't caused by a virus," Hauguel explains. "Instead, it's your body's **immune system** reacting to a trigger, or allergen, which is something you're allergic to." If you have allergies and breathe in things like pollen or pet dander, the immune cells in your nose and airways may overreact to these harmless substances. Your delicate respiratory tissues may then swell, and your nose may become stuffed up or runny.

"Allergies can also cause itchy, watery eyes, which you don't normally have with a cold or flu," Hauguel adds.

Allergy symptoms usually last as long as you're exposed to the allergen, which may be about 6 weeks during pollen seasons in the spring, summer, or fall. Colds and flu rarely last beyond 2 weeks.

Most people with a cold or flu recover on their own without medical care. But check with a health care provider if symptoms last beyond 10 days or if symptoms aren't relieved



by over-the-counter medicines. For more about when to see a doctor, go to www.cdc.gov/flu/takingcare.htm.

To treat colds or flu, get plenty of rest and drink lots of fluids. If you have the flu, pain relievers such as aspirin, acetaminophen, or ibuprofen can reduce fever or aches. Allergies can be treated with antihistamines or decongestants. See the "Wise Choices" box for more details.

Be careful to avoid "drug overlap" when taking medicines that list 2 or more active ingredients on the label. For example, if you take 2 different drugs that contain acetaminophen—one for a stuffy nose and the other for headache—you may be getting too much acetaminophen.

"Read medicine labels carefully—the warnings, side effects, dosages. If you have questions, talk to your doctor or pharmacist, especially if you have children who are sick," Hauguel says. "You don't want to overmedicate, and you don't want to risk taking a medication that may interact with another." ■



Wise Choices Cold, Flu, or Allergy?

Treatment depends on which you have. A health professional can help you choose the best therapy. Below are highlights from our chart at <http://newsinhealth.nih.gov/issue/oct2014/feature2>.

Common Cold

- Symptoms last up to 2 weeks
- Stuffy, runny nose; sore throat; cough
- Treated with rest, fluids, over-the-counter (OTC) medicines to ease symptoms

Seasonal Flu

- Symptoms usually last 1-2 weeks
- High fever (100-102 °F, or higher in youngsters), headache, aches and pains, weakness, exhaustion, cough, chest discomfort
- Treated with rest, fluids, OTC medicines, prescription antiviral drugs

Airborne Allergy

- Lasts as long as allergens (such as pollen, pet dander) are present
- Stuffy, runny nose; itchy, watery eyes
- Treated with antihistamines, decongestants, nasal steroids



Definitions

Respiratory System

The body parts that help you breathe, including your nose, throat, and lungs.

Immune System

Protects your body from invading germs and other microscopic threats.



Web Links

For more about colds, flu, and allergies, click the "Links" tab at: <http://newsinhealth.nih.gov/issue/Oct2014/Feature2>



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Oct2014/Capsule1>

Genetic Clues to the 2014 Ebola Outbreak

Scientists sequenced the **genomes** of nearly 100 samples of Ebola virus from patients in West Africa. The findings are helping researchers track the origin and spread of this deadly virus.

The 2014 Ebola outbreak is the largest in history. By late September, more than 7,100 Ebola infections and 3,300 deaths were reported by the World Health Organization. It's the first Ebola outbreak in West Africa and the first to affect major cities.

Ebola can spread from one person to another through direct contact with body fluids, such as blood or saliva. Infections can cause vomiting,

diarrhea, kidney and liver damage, and bleeding inside and outside the body. There are no approved drugs for Ebola infections. However, fast diagnosis and medical care can improve chances of survival.

To learn more about the recent outbreak, an international research team collected virus samples from 78 patients living near the origin of the 2014 outbreak. The scientists used advanced technologies to quickly and accurately analyze the viral genomes. The results were compared to Ebola genomes from earlier outbreaks.

Analyses showed that the strain responsible for the 2014 outbreak likely moved from Central to West Africa over a 10-year period. The team also found that the virus was brought into the African country of Sierra Leone by 14 people. These people had all attended the funeral of a healer who

treated Ebola patients in a nearby country.

The research shows how “genomic surveillance” can help track and possibly help slow the spread of Ebola as the outbreak continues. Understanding the genetics of the virus will also help scientists develop new and improved drugs and vaccines. NIH recently announced the launch of an early-stage trial to begin human testing of an experimental vaccine. ■



Definitions

Genome

The entire set of genetic instructions in an organism or virus.

NIH Health Information at Your Fingertips

Can you separate facts from myths about weight loss, nutrition, and physical activity? How do you recognize a heart attack or stroke? How many drinks is too many?

With so much new health and science information coming out every day, it can be hard to stay up to date. To help keep you informed, NIH has created a free, twice-a-month email newsletter called *NIH Health Information*. Read about NIH-funded scientific findings, scan through popular health topics, and find links to re-

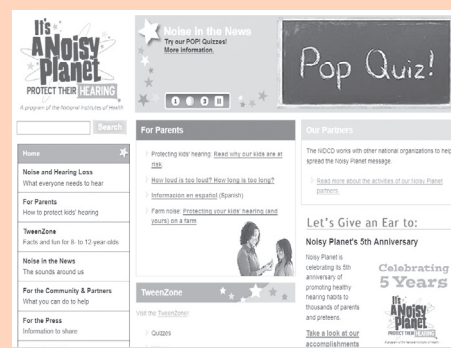
sources that can help you improve your health. Each edition highlights useful, trustworthy information and resources on a range of topics such as nutrition, diabetes, and brain health.

To get the *NIH Health Information* e-newsletter, visit <http://health.nih.gov> and click on the blue “subscribe” button on the left side of the screen. Bookmark or Favorite this page and visit often to find updated health information from across NIH’s institutes and centers, as well as resources about health topics in the news. ■

Featured Website It's a Noisy Planet

<http://www.noisyplanet.nidcd.nih.gov>

Kids and teens are often exposed to noise levels that could permanently harm their hearing. It could take a long time before you even notice damage has been done. Learn about the causes and prevention of noise-induced hearing loss, so your kids—and you—can have healthy hearing for life.



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