Shoul you Eat Before or After Exercise?
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Q: Is it better to eat before or after exercising?

A: Many misconceptions surround eating and exercise. Some people avoid food before a workout because they worry they'll get nauseated or have cramps. Others don't eat in the morning because they think they'll burn more fat if they move on an empty stomach. Some athletes assume that hunger pangs before practice are a good thing, because they think that their body is diverting all its energy to the workout instead of digestion.

None of these beliefs are true.

The bottom line is this: When you expend energy by exercising, you need to consume extra energy to fuel the activity. How much you should eat and at what time of day depends on the type and duration of your workout, as well as when you last ate and what was on the menu.

Ideally, how much energy your body uses (how many calories you burn) and how much energy your body takes in (how many calories you eat) should be in balance all day. Keep in mind that your body burns around 100 calories an hour at rest and during sleep, so you don't just need energy for exercise, you need food throughout the day to fuel being alive. If you are highly active, if you eat big meals, or if you go for long periods without eating, you can upset this balance and cause extreme energy highs (surpluses) or lows (deficits.)

When you first wake up, you are likely to be low on energy. It works like this: If, the night before, you ate dinner at 7 p.m. and then nothing else until breakfast at 7 a.m., you would have gone 12 hours without added fuel. Your body may have burned around 1,100 calories during this period. Most of the fuel used would have come from your stored fat and glycogen (carbs).

But you have a limited supply of carbs because they are stored only in small amounts in your liver and muscles. Even though the body has plenty of fat stored, for fat to be "burned", or metabolized, carbs need to be present. Often, the liver's carb stores are nearly depleted by the morning, so many people may wake up in the morning in a state of energy deficit, where there are not enough carbs to provide energy and to help utilize fat.. So they need breakfast to infuse more energy into their body.

If you skip breakfast and do a tough workout, you launch a depleted body into even greater depletion. Say you burn 500 calories during the workout. By the time you eat later that morning, you may have dipped into an energy deficit of 1,600 calories (that is, 1,100 calories burned while you sleep, plus 500 from the workout). Now your body is famished for fuel. However, you may not feel hungry in this state (known as "ketosis") because your body has shifted to starvation mode to preserve its resources. Diminished hunger is

one of the side effects. But a lack of stomach rumblings doesn't mean your body doesn't need fuel—it does. In fact, at some point it will demand more fuel—you'll likely binge and go into a huge energy surplus to compensate. This ends up being a roller-coaster calorie ride for your body.

In another scenario, if you overeat and are inactive, you can find yourself in a state of energy surplus. So let's say you eat a big lunch at 1 p.m. (cheeseburger, fries, shake) and take in around 1,200 calories. Then you sit at your desk and burn about 500 calories until it's time for dinner at 6. In this case, you may enter the meal in a energy surplus of 700 calories (1,200 calories from lunch, minus the 500 you burned sitting at your desk). If for dinner, you ate another big meal of 1,000 calories (fettuccini alfredo, a soda and dessert), you could end up with a larger surplus of around 1,700 calories. If you remain sedentary for the rest of the evening, not much of that will be burned off. Then the next morning if you wake up to a big breakfast, your body stays in positive energy balance. This is a recipe for weight gain.

Dramatic calorie highs and lows aren't good for you. Researchers at the University of Georgia studied the eating patterns of athletes and found that that men and women had higher levels of body fat when their eating patterns fluctuated wildly throughout the day, even if they were in energy balance by the end of the day. In addition, they had worse muscle mass, lower energy levels and poor mental focus compared to athletes who ate consistently over the course of the day. Those athletes who ate regular, small meals, and more before, during and after intense workout sessions, showed the best performance in their sports and were the leanest.

The moral? For optimum performance, match your energy intake to your hourly energy needs. Of course, short of living in a laboratory, there's no sure-fire way to know your precise energy-balance status. Still, you can avoid drastic energy fluctuations by eating small-to-moderate sized meals every three or four hours. And if you are going to do intense or long exercise sessions, eat more before and during to compensate.

Pre-Workout Snacks

Don't enter a workout hungry. If you start exercising in an energy deficit, your body is likely to preserve fat and perform poorly. If you tend to bonk out midway through a hard session, low energy may be the culprit. Quick absorbing carbs with a high glycemic index will give you fast fuel. So before a tough workout, have a sports drink, juice, fruit, bread or pasta to take in some calories. Depending on the intensity and type of activity you are doing, you may be less likely to have an upset stomach if you avoid high-fiber foods at this time. Or if you have them, wait an hour or two to digest before you start your workout. If you need to grab a snack minutes before a workout, chew thoroughly and go for a quick-digesting, high-carb food. But, if you are merely going on a moderate-paced walk for 45 minutes, you probably don't need extra food unless you're heading out first thing in the morning. But if you are going to do two spin classes, an 8-mile run or something equally vigorous, fuel up beforehand.

During a Workout

Again, what and how much you need depends upon what you are doing. If the workout is intense and lasts from 60 to 90 minutes or longer, you probably need extra fuel. A sports drink or energy gel is the easiest absorbing solution, although bread, juice, fruit or an energy bar work too.

The Post-Exercise Energy Window

If you went on an easy walk for an hour, you don't need to eat extra. But if you had a high-intensity workout lasting 60 to 90 minutes or longer, then it's crucial to eat afterwards. Within the first 45 minutes post-exercise, there is a "metabolic window." This means that enzymes that replenish muscle carbs are at their highest levels. Plus, insulin, which rebuilds protein stores, is at peak levels. So eating a carb-and-protein mix (peanut butter sandwich, yogurt with fruit, bagel with cream cheese, or a handful of nuts) at this point will maintain muscle, replenish glycogen stores and reduce the amount of fat your body stores. Even a sport drink or a piece fruit are a good idea if you don't have something more complex available. (These calories are needed to recover, so they are less likely to be stored as excess fat.)

The problem is, it may be an hour or more before you get a chance to eat, especially if you're at the gym and need to grab a shower before a long journey home. Missing the metabolic window is bad news: If you delay refueling, you slow carb replenishment by 50 percent and protein repair by 80 percent, according to John Ivy, an exercise physiologist at the University of Texas and the author of *Nutrient Timing.* And that means that you may be sluggish and fatigued during tomorrow's workout.

Sometimes an immediate side effect of a tough workout is that you are not hungry. But, you still need some calories. So drink juice or a sports drink at the very least. If you experiment with different food options, you should be able to find something that sits well with your stomach and improves your performance.