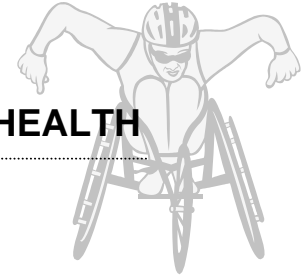
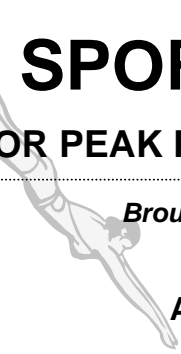




SPORTS NUTRITION

TIPS FOR PEAK PERFORMANCE AND GOOD HEALTH

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A Look at the Big Picture

Superior performance is your number one goal today, but lifelong health and disease prevention is your number one goal overall. Why not choose a diet that supports both goals? Choose foods that are fresh, wholesome, minimally processed, and high in nutrients. Such a diet reduces your risk of chronic disease and increases longevity.

CARBS: Fuel of Champions

Most athletes know that carbs are the fuel of choice. Since the depletion of carbohydrate stores impairs athletic performance, athletes should strive to optimize carb stores before, during, and after exercise. And in general, for meals not immediately preceding an event, complex carbs are best. These include whole grains (grains with the bran and germ still intact, like whole wheat, brown rice, barley, and oats), vegetables, beans, and fruits. Active people should consume between 55% and 70% of their total calories from carbohydrate. Most athletes should be getting 6 to 13 grams per kilogram of body weight, depending on the number of hours of training (7 g/kg for one hour of training per day; 8 g/kg for 2 hours; 10 g/kg for 3 hours, and 12-13 g/kg for 4 hours). During exercise lasting over 1 hour, strive for 30-60 grams of carbohydrate per hour.

What about glycemic index (GI)? The GI is the response of blood glucose from a fixed carbohydrate intake. In general, in a varied diet for healthy people, GI plays little role, since mixing foods changes GI quite drastically. However, glycemic response to carbohydrates is important to consider for performance. For this reason, different types of carbs, based on their GI, are commonly used before, during, and after exercise.

Some athletes are sensitive to blood sugar drops during exercise. For these individuals, low-GI carbs are best before exercise. Low GI means a relatively slow blood glucose response, so the energy from the food will last longer. For athletes who are not as sensitive to blood sugar declines during exercise, medium to high GI carbs seem to work best. During exercise, high GI carbs are recommended for quick absorption, and after exercise, high GI carbs are effective for glycogen replenishment. See the table below for some common foods and their relative GI levels.

High Glycemic Index Foods	Medium Glycemic Index Foods	Low Glycemic Index Foods
glucose or maltodextrin, carrots, potatoes, corn flakes, white bread, most refined breakfast cereal, corn chips, sports drinks	rice cakes, bananas, mangoes, saltines, white or wheat bread, soda, high-fiber cereal, table sugar, ice cream, oatmeal, cookies, sweet potatoes, potato chips, bagels	white or brown rice, plums, dairy products, apples, beans (chick peas, lentils, etc.), pasta, oranges, plums, peaches, fruit sugar, nuts

from Am J Clin Nutr. 1995;62:871S-893S

Of course, everyone is different, and athletes should try different combinations and amounts of carbs before, during, and after exercise to determine which helps prevent nausea, improve energy, minimize gastrointestinal discomfort, and ward off hunger.

Fats: Avoid, or embrace?

For years, athletes have been told that to keep a lean physique, stay energetic, the diet should be as low in fat as possible. Nutritionists now know that this recommendation is obsolete. There still should be a limit on fat – about 30 percent of total calorie intake – but in light of emerging nutrition research, more attention than before is focused type of fat, which is just as important as amount. Fat won't make you fat unless you're getting more calories than your body can burn. Insufficient fat intake in athletes can lead to fatigue, dry skin, hair, and nails, vitamin and mineral deficiencies, and reproductive disorders.

There are two main classes of fats: unsaturated, and saturated. The unsaturated fats are from plant sources and fish, and include the monounsaturated fats (from olives and olive oil, walnuts, almonds, and fatty fish) and the polyunsaturated fats (from soybean oil, corn oil, and peanuts). These fats are important for optimal health, and play a role in nutrient absorption and transport, energy utilization, and cell protection. Saturated fats are mainly the animal fats (from dairy products, meat, and poultry skin) and the trans fats (technically not saturated, but they act like saturated fats in foods). Trans fats are the result of the addition of hydrogen molecules to liquid fat to make it solid (this is done in the food laboratory and are seen as "partially hydrogenated oil" on food labels). Some examples are shortening, margarine, and the fats in foods like microwave popcorn, pastries, and cookies. Trans fats are useful to food manufacturers because it increases the shelf life and texture of the fat, but they are dangerous for us because they increase risk of diseases like cancer and heart disease. Thus, it is important to focus on the healthy fats found naturally in foods like avocados, olives, nuts, and seeds, and in liquid oils and fish (vegetarians can use flax seeds and olive oil instead of fish).

Protein: The Bottom Line

No doubt about it, active people need plenty of protein to rebuild bone and muscle, fight fatigue, and feel good. While most people need about 0.8 grams of protein per kilogram of body weight per day, endurance athletes need 1.2 to 1.4 g/kg. (To put this into perspective, a 175 pound athlete needs about 100 grams of protein a day). Will more hurt? Yes, if the extra protein is at the expense of carbs and fat. And an over-dependence on protein foods and supplements can lead to dehydration, calcium loss, fatigue, vitamin and mineral deficiencies, and compromised performance. Proportion and type of protein are keys to the best choices. Ideally, protein-rich foods should take up about ¼ of your plate at mealtimes. The other ¾ should be complex carbohydrates and some fat. So, for example, if your dinner is turkey breast, mixed veggies, salad with dressing, and roasted potatoes, do about ¼ of each of these foods. The other issue is type of protein. Remember, protein does not equal meat, poultry, and fish only. Almost all foods contain at least some protein, and this is why a protein deficiency occurs only in people who are not getting enough calories. See the box below for a list of healthy, protein-rich foods. Try to get a wide variety of protein-rich foods. Non-meat, non-dairy proteins are a nutritional boon because they also have plenty of fiber, some complex carbs, some healthy fats, and heart-healthy nutrients that are lacking in animal foods.

Foods Supplying About 8-10 Grams of Protein

2 Tbsp peanut butter, 3 Tbsp almond butter, 3 Tbsp sunflower seeds, ¼ cup most types of beans; ½ cup hummus, 4 ounces of tofu, 1/3 cup soybeans, 8-12 oz. soy milk, 8 oz dairy or soy yogurt, 1 veggie hot dog, 1 veggie burger, 2 oz tempeh, 2 potatoes, 1 cup pasta, 3 bananas, 1 oz chicken or beef, 1.5 oz fish.

Fluids

As most active people are aware, exercise greatly increases your need for fluids. And quenching thirst does not always provide sufficient fluid replacement. Risk of dehydration includes fatigue, constipation, nausea, vomiting, heat stress, and compromised athletic performance. Adequate fluid intake before and during exercise helps to lower heart rate, body temperature, and perceived exertion, yet increases stroke volume, cardiac output, and performance. According to the American College of Sports Medicine, athletes should drink about 16 fluid ounces of fluid about 2 hours before exercise and 8 to 16 oz every 15 minutes before exercise; 4 to 8 oz every 15 minutes during exercise, depending on fluid loss (during exercise, the right amount is often the maximum amount tolerated); and after exercise, athletes should drink 24 oz per pound of body weight deficit. Using a sodium-containing sports beverage post-exercise may help speed rehydration. Unsweetened, caffeine-free beverages are best, but if sweetened and/or caffeine-containing beverages are more easily tolerated, they are better than none at all. A good way to tell if you're getting enough fluid is to check that you produce light-colored urine.

Vitamins & Minerals

A balanced diet provides all the necessary vitamins and minerals for performance athletes. While the need for B vitamins is higher in active than inactive people, they are obtained easily from a healthful, mixed diet. A B vitamin supplement is probably not necessary, but not harmful in the recommended dose on the label. Women athletes may have an increased need for iron. They should eat iron-rich foods (lean red meat, leafy greens, beans, enriched cereals) and get their iron checked regularly. Exercise does not increase the need for calcium or other vitamins and minerals, but getting enough is very important. A well-planned diet provides all these nutrients; see a dietitian if you think you may need supplements.

Online Sports Nutrition Resources

General Tips:

- Try to avoid depending on nutrition information only from web sites that sell supplements or books. This information is not necessarily wrong, but may be biased. Get a more balanced viewpoint by reading information from several reputable sources.
- Use athlete-specific bulletin boards and online chats to learn what others are doing, and to just have some camaraderie as you train for your event.
- Use common sense and don't post information about yourself online that you wish to keep private.

Sports Nutrition Web Sites:

<http://www.sportsci.org>
<http://www.physsportsmed.com>
<http://poweringmuscles.com>

<http://www.runningnetwork.com>
<http://www.acefitness.org>
<http://www.gssiweb.com/sportssciencecenter>

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