

Fueling Trojan Athletes



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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.

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 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 15 grams of carbohydrate:

- 1 slice bread
- 6-inch tortilla
- ½ cup corn
- ½ cup mashed potatoes
- ½ medium baked or sweet potato
- 1/3 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

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.

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

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.

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 1/2 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.



Food Basics

The Basics

- Eat breakfast every day.
- Drink plenty of water.
- Eat five servings of fruits & veggies.
- Eat lean protein with meals and snacks.
- Choose foods that help you feel your best.
- Tune into your body's cues for when you're thirsty, hungry, and full. Respect your body by meeting its needs.
- Plan ahead for meals and snacks.

Parent's or Caregiver's Role

- Choose and purchase the food.
- Provide regular meals with snacks.
- Eat together as often as possible.
- Encourage cooking and preparing food together.

Athlete's Role

- Choose if they are going to eat.
- Determine how much to eat.
- Stop eating when they are full.
- Decide how fast/slow they will eat.

Hydration

Staying hydrated is a key ingredient to keeping your body healthy and safe during intense exercise. Dehydration can increase your risk of injury or cause serious heat illnesses.

WATER BASICS

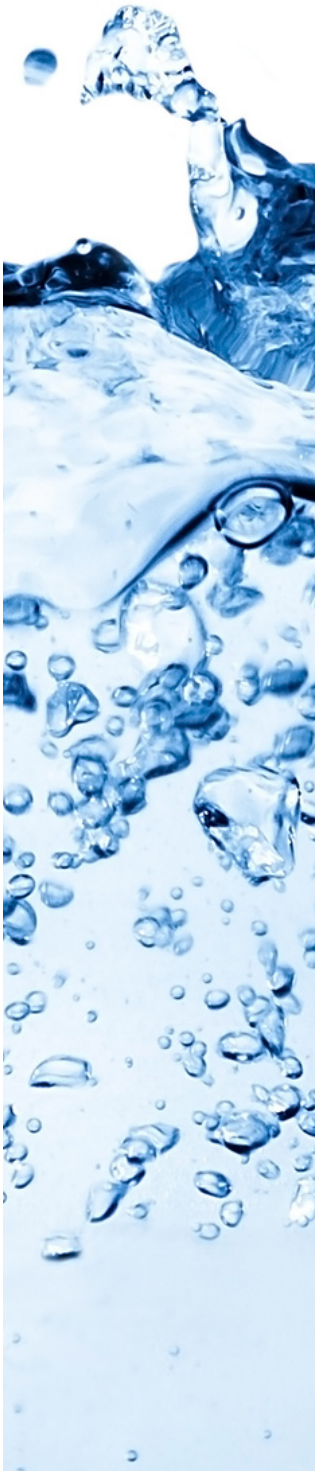
- ✓ Check your urine and aim for clear to light yellow.
- ✓ If you're thirsty, you're already dehydrated.
- ✓ Aim for 80-120 ounces of fluid each day, or 1/2 to 1 ounce per pound of body weight
- ✓ Drink 8-12 ounces of water every 20 minutes during activity
- ✓ Don't over do it.

WHEN TO CONSIDER A SPORTS DRINK

- ✓ Exercise is longer than an hour
- ✓ Intense workouts
- ✓ Practicing or playing in high humidity & heat
- ✓ Excessive sweating

WARNING SIGNS OF DEHYDRATION

- Intense thirst
- Exhaustion
- Increased temperature
- Fast heart rate
- Fast breathing
- Confusion
- Fainting or feeling dizzy
- Cramping
- Headaches
- Dark urine



Calories: How much should an athlete eat?

Active teenagers need lots of fuel to get them through the day. On average ...

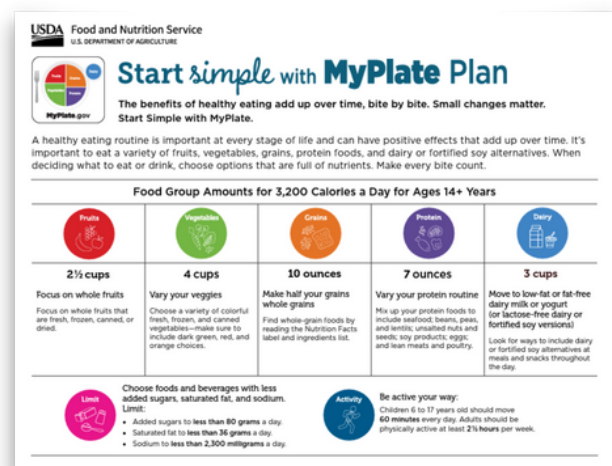
- Boys need 3,000 to 4,000 calories a day.
- Girls need 2,400 to 3,000 calories a day.

Teen athletes benefit from eating regularly (every few hours) and incorporating a mix of carbohydrates, fats, and protein every time they eat.

MyPlate Plans

For a more personalized plan, we recommend using the tools on MyPlate.gov. With their planning tool, you'll enter your age, sex, weight, height, and level of physical activity. A food plan will then be calculated that you can view online or download and print. It's important to remember that every body is different and you may need more calories on very active days, and less on other days. The MyPlate Plan is a great starting point and should be used along with your own body's needs and hunger cues.

- Start at myplate.gov/myplate-plan.
- Click on **Start**.
- Enter your age, sex, weight, height, and level of physical activity.
- Click **Calculate food plan**.
- Click on the calorie amount calculated to view and then download a MyPlate plan for that amount of daily calories.



How Teen Athletes Can Build Muscles with Protein

Article from eatright.org — Academy of Nutrition and Dietetics

Eating protein doesn't equal big muscles. Instead, muscle growth is a complex process that relies on adequate consumption of protein and calories, hormones the body produces, including human growth hormone and testosterone, and a healthy dose of physical activity. Here are a few facts and tips to keep in mind before you amp up your protein in search of a new physique.

Work Builds Muscle

Although eating protein doesn't build muscle on its own, the presence of protein in an athlete's eating pattern is important. Believe it or not, when you exercise, such as lifting weights or running, some of your muscle cells break down. Protein from food helps repair this damage from exercising and builds up more muscle, making them stronger.

Strike a Balance

While protein is important for building new muscles, **eating the right amount of protein** [and at the right time] **is key**. Consuming more protein than your body needs may translate to excess calories that must be stored, usually in the form of fat. Too little protein consumption means your body has to supply it itself, which can result in muscle breakdown and loss. When you eat a balanced diet that includes enough calories and carbohydrates, your body won't use protein as a calorie source — it will spare it to build muscles and repair them when needed.

How Much Protein Is Enough?

Young athletes need slightly more protein than their peers who aren't athletes. Protein needs are based on age, sex, body weight and stage of development, with teens needing between 10 to 30% of their daily calories from protein. Although an individual's exact needs will vary, the Recommended Dietary Allowance (RDA) provides a good reference for how much of a certain nutrient a healthy individual needs in a day. The RDA for protein is 46 grams for teenage girls and 52 grams for teenage boys per day.

Most athletes are able to meet these protein requirements and then some. In fact, studies show that young athletes consume two to three times the RDA for protein! Although athletes may have higher protein needs than their peers, contrary to popular belief, consuming large amounts of protein does not build additional muscle.

One strategy that may provide an advantage, though, focuses on timing. Studies now show that it is not just the total protein intake for the day that counts for athletes. The body can best build and maintain muscles when protein is divided relatively evenly throughout the day. To do this, include a source of protein at each meal and snack. [Our Athletic Trainer recommends about 20g of protein within 30 minutes post-exercise.]

The Best Protein Sources

Many foods contain protein, but high-quality protein comes from beef, poultry, fish, eggs, milk and dairy products, soy and soy products. Including a variety of plant-based sources of protein, such as beans, nuts, and seeds throughout the day can also help to meet protein requirements.

Beware of Protein Supplements

Some athletes wonder about using a protein supplement such as protein powder or a high-protein drink. Overall, this isn't necessary and even might be dangerous. Using protein supplements may lead to excessive protein intake, taxing the kidneys and promoting dehydration. Plus, the risk for contamination with steroids, hormones or other unwanted ingredients is real, as the safety of dietary supplements is largely left to manufacturers.

The good news? You can meet your protein needs with food alone! Just be sure to eat a serving of protein, like the ones above, at each meal and snack.

Foods that Fuel

Lean Meats

- Boneless chicken breast*
- Fish (cod, salmon, tuna)*
- Lean beef (steak, burger)*
- Turkey*
- Pork*
- Eggs or egg whites*

Dairy

- Low-fat milk*
- Low-fat yogurt*
- Greek yogurt*
- Cheese*
- Low-fat cottage cheese*

Grains

- Whole wheat or whole grain bread items like bagels, tortillas, pitas, English muffins
- Oatmeal*
- Whole grain pasta
- Whole wheat crackers
- Brown rice
- Quinoa*
- Whole wheat or whole grain cereals

Beans, Nuts & Seeds

- Edamame*
- Black beans*
- Chickpeas*
- Lentils*
- Nuts and seeds*
- Tofu*
- Nut butters*



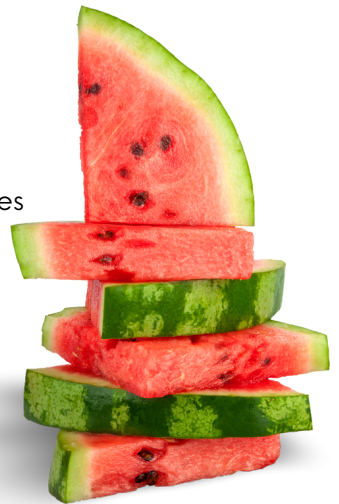
How much protein do I need to eat?

For very active teens who are looking to build muscle mass, aim for 1/2 to 1 gram of protein per pound of body weight.

*Foods that are good sources of protein.

Fruits & Vegetables

- | | | | |
|-------------------|---------------|--------------------------|------------------|
| • Apples | • Carrots | • Lettuce, spinach, kale | • Sweet potatoes |
| • Apricots | • Cauliflower | • Oranges | • Tomatoes |
| • Avocados | • Celery | • Peaches | • Watermelon |
| • Bananas | • Cherries | • Pears | • Zucchini |
| • Berries | • Corn | • Peppers | |
| • Broccoli | • Cucumbers | • Pineapple | |
| • Brussel sprouts | • Grapes | • Plums | |
| • Cantaloupe | • Green beans | • Potatoes | |



Smoothies: A Great On-the-Go Option

Start with a cup of liquid like water or milk...

- Add a cup of frozen fruit you like, such as:
 - Blueberries, strawberries, or blackberries
 - Banana
 - Mango
 - Peaches
- Consider adding healthy fats like avocado, peanut butter, or almond butter.
- Consider adding in a vegetable like spinach, kale, tomato, or carrot.
- Blend together, adding ice or liquid as needed.

Ideas for Items to Have on Hand

- Chicken salad
- Egg salad
- Pre-made sandwiches
- Beef or turkey sticks
- Tuna packets
- Premade salads
- Peanut butter

Snack Ideas for Busy Days (Perfect for a backpack!)

- 100% juice boxes
- Trail mix
- Peanut butter crackers
- Granola bars
- Dried fruit
- Applesauce pouches
- Almonds
- Peanuts
- Cashews



Healthy Snacks to Refuel

The best sports recovery snack choices for youth athletes are the foods that they are familiar with and that they tolerate. Serving a combination of carbohydrate-rich foods with protein will help prevent muscle soreness and prepare your child for their next practice or competition. A meal or snack will also help youth athletes to refuel and rehydrate their body after intense activity. Healthy snack combinations include the following:

$\frac{3}{4}$ cup low-fat yogurt +
 $\frac{1}{2}$ cup granola +
 $\frac{3}{4}$ cup frozen peaches

Trail mix made with:
1 ounce beef jerky +
1 ounce dried pineapple +
 $\frac{1}{2}$ cup ready-to-eat cereal

1 cup low-fat chocolate milk +
8 graham crackers

1 apple +
2 tablespoons of
peanut butter

12 whole wheat tortilla chips +
 $\frac{1}{2}$ cup black bean and corn salsa

1 cup ready-to-eat cereal +
1 cup low-fat milk

1 ounce pretzels +
1 ounce raisins

6 wheat crackers +
1 ounce summer sausage +
1 ounce low-fat cheese

1 fruit and nut granola bar +
3 ounce applesauce pouch

Fruit smoothie made with
 $\frac{3}{4}$ cup low-fat yogurt +
1 small banana
 $\frac{1}{2}$ cup low-fat milk

12 wheat crackers +
 $\frac{1}{4}$ cup avocado +
1 low-fat mozzarella string cheese

1 mini bagel +
2 tablespoons cream cheese +
1 cup low-fat milk

$\frac{1}{2}$ cup cooked oatmeal +
1 cup blueberries +
2 tablespoons nuts

1 whole wheat English muffin +
2 tablespoons peanut butter +
1 tablespoon fruit preserves

2 tablespoons hummus +
1 cup raw veggies such as carrots,
broccoli, cauliflower

1 medium orange +
1 hard-boiled egg

6 wheat crackers +
 $\frac{1}{3}$ cup tuna salad

1 eight-inch tortilla +
2 ounces sliced turkey

Information from the Academy of Nutrition and Dietetics Nutrition Care Manual



Building Good Habits

In addition to good nutrition habits, athletes also need to develop good habits for recovery in between practices and competition.



Sleep

- Aim for 8 hours of sleep every night to help your body recover from practices and competition.
- Create a healthy routine each night to help yourself fall asleep.
 - Turn off electronics like phones, laptops, and TVs a half hour to hour before bed.
 - Use the time before bed for self-care like stretching, journaling, or reading.
 - Stick to a regular bedtime and wake-up time.
 - Avoid or cut back on caffeine.

Cool-Downs, Massage, & Stretching

- Don't skip the cool down at the end of a workout.
- Use a foam roller or tennis ball to massage muscles.
- Stretching — both static and dynamic — can help you reduce soreness and may help prevent injuries.
- Keep ice packs (or bags of frozen peas) on hand. When needed, apply the ice for 20 minutes at a time.
 - You can also make an ice pack by mixing one cup of rubbing alcohol with three cups of water and freezing in a plastic freezer bag.

MEAL PLANNING TIPS

- Start by checking the refrigerator, freezer, and pantry to see what you already have on hand.
- Look at the calendar and determine when and where you'll eat your meals, and make note of any special events or considerations that you'll need to plan around.
- Check out the weekly grocery ads to see what's on sale and in season.
- Review your meals and see if there is something from each of the food groups in most of your meals. This is the simplest way to make sure your meals are healthy.
- If you have extra room in your grocery budget, try to stock up on the pantry items you use regularly.

What do I already have at home?

	Monday	Tuesday	Wednesday	Thursday	Friday
Breakfast					
Snack					
Lunch					
Snack					
Dinner					
Did I include...	• Grains • Veggies • Fruits • Dairy • Protein	• Grains • Veggies • Fruits • Dairy • Protein	• Grains • Veggies • Fruits • Dairy • Protein	• Grains • Veggies • Fruits • Dairy • Protein	• Grains • Veggies • Fruits • Dairy • Protein

GROCERY LIST

FRUITS & VEGETABLES

MEAT

FISH & SEAFOOD

DAIRY

BREADS

CANNED GOODS

FROZEN GOODS

RICE & PASTA

CONDIMENTS

SNACKS

BEVERAGES

OTHER