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## Fueling Distance Runners

Distance running includes endurance events such as the 10 kilometer (km) (6.2 miles), the half marathon (21 km or 13.1 miles), and the marathon (42 km or 26.2 miles). Energy (calorie) needs for running depend on body weight, duration and intensity of running, and training schedule.

Recreational runners have lower energy needs than competitive distance runners, who often log more than 100 miles per week in training. Leanness and low body weight are desirable for distance runners, because body fat does not generate power and increases the load to carry when running.

Competitive distance running is a high-calorie-burning sport. Developing a nutrition plan to meet the demands of the sport and fuel you through long training runs is a must. Good nutrition may not make an average runner a great runner, but poor nutrition can make a great runner average.

USA Track and Field is the national governing body for elite track and field and distance runners ([www.usatf.org](http://www.usatf.org)).

## Fueling Strategies

Matching training and fueling strategies helps distance runners stay strong through long training runs. Maximizing muscle glycogen (carbohydrate stored in muscles) through timing meals to match demands of the sport can be the difference between finishing strong or not finishing at all.

The nutrients that provide energy are carbohydrate, protein, and fat. The amounts of each nutrient you need to fuel your practice and competition are given below.

### Carbohydrate

Carbohydrate should make up most of your diet. During intense training periods, when training for 1 to 3 hours each day, eat 2.7 to 4.5 grams of carbohydrate per pound of body weight per day (6 to 10 grams per kilogram). For example, a 115-pound runner would need 310 to 517 grams of carbohydrate a day. On less intense training days or when sidelined by injury, you only need 1.4 to 2.3 grams of carbohydrate per pound (3 to 5 grams per kilogram).

Choose high-quality carbohydrate foods such as whole grain breads and cereals, rice, pasta, starchy vegetables, whole or dried

These foods have **15 grams** of **carbohydrate**:

- 1 slice bread
- 1 6-inch tortilla
- ½ cup corn
- ½ cup mashed potatoes
- ½ medium baked or sweet potato
- ⅓ cup rice
- 3 cups popcorn
- 1 small apple
- 15 grapes
- 2 tangerines
- 2 tablespoons raisins
- ½ cup orange juice
- 3 cups green beans
- 1¼ cups milk or yogurt

fruit, and low-fat milk and yogurt. Eat fewer refined carbohydrates and sweets such as pastries, cookies, cakes, candy, sugar-sweetened soft drinks, fruit drinks, tea, and specialty coffee drinks.

These foods have **7 grams of protein:**

- 1 ounce cheese
- 1 ounce beef, pork, chicken, or turkey
- ¼ cup cottage cheese
- ½ cup black beans or kidney beans
- 1 whole egg
- 2 tablespoons peanut butter
- 1 cup milk or plain yogurt

## Protein

Protein provides the building blocks for muscle mass and for healthy growth and development. You need 0.6 to 0.8 grams per pound (1.3 to 1.8 grams per kilogram). For example, a 115-pound runner would need 69 to 92 grams of protein a day. Eating more protein than the recommended amount will not build lean mass faster.

Choose lean protein foods such as lean beef and pork, chicken and turkey, eggs, and low-fat dairy foods. Nuts are a good source of protein and contain healthy fats. Eat fewer high-fat protein foods such as regular burgers, brisket, ribs, sausage, and full-fat cheeses and dairy foods.

## Fats

There is no specific recommendation for fat for runners, but healthy fats should be a part of every athlete's diet. Healthy fats include olives and olive oil, nuts and nut butters, avocado, and vegetable oils (such as canola oil.)

## What Should Runners Eat Before and After a Workout?

When possible, eat 3 to 4 hours before a long training run or competition. Aim for a low-fat meal with about 200 to 300 grams of carbohydrate and about 30 grams of lean protein. This will ensure you have enough fuel on board but will leave time for your stomach to empty before you start your run. A turkey sub sandwich with baked chips and a side of fruit or a grilled chicken wrap on a flour tortilla with pretzels and fruit juice or low-fat milk are examples of meals that will meet the energy demands of a long training run or competition.

If there is not enough time to eat 3 to 4 hours before a run or a race, eat a snack 1 to 2 hours before practice or competition. Good choices include juice, fruit, milk, granola or cereal bars, a small bagel with peanut butter, cheese and crackers, a bowl of cereal, or yogurt. If there is less than 1 hour before exercise, liquids, such as a sports drink or a low-fat liquid meal replacement, may be the best choice.

For training runs longer than 1 to 2 hours, try to eat 30 to 60 grams of carbohydrate every hour. Good choices for snacks include sports drinks, which provide carbohydrate, fluid, sodium, and potassium, and energy gels or chews with water.

After practice, recover with a carbohydrate- and protein-rich snack. Carbohydrate replaces muscle glycogen that was lost during a long training run or race, and protein stimulates muscle

protein repair. Good choices include a turkey or grilled chicken sandwich, a slice of cheese pizza, low-fat chocolate milk, cottage cheese and fruit, or cheese and crackers. If you are running the next day, start your recovery within 30 minutes after training. If the following day will be a rest day, add recovery foods to your next meal.

## **Vitamins and Minerals**

Runners can get all the vitamins and minerals they need by making healthy food choices and eating a variety of foods. Have at least 5 servings of fruits and vegetables each day. Adding berries to breakfast cereal, dried fruit to trail mix, frozen fruit to plain or vanilla yogurt, side salads with meals, vegetables on sandwiches, and salsa on baked potatoes and snacking on fresh fruits and vegetables will help you get all the nutrients you need.

Female distance runners should pay extra attention to choosing iron-rich and calcium-rich foods. These nutrients are needed in larger amounts, especially during teen years. Lean beef in a stir-fry, dark-meat chicken or turkey, kidney beans and black beans, and breakfast cereals fortified with iron are good choices. For calcium, choose low-fat milk (cow's milk or soy, rice, or almond milk), low-fat cheese, yogurt, almonds, leafy green vegetables, orange juice with added calcium, or smoothies made with milk or yogurt.

## **Hydration Strategies: What Should Runners Drink?**

Running can be hard, sweaty work, especially when you're running in the hot sun or on warm, humid days in the summer months. Losing just 2% of your body weight can impair performance. That equals about a 2-pound loss in a 115-pound runner.

Water is best for most athletes. Plan to drink about 2 cups (16 ounces) of water 2 to 3 hours before a training run or race. Then drink 1 cup (8 ounces) of water 10 to 20 minutes before running. If your training run is long, drink about 1 cup of fluid every 10 to 20 minutes during your run. Carry a sports bottle filled with water or know where to get water along your route.

Sports drinks are a good choice when you have hard training runs lasting longer than 1 hour or if you sweat heavily. Stick to the basic tried-and-true sports drinks such as Gatorade or PowerAde, because they provide a good balance of carbohydrate, sodium, and potassium to replace losses. Follow the same drinking schedule as for water, but also listen to your body. Drink when you are thirsty and monitor how much you urinate and the color of your urine. If you are urinating frequently throughout the day and your urine is a light-straw color, you are probably drinking enough fluids.

## **Notes:**

## Frequently Asked Questions

### **My teammates told me that all runners should take iron supplements. Is that true?**

Iron supplements should only be used if you have iron depletion or iron deficiency. The only way to know your iron status is to have a blood test to check hemoglobin, hematocrit, and ferritin (the storage form of iron). Runners do have a higher prevalence of iron depletion or deficiency, so it is a good strategy to include iron-rich foods in your diet along with adding foods to enhance iron absorption. Iron-rich foods include beef, dark-meat chicken or turkey, pork, tuna, clams, beans (for example, black beans, kidney beans, or navy beans), raisins, dates, spinach, and grains with added iron (check the Nutrition Facts panel to look for iron content). Adding vitamin C-rich foods can help you absorb the iron in grains and vegetables. Drink a glass of orange juice with your breakfast cereal, add tomato salsa to a bean burrito, or eat a kiwifruit along with an energy bar to improve iron absorption in foods.

### **Will caffeine help me run longer?**

Caffeine is an ergogenic aid, meaning that it can help you feel less fatigued or tired. Caffeine seems to work on the central nervous system (brain) to block a compound that causes fatigue. The amount of caffeine needed is small, 0.9 to 1.35 milligrams per pound of body weight (2 to 3 milligrams per kilogram of body weight), or about 104 to 155 milligrams of caffeine for a 115-pound runner. That is the amount found in about ½ cup of premium coffee. Some studies have found that there are a variety of ways to maximize the effectiveness of caffeine on endurance events. It can be used before the run, during the run, or in the later stages when fatigue starts to set in. If you want to experiment with caffeine, stick to a moderate dose and try it during training. The response to caffeine is highly variable, and more isn't better. Too much caffeine can make you nervous and anxious, and that is not good for sports performance.

### **What are some good resources for nutrition and distance running?**

The best resource is a registered dietitian nutritionist, especially one who specializes in sports nutrition.

To find a qualified sports dietitian, connect to the website of Sports, Cardiovascular, and Wellness Nutrition (SCAN) ([www.scandpg.org](http://www.scandpg.org)) and use the “Find a SCAN RD” search box. SCAN also has free sports nutrition fact sheets on a wide range of topics at [www.scandpg.org/sports-nutrition/sports-nutrition-fact-sheets](http://www.scandpg.org/sports-nutrition/sports-nutrition-fact-sheets).

For online resources, check out the United States Olympic Committee's sports nutrition resources at [www.teamusa.org/About-the-USOC/Athlete-Development/Sport-Performance/Nutrition](http://www.teamusa.org/About-the-USOC/Athlete-Development/Sport-Performance/Nutrition). You will find many resources there, including videos, recipes, and eating guidelines for athletes.