

Name _____

Sugary Sport Drinks?

As you read the following essay, circle any words that are new to you and underline at least five key points.

In 1971 water bottles and sport drinks had not been invented yet, so when 14-year-old Lynne Cox and her teammates prepared for their 26-mile (41.6-kilometer) swim across the Catalina Channel in California, they had to figure out how to get the fluids and energy they needed during their 12 1/2 hours in the water. To complicate matters, the water temperature was 55 to 60 °F (13 to 16 °C), so they had to worry about how to maintain their body temperature as well. "We . . . filled plastic ketchup bottles with hot tea with sugar, warm orange juice, beef broth, hot apple cider, hot chocolate, and coffee loaded with sugar. We were trying to figure out what we could use on the Catalina crossing to boost our blood sugar and replace lost heat. With salt water in our mouths from swimming in the sea, the orange juice was absolutely disgusting, beef broth was bad, and hot chocolate was a real mistake because it contained milk solids, which were known to make swimmers nauseated. We narrowed our choices to coffee, tea, and hot cider." A year later, when Lynne broke the world record for crossing the English Channel, she drank hot apple juice and ate oatmeal cookies that were tossed to her.

Today long-distances athletes and others working for long periods in the heat are lucky; they can go to any corner store and purchase sport drinks that are specially formulated to quickly deliver sugar to working muscles and replenish the water lost through sweating. The American College of Sports Medicine recommends drinking sport drinks when you exercise strenuously for more than 60 minutes. They recommend drinking water during shorter bouts of exercise or at times when you are physically active at more moderate intensities, such as playing baseball or riding your bike for fun. Sport drinks do not improve your performance in these situations. You don't need the sugar; your body has enough stored energy. During recreational activities that last several hours, it's best to stop for a healthy snack to refuel your body.

As sport drinks have become more plentiful, many children and adults are drinking when they don't need them. They are also drinking more of other kinds of sugar-sweetened beverages, such as soda and fruit punches. Youth currently drink twice as much soda as milk. The excess sugar in these drinks is creating health problems in children and teens that used to show up only in older adults.

Sugar and Body Chemistry

Glucose, fructose, maltose, and sucrose are examples of sugars commonly found in the foods and drinks we consume. They are added in large quantities to soda, sport drinks, cookies, and candies, but occur naturally in dairy foods, fruits, vegetables, and other foods made from plants. Sugars are simple carbohydrates. They are composed of one or two small molecules that contain carbon, oxygen, and hydrogen.

Because of their small size and shape, sugar molecules are easily transported through the cells lining the small intestines and into the blood. Complex carbohydrate, such as the starch found in grains and vegetables, is made up of long chains of simple sugars linked together. These large molecules must be broken down into simple sugars by digestive enzymes in the small intestines before they can enter the blood. Sugars dissolve in blood and are pumped throughout the body. After a meal, blood sugar levels rise, and this stimulates cells in the pancreas to release a hormone called insulin into the blood. Insulin binds to cells in muscle, liver, and many other tissues, making their membranes more permeable to sugar. It acts like a doorman helping sugar get out

(continued)

Sugary Sport Drinks? *(continued)*



of the blood and go inside the cells. Cells break down the sugar molecules and use the energy released to grow, to reproduce, and for many other functions. The brain uses sugar molecules exclusively for energy. During exercise, sugar supplies muscle cells with most of the energy they need for contraction.

Health Risks

Maintaining normal blood sugar is vital to health; eating sugar is not. Scientists have discovered that regularly drinking sugar-sweetened beverages increases the risk of gaining excess weight and developing type 2 diabetes, a chronic disease that used to be called adult-onset diabetes, but is now showing up in youth. This type of diabetes is associated with obesity, lack of exercise, and old age and it tends to run in families. It should not be confused with another form of diabetes called type 1, or juvenile, diabetes. Type 1 diabetes typically shows up in children or young adults and is thought to be triggered by exposure to environmental factors, possibly an unknown virus.

Diabetics have difficulty keeping their blood sugar at a healthy level. After a meal or drink that contains carbohydrate, blood sugar levels rise. In healthy people, this stimulates the pancreas to release insulin into the blood, which in turn helps sugar enter cells and returns blood sugar back to premeal levels. Diabetics either don't make enough insulin or are resistant to the insulin they make. As a result, sugar builds up in their blood. With sugar unavailable to the cells, the body breaks down fat for energy, producing chemicals that make the blood more acidic, which can be fatal. Chronic high blood sugar can cause heart disease, blindness, kidney disease, and lower-extremity amputations.

To help prevent type 2 diabetes, do the following:

- Eat a healthy diet, including plenty of whole grains, vegetables, and fruits. Limit foods that are high in added sugars to small quantities, and don't have them every day.
- Get plenty of exercise.
- Keep a healthy weight. If you're overweight, ask for help from your parents and your doctor to get to a healthier weight.
- Know your family history. If diabetes is in your family, be sure to get your blood checked periodically as you get older to monitor your blood glucose levels.

Sport drinks were plentiful when Lynne Cox swam the first Antarctic mile in 2002, but she didn't need them. The meal she ate before the swim provided her with all the energy she needed during her 25-minute swim in water that was 32 °F (0 °C). Sport drinks are only recommended for strenuous exercise lasting longer than 60 minutes.

Nutrition Tips for Improving Your Fitness and Performance

- Drink plenty of water before, during, and after physical activity.
- Eat foods from each of the five food groups at every meal.
- Choose whole grains over processed grains.
- Choose plant oils over animal fat.
- Time your meals so that you eat 90 minutes or more before a competition.

(continued)

Sugary Sport Drinks? *(continued)*



Check What You Learned

1. In which of the following situations should you drink water? In which would a sport drink be a good choice? Write a W (water) or S (sport drink) in the blank to indicate your response.
_____ Shooting baskets for a few hours after school
_____ 60-minute soccer or basketball game
_____ Seven-mile hike
_____ Riding your bike around town with friends
_____ Six-hour sports camp held outside in the hot summer sun
_____ Two-hour bike race
2. Describe what happens to blood sugar and blood insulin levels immediately after drinking a sugary drink. How does insulin help to maintain blood sugar at a healthy level?
3. Why do diabetics have trouble maintaining their blood sugar at a healthy level?
4. List four things you can do to prevent developing type 2 diabetes.
5. List four or more characteristics of sugar molecules. Include information about their size, shape, chemical structure, and function in the body.

Making Connections

Interview your extended family. Does anyone have type 2 diabetes? Why is this important for you to know?