

What to eat before and after exercise

By Sharon Howard, R.D., M.S., C.D.E. FADA

Timing is important

Scheduling exercise into a busy lifestyle is one challenge, and planning meals and snacks around the exercise is a second one. Eating too much food, or the wrong food before exercise can impair your performance or cause indigestion, sluggishness, nausea, and vomiting. On the other hand, if you haven't eaten in six hours and try to work out, you may feel weak and unmotivated. Timing is important --a big breakfast may be troublesome if you are going for a morning run, but it is fine for a jog before lunch.

Your goal is to have fueled your body with nutritious food that is no longer present in your stomach when you work out. The pre-exercise food prevents hunger during exercise. Carbohydrates are easily digested, but foods high in protein and fat will linger in the stomach for some time, depending how much you ate. Large meals take longer to empty from the stomach, about four to six hours.

Snacks, depending on their content, take about 1/2-1 hour to leave your stomach.. Eating a high carbohydrate snack two hours before exercising can leave you ample energy and a calm stomach for a great workout. Many athletes avoid food within two hours of a very hard workout, but can tolerate a lighter snack within one to two hours of a light workout..

Pre-Exercise eating tips

Experiment with your eating schedule to see what works best for you. Keep these tips in mind:

- A high carbohydrate, low fat snack is easily digested and normalizes blood sugar
- Avoid fatty meals or snacks, because they delay stomach emptying
- Meal should be moderate in protein, just enough to satisfy hunger
- Drink lots of fluids. Your snack can be a liquid meal such as a fruit shake (See recipe)
- A light workout can be preceded with a light snack, but leave more lead time for intense workouts

Ten snack ideas before a workout

The snack should contain 40 to 100 grams of carbohydrates, and low in fat. Too much fiber may stimulate the digestive system at an inappropriate time.

- Milk and 12 crackers, 2 tbsp. peanut butter (54 grams carb)
- Banana and yogurt (56 grams)
- Bagel with jelly and juice (83 grams)
- Cereal (1 oz.) and milk (34 grams)
- Juice and pretzels (50 grams)
- Sports drink, 16 oz (30 grams)
- Sports bar and water (20-50 grams)
- Fresh fruits such as oranges or bananas (15-25 grams per)
- Low-fat vegetable soup, chicken noodle or tomato and crackers (40-50 grams)
- Blueberry muffin or fig bars and milk (45 grams)

What about sugar before exercise?

Some athletes can consume sugared soft drinks just before exercising, but they are taking a risk of causing hypoglycemia or low blood sugar. About ten minutes after starting out, a sugar low will hit with lightheadedness and fatigue. The rush of sugar causes a rush of insulin, and with the muscles using glycogen so quickly, low blood sugar results. This is not common, but you know if you have this problem.

Will eating a candy bar before exercise give the quickest energy? No, but maybe a tummy ache. The fat in a candy bar may delay stomach emptying. Most of the energy used during your workout is stored glycogen, which comes from what you've eaten for days before you exercise. Also, how you replenished fluids and fuel after your last workout is important now.

What about food during exercise?

During exercise, your body uses sugar without needing insulin, so a sip of sweetened drink during exercise is no problem, but water is best. Exercise that exceeds one hour may require carbohydrate intake, to delay fatigue. Before getting too tired, consuming 30 grams of carbohydrate every 30 minutes can provide an extra boost. However, if the drink is too high in sugar, the liquid will remain in the stomach longer and cause sloshing. Sports drinks are designed with a small amount of quickly absorbed carbohydrate and electrolytes to replenish sweat and blood sugar during exercise. For a short workout, less than 60 minutes, water is adequate. See next week's article on fluids and sports drinks.

Recovery eating

After exercise, athletes need carbohydrate and fluid to replace glycogen and water losses during the exercise. They will recover faster if they eat a high carbohydrate diet—from 250 to 550 grams of carbohydrates a day. The muscles store more glycogen immediately after exercise than they do later.

Eat or drink carbohydrates as soon as you can tolerate them. Plan to consume 1.5 grams CHO/gm body weight within the first hour post exercise. Juices work great because of the carbohydrate and fluid, and then add solid foods one to three hours later. Sports drinks have half the carbohydrates as juices, and so are more appropriate during exercise. What you eat after exercise is very critical to your performance the next day, since the body needs carbohydrates to restock your glycogen stores. Protein at the post-game meal (two hours later) is also important to repair and build the muscle tissue.

Here is an easy recipe for a pre-exercise snack from the popular book by Nancy Clark, sports nutritionist, called the Sports Nutrition Guidebook.

Fruit Smoothies

- 1/2 cup plain, low fat yogurt
- 1/2 cup fruit, fresh or canned
 - 1 cup fruit juice

Place all ingredients in blender and whip until smooth. Add ice if desired. 250 calories, 50 grams carbohydrate, 5 grams protein, and 3 grams fat.

You can use bananas and strawberries, orange juice and pineapple, or use milk or soy milk for the yogurt. To increase protein content, add powder skim milk or soy protein powder.

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Sports Nutrition - Carbohydrate - Carbs

Carbohydrate is arguably the most important source of energy for athletes. No matter what sport you play, carbs provide the energy that fuels muscle contractions. Once eaten, carbohydrates breakdown into smaller sugars (glucose, fructose and galactose) that get absorbed and used as energy. Any glucose not needed right away gets stored in the muscles and the liver in the form of glycogen. Once these glycogen stores are filled up, any extra gets stored as fat.

Glycogen is the source of energy most often used for exercise. It is needed for any short, intense bouts of exercise from sprinting to weight lifting because it is immediately accessible. Glycogen also supplies energy during the first few minutes of any sport. During long, slow duration exercise, fat can help fuel activity, but glycogen is still needed to help breakdown the fat into something the muscles can use.

Adequate carbohydrate intake also helps prevent protein from being used as energy. If the body doesn't have enough carbohydrate, protein is broken down to make glucose for energy. Because the primary role of protein is as the building blocks for muscles, bone, skin, hair, and other tissues, relying on protein for energy (by failing to take in adequate carbohydrate) can limit your ability to build and maintain tissues. Additionally, this stresses the kidneys because they have to work harder to eliminate the byproducts of this protein breakdown.

Carbohydrate has other specific functions in the body including fueling the central nervous system (CNS) and brain.

Storing Carbohydrate

One gram of carbohydrate provides four calories of energy. Athletes often talk about carbohydrate loading and carbohydrate depletion which refers to the amount of carbohydrate energy we can store in our muscles. This is generally around 2,000 carbohydrate calories, but we can change this number through depletion and loading. During depletion (from diet, exercise or a combination) we use up the stored carbohydrate.

If we don't replenish these stores, we can run out of fuel for immediate exercise. Athletes often refer to this as "bonking" or "hitting the wall." In the same way, eating large amounts of

carbohydrates can increase these stores. This is often referred to as carbohydrate loading or carbo-loading. Our maximal carbohydrate storage is approximately 15 grams per kilogram of body weight [15 grams per 2.2 pounds]. So a 175-pound athlete could store up to 1200 grams of carbohydrate [4,800 calories]; enough energy to fuel high intensity exercise for quite some time.

How Carbohydrate Fuels Exercise

Carbohydrate stored as glycogen is an easily accessible source of energy for exercise. How long this energy supply lasts depends on the length and intensity of exercise and can range anywhere from 30 to 90 minutes or more. To avoid running out of energy during exercise, start with full glycogen stores, replenish them during exercise and refill them after exercise to be ready for the next workout.

Types of Carbohydrate

Carbohydrates are also divided into simple and complex forms. Simple sugars (carbs) are absorbed and converted to energy very quickly and provide a rapid source of energy. Fruit and energy drinks are a good source of simple carbohydrates.

Complex carbohydrates take a bit longer to be digested and absorbed into the body. They also take longer to breakdown and therefore provide energy at a slower rate than simple sugars. Examples of complex carbohydrates are breads, rice and pasta. Starch and fiber are also considered complex carbohydrates but fiber can not be digested or used for energy. Starch is probably the most important energy source in an athlete's diet because it is broken down and stored as glycogen. Foods high in starch include whole grain breads, cereals, pasta, and grains.

By [Elizabeth Quinn](#), About.com

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