

Nutrition & Hydration for Endurance Athletes

The most important point to remember about eating for performance is that all of us are different. Each of us must experiment for ourselves with what works best. Still, there are guidelines that seem to work for most athletes. Try different foods and snacks and follow the guidelines below to perform at your best.

General Nutrition - The Basics

The athlete diet is based on years of research on how to provide the most energy for performance. Although all athletes have common needs when it comes to nutrition the diet for the endurance athlete is different, as the demands of training and racing typically require efforts in excess of 2 hours. Many diets are getting coverage in magazines and in the news, but carbohydrates are still the best fuel for athletic performance. The general recommendation for athletes is as follows:

Carbohydrates:	55-65%
Fat:	25-30%
Protein:	15-20%

Most sport nutritionists agree, however, that endurance athlete diets can contain upwards of 65-70% carbohydrates for ultra events and for those competing at very high levels.

Carbohydrates: the goal is to take in mostly complex carbohydrates such as whole grain (rye, wheat, oat, corn, barley, etc) cereals and breads, potatoes, rice, pasta, legumes, beans and fresh fruits and vegetables etc. Keep the cookies, cakes, candy and ice cream intake low, especially around event time. These simple sugars can wreak havoc on your energy levels!

Protein: ideally we want lean proteins such as turkey, fish, chicken, seafood, pork, low-fat dairy products, eggs, nut butters, soy products lean beef and beans and rice, etc.

Fats: the issue around fat is saturated vs. unsaturated. Basically, aim to limit levels of saturated fats (found in animal products and tropical oils) and trans fatty acids (the hydrogenated oil found in commercially prepared foods and some hard margarines). Aim for mostly unsaturated sources: most vegetable oils, nuts, avocados, some cheeses, etc. Limit saturated fats - they are often solid at room temperature – butter, cheese, lard (animal fat), etc. but beware of cream, ice cream and the tropical oils that are frequently used on popcorn at movie theaters.

Considerations:

- During “off” season slightly lower levels of carbohydrate is probably a good idea and a bit more protein
- Generally you want each meal to contain some of each of fat, protein and carbohydrate.
- Water provides no caloric nutritional benefit: Calories come from only three sources – fat, protein, carbohydrate.
- Hydration is critical for producing energy and avoiding heat illness. 64 ounces minimum per day + 5-10 ounces every 15 minutes during sustained aerobic exercise. It is not uncommon for athletes to consume 128 ounces (1 gallon) per day during summer training time (see “Hydration for Athletes”)

Carbo-loading: a high carbohydrate diet is important for endurance athletes but especially in the few days before an event. During the 3 days before your event aim to get 65-70% of your calories from carbohydrates. This will help to maximize your energy stores during your event.

Snacking: One of the keys to performing well is keeping your energy levels consistent. Eating low-fat healthy snacks during the day can help ensure you have the energy for racing and training.

- ❖ Snack only when you are hungry. Not when you are bored!

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- ❖ A snack is not a meal. Keep your snack small!
- ❖ Keep good snacks at home, in the car, in your locker or wherever you spend time. You will always have good choices available and will be less tempted to head for the candy machine.
- ❖ Keep a log of when you get hungry during the day. Eat a snack before hunger comes on to avoid a drop in energy.
- ❖ Drink water before you snack to ensure you are hydrated. Hunger pangs can be a sign of dehydration.
- ❖ Fruit, veggies, low-fat whole grain crackers, pretzels, yogurt, cheese made with skim milk, and energy bars are good choices. Energy bars are a good source of carbohydrates but can be very filling, so try part of a bar to start.

Before Events

Try not to eat within the 2-3 hours before an event to allow food to empty from the stomach. Pre-event eating is unique for each person but there are guidelines that work well for most athletes. Keep pre-event meals light. High carbohydrate sources such as breads, oatmeal, whole grain cereals and fruit seem to work well for most people, but experiment for yourself to find what works best for you.

During Events - Rule #1: *try it in training first – NOTHING NEW ON RACE DAY!*

Taking in calories during an event is crucial to thwart “hitting the wall”. If your event is between 45 minutes and 2 hours you will do well by drinking fluid replacement drinks. For events lasting longer than 2 hours consider taking in solid foods such as energy bars and/or carbohydrate gels. Generally, it is not critical to take in calories during an event that lasts less than 60 minutes.

General Recommendations for events lasting longer than 3 hours:

- ❖ **Calorie intake:** 200-600 kcals per hour
- ❖ **Fluid intake:** 30-50 ounces per hour
- ❖ **Sodium intake:** general recommendation ~ 1000 mg per hour for a long hot race (from Doug Hiller, M.D. from experience with the Hawaii Ironman) – must experiment to find correct level for you – know how much sodium you are taking in from all drinks, gels and solid food sources. Sweat contains between 2.25 - 3.4 grams (2250-3400 mg) of salt per liter, and the rate of perspiration in a long, hot race can easily average 1 liter per hour.

What to take in to meet recommendations

- ❖ **Fluid replacement drinks** help stave off hunger while providing energy/calories and fluid to keep you going (see “Hydration for Athletes”).
- ❖ **Gu’s and Gels** are all (or very nearly all) carbohydrate and are meant to give you energy fast.
 - Drink 8-10 ounces of water per 25 grams of carbohydrate.
 - Remember your hydration plan when drinking water with gels – how much, how often.
 - Experiment with the quantity and frequency of eating gel packs to avoid nausea or the old gastric distress!
 - Many brands now offer increased electrolyte versions – try them out as part of your electrolyte replacement strategy.
- ❖ **Energy Bars** come in a variety of sizes, flavors and combinations of nutrients. And they are NOT created equal!
 - At least 60% of calories should come from carbohydrates.
 - Glucose and Maltose (Maltodextrin) are preferred carbohydrate sources (glucose & fructose too).

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- Avoid fructose as the main carbohydrate source.
- Experiment with the quantity and frequency of eating energy bars to avoid nausea or the old gastric distress!
- ❖ Electrolyte supplements – many manufactures offer “salt” or electrolyte tablets designed to help limit total electrolyte loss during an event
 - Make sure you know the specific amount of sodium (vs. sodium chloride or other sources) in the brand you use.
 - **Consider the amount of sodium you are taking in from all other sources when deciding how much of an electrolyte supplement to take each hour.**
 - Modify your intake based on your intensity of exercise and weather conditions – hot, more intense exercise = higher sweat rates = higher sodium loss

After Events

What you eat in the few hours after an endurance event is very important to the replenishment and recovery of your muscles. Research has shown that muscle recovery is improved if carbohydrates are consumed in the few hours immediately after an event or long training. Fluid replacement drinks and energy bars are excellent choices post-event.

Because endurance events also break down our muscles, it is also important to eat high quality protein in the hours after a long race or training session as well. Again many energy bars offer quality proteins and are a convenient option. However, a plate of pasta with chicken, fish or lean beef is a great choice too!

- Post race or intense training sessions lasting longer than 1 hour - ingesting 50-100 grams of carbs (Gatorade type drinks, gels, energy bars) within 30 minutes helps speed muscle recovery.
- Post race or intense training sessions lasting longer than 1 hour - ingesting protein (see above) at your first post-race meal (within 2-3 hours) helps speed muscle repair.

Dehydration Basics

- Evaporation of sweat is the most important mechanism for losing heat.
- Sweating leads to dehydration, which impairs our body's ability to function properly.
- Dehydration reduces performance during prolonged training and competition and intensifies in hot environments.
- Dehydration is a common problem. Dehydration by as little as 2% of body weight can impair performance.
- Endurance athletes can lose as much as 2 quarts of water per hour while running.
- Warning Signs of Dehydration ☹️:
 - Fatigue
 - Loss of appetite
 - Nausea
 - Poor concentration
 - Flushed skin
 - Light-headedness
 - Dark yellow urine
 - Muscle cramps

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Hydration Recommendations

1. Active individuals should drink 64-100 ounces of fluid per day (8-12 cups).
2. Drink adequate fluids during the 24 hours before an event.
3. Drink 16-20 ounces of fluid 2 hours **before the event**.
4. Ease drinking fluid in the last 2 hours **before the event**.
5. Drink 8-16 ounces of fluid 15-20 minutes **before the event**.
6. For events lasting over 1 hour (running, cycling, etc), drink 7-12 ounces of fluid every 15-20 min. (28-48 oz. Per Hour) **during event**.
7. Drink 20-24 ounces of fluid for each 1-pound loss of body weight **after the event**.
8. Drink 16 ounces of additional fluid for each 1-pound loss of body weight **during the event**.
9. Avoid caffeinated and/or carbonated beverages and alcohol while rehydrating.

☺ **Sign of Hydration**: regular, colorless or near colorless urination ☺

Fluid Replacement Drink Guidelines

Fluid replacement drinks are liquids that contain carbohydrates and electrolytes. Replacement drinks are ideal for events lasting 45 minutes or longer or to maintain energy during non-continuous competition (i.e. swimming meets, baseball, golf, football etc.) Examples are: Gatorade, PowerBar, Hydrafuel, Exceed, Infinite, etc. What's and Why's of fluid replacement drinks:

- Energy & Fluid Replacement
- 6-8% carbohydrate concentration (14-17gms/8oz) to allow faster absorption
- Glucose and Maltose (Maltodextrin) are preferred carbohydrate sources
- Avoid fructose as main carbohydrate
- Multiple sugars enhance absorption (e.g. glucose & fructose)
- Added Electrolytes: sodium and potassium
- Taste good and be slightly chilled
- Convenient to use