



PowerBar Playbook Series | U.S. Version



SPORTS NUTRITION FOR ROAD CYCLING

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Road cyclists run the gamut from recreational cyclists who live for weekend endurance rides, to the pros who compete in races all over the world. If you're a weekend warrior, your goal may be to train and make it through a century ride. If you're in the professional ranks, 100+ mile stage races can be daily fare, and hours into a ride you've got to be able to dig deep to drive the peloton's pace, catch the breakaway group, and get your team's best rider in position for the sprint to the finish.

For both types of riders, road cycling can be a punishing sport that will drain you of fuel and fluids. If you enter a ride or race inadequately hydrated and fueled, or if you don't keep up with your fluid and fuel needs while on the bike, dehydration takes over, your quads feel dead, and it's all you can do to hang on until the finish.

But if you've got a solid hydration and fueling strategy that you've practiced during training and implemented before and during this ride, you can PR on that century ride. And if you're a pro, you will push the peloton's pace, reel in the breakaway riders, and get your best rider in position to make that frenzied sprint to the line.

The bottom line is that when attention to nutrition and hydration is an integral component of your training and racing or riding strategy, you give yourself the chance to be your very best on the bike no matter what the day has in store.



THE PHYSICAL CHALLENGE

As a road cyclist, at a minimum you need strength and endurance to finish strong on long rides. If you ride among the elite, you also need anaerobic capacity for breakaways, steep mountain grades, and all-out sprints to the finish. You might be involved in team and individual event stage races on a single day or over several days. Time trials and criteriums are probably also a part of your repertoire. Race distances can be from as short as a few miles or kilometers for some criteriums, to individual stages covering 150 miles (250 km) or more. Elite cyclists might train once or more daily and rack up weekly distances of anywhere from 250 miles to more than 600 miles (400–1,000 km). Serious recreational riders commonly log 185 miles (300 km) in a week. Weight training might be a regular part of the workout mix as well for both pros and recreational riders. In-season, elite cyclists can race almost every day, while recreational cyclists will often ride or race once or twice a week.

With these types of physical demands, sweat losses can be enormous and muscle fuel stores can be seriously depleted on a daily basis. Recovery between workouts, training rides, and races is crucial, and rehydrating and refueling during long hours on the bike is essential to delaying fatigue and extending endurance.

The fact is that cycling long distances at a strenuous pace puts a huge strain on your body. Your leg muscles rapidly burn through fuel stores while generating loads of internal body heat. Add heat or humidity to the mix, and the physical and metabolic toll rises even higher. To achieve your best on the bike under these challenging circumstances, you have to stay hydrated and fueled for as long as you can. Inadequate attention to either of these factors will undermine your performance. Fortunately, you can extend your endurance and keep fatigue at bay by having a well-conceived and practiced performance sports nutrition plan.

KEY PRINCIPLES OF SPORTS NUTRITION

The three most important principles of a sports nutrition strategy for road cycling are to hydrate, to provide fuel for your muscles, and to promote optimal recovery after training or competing. Applying these principles correctly can help you maximize the gains from all your training and help ensure that you perform at your best on the bike during hard rides or competitions.

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Ironman PERFORM™
sports drink

HYDRATION

Dehydration is the single largest contributor to fatigue when training or racing. Contracting leg muscles produce the force necessary to pedal and propel the bike forward. Those muscles also produce loads of internal heat in the process. This heat must be dissipated quickly to avoid overheating. Sweating is a crucial mechanism for thermoregulation, or ridding your body of heat, but it causes you to lose the very same fluids and the electrolyte sodium you need to remain hydrated. Dehydration impacts your cycling performance when you lose just 2% of your body weight due to fluid loss.

For a 150-lb (68-kg) cyclist, a 2% weight loss equates to just 3 lbs (about 1.4 kg). Road cycling, especially in the heat or humidity, can easily result in fluid losses exceeding this 2% threshold. And when you're dehydrated, your heart has to work harder and your internal body temperature is elevated. This makes every pedal rotation that much more difficult. A steep incline feels even steeper and a long flat seems like it will never end. Dehydration can cause you to have to cut short your training or could make you end your race sooner than you had planned. Dehydration also poses serious adverse health consequences. To avoid dehydration, you need to replace the fluids and sodium you lose from sweating. You might think that thirst will drive you to consume enough fluids to meet your hydration needs, but in fact, thirst during exercise doesn't kick in until well after you're dehydrated and already suffering the consequences. Fortunately, dehydration can be avoided by adhering to a disciplined hydration plan before, during, and after training or racing.

FUELING

Road cyclists do most of their training on the bike. Workouts vary, but the mileage log is likely to be quite high. Weight training might also be part of the equation. Your primary muscle fuels when training and racing are a combination of fat and carbohydrates. Cyclists are generally lean, but even the leanest of the bunch have plenty of fat reserves tucked away. Carbohydrate fuel stores are a different matter entirely. At best, you probably have only about 2,000 calories of carbohydrate fuel on reserve. These carbs are present in your body in two forms: Glucose circulates in your bloodstream, and bundles of glucose called glycogen are stored in your liver and muscles. A single long-stage race or training ride can literally wipe out your carbohydrate fuel reserves. And if you don't fully deplete your stores, workouts or competitions on successive days can finish the job. If you're training or competing regularly, it's critical to promptly replenish glycogen stores after each exercise session. When these fuel stores run dry during exercise, your body turns to liver glycogen reserves to maintain your blood glucose level. But once liver glycogen stores are tapped, your blood sugar level drops, fatigue sets in, and you run out of fuel. You're forced to drastically slow your pace or even stop. So it's crucial that you start your training and racing with your carbohydrate fuel reserves fully replenished. And to extend endurance and delay the onset of fatigue, it's important to refuel with carbs during long rides.



PowerBar® Energy Blasts
gel filled chews



Ironman RESTORE™
sports drink mix

RECOVERY

Training and racing not only deplete your glycogen reserves, they cause damage to muscle fibers, which require repair. If you are weight training, your muscle tissue is being stimulated to increase as an adaptation to the increased workload. Finally, you also lose fluids and the key electrolyte sodium due to sweating during exercise. Recovery is the process of reloading depleted carbohydrate fuel stores, repairing and building new muscle tissue, and rehydrating after workouts or competitions. It's during the recovery process that you achieve the gains from your training and get ready for your next workout or race. Your body is ready to begin recovery as soon as you finish working out or racing, but the process doesn't begin in earnest until you provide the key nutritional components.

PRACTICAL SPORTS NUTRITION STRATEGIES FOR ROAD CYCLING

Fortunately, there are easy-to-implement sports nutrition strategies that can help you prepare for and remain strong throughout training and races, and also help ensure that you fully recover afterwards so you're ready for your next training session or competition.



I. BE WEIGHT SMART

Many elite cyclists are lean, muscular, and vigilant about body weight and calorie intake. A low body-fat level allows more power to be generated for every lb of body weight you're carrying. This is especially critical on hill climbs but has much less of an effect when riding on flats or when time-trialing or sprinting. Heavy training usually takes care of body fat levels. But when coming back after a layoff, there may be a need to trim excess body fat gained. Do this by trimming excess calories from fat, alcohol, and sweets. Maintain your intake of nutrient-loaded carbohydrate sources such as enriched or whole grain breads, cereals, fruits, vegetables, and low-fat dairy products, in order to get the carbohydrate fuel you need for daily training. You can avoid the need to trim body fat in the early season by cutting back on calories during the off-season. Heavy caloric loads are for heavy training. If you take a break or cut back on training and racing, cut back on calories as well.

Frequent meals and snacks, and eating while on the bike, are often required to get the necessary amounts of calories and carbohydrates.

Desire for lower body fat might lead cyclists to restrict calorie intake, but the time for this is not during periods of high-intensity, long-duration training. Make weight loss a goal for the off-season or early season, before training gets intense. When you're working long and hard, you need all your calories in order to stay healthy and to maximize the gains from your training. Striving to lose weight during periods of intense training can result in loss of muscle mass, slower recovery, and an increased chance of illness and injury. In addition, female cyclists who tend to be more prone to inadequate calorie intake can suffer hormonal imbalances, leading to menstrual dysfunction and serious loss of bone mass and strength.

If you are an elite athlete in the throes of heavy training or daily stage races, getting enough calories and carbohydrates on a daily basis might be a formidable challenge. Frequent meals and snacks, and eating while on the bike, are often necessary to get the necessary amounts of calories and carbohydrates. Finally, if you're a recreational cyclist, be sure to balance your intake of gels, bars, and sports drinks with your carbohydrate and calorie needs so that you achieve and maintain a desirable weight.



PowerBar® Fruit Smoothie Energy bar



2. START YOUR RIDES FULLY HYDRATED

If you go into your training sessions fully hydrated, you'll be able to train harder and realize better gains. The same goes for races themselves: You'll be better able to sustain your race pace and achieve your performance goals.

Make up for any fluid deficits by consuming 14–20 fl oz (400–600 ml) of water or sports drink 2–3 hours before your race or workout. Keep hydrating as needed prior to a training session or as you're warming up before a race: Drink at least another 8 fl oz (240 ml), or about 8 gulps, especially if conditions are hot or humid.

You can monitor your hydration status before exercise by checking the color of your urine. A light-yellow color is consistent with adequate hydration. If your urine is darker, more like the color of apple juice, that's typically a sign that more fluids are needed before you start your workout.





PowerBar® Performance Energy bar

3. START YOUR RIDES FULLY FUELED

As a road cyclist, your glycogen stores are usually being depleted with each training ride or race. This means that you must fully replenish your carbohydrate fuel stores on a daily basis. If you don't, you'll rapidly run out of carbohydrate fuel, and workouts and performances will suffer noticeably.

To top off muscle glycogen fuel stores before training or racing, consume a pre-exercise meal somewhere between 2–4 hours before getting on the bike. The goal is to start exercise fully fueled and hydrated, but also feeling comfortable. Choose familiar carbohydrate-based foods and beverages and avoid slow-to-digest fatty and high-fiber foods prior to riding. Carbohydrate-based foods include pasta, rice, bread, cereal, fruit, and sweetened dairy products such as flavored yogurts and milks. Experiment during training in order to find the right foods and timing that work best for you.



PowerBar® Energy Bites

If you get hungry before a race, make sure you have carbohydrate-based snacks on hand, such as a PowerBar® Performance Energy bar, PowerBar® Energy Gels, PowerBar® Energy Blasts gel filled chews, or PowerBar® Energy Bites, and consume your snack along with fluids. The ideal time for a snack is about an hour before riding; aim for about 40–60 grams of carbs.

If you get prerace jitters and typically don't feel like eating, or you have a tendency to experience gastrointestinal distress when riding, don't skip eating entirely. Instead, try liquid carb sources in place of solids for your prerace meal. A fruit smoothie or a meal replacement drink is a good carbohydrate-based alternative.

Even though the following suggestions might vary in nutritional content, the general idea is to eat a larger volume of food when you have more time before exercise, and less volume when you have less time. Remember this helpful saying: "The more time the more food, the less time the less food." Practice with the same food options during training so you have your best preride meal in place before all your competitions.

Finally, don't forget to eat before early-morning workouts. If time is running short, try a fruit smoothie, a meal replacement drink, a PowerBar Performance Energy bar, a PowerBar Energy Gel, PowerBar Energy Blasts gel filled chews, or PowerBar Energy Bites combined with water.

IDEAS FOR CARBOHYDRATE-BASED MEALS BEFORE RIDING (2–4 hours before exercise)

Breakfast Options

- Cold or hot cereal with fruit or fruit juice and low-fat or nonfat milk
- French toast or pancakes with maple or fruit syrup
- Toast with jam or honey and low-fat yogurt
- Breakfast burrito (scrambled eggs, salsa, and low-fat cheese in a flour tortilla) and fruit juice
- Bagel or English muffin with jelly and/or peanut butter, banana, and fruit juice

Lunch or Dinner Options

- Pasta or cheese ravioli with low-fat, tomato-based sauce; low-fat/nonfat milk; pudding snack; and canned fruit
- Grilled chicken sandwich with frozen low-fat yogurt
- Turkey sub sandwich with tomato, lettuce, and mustard; baked chips; and fruit juice
- A slice of thick-crust cheese pizza and canned peaches
- Baked or grilled lean beef, chicken, turkey, or fish; steamed rice; dinner roll; cooked green beans; and low-fat milk

IDEAS FOR CARBOHYDRATE-BASED SNACKS BEFORE RIDING (30–60 minutes before exercise)

Fruit smoothie made with mango/banana/berries and low-fat or nonfat milk or yogurt

Dried fruit and pretzels

Fresh fruit or 100% juice

Graham crackers

Low-fat or nonfat yogurt, or fat-free frozen yogurt, gelato, or sorbet

Ironman PERFORM™ sports drink

PowerBar® Performance Energy bar

PowerBar® Fruit Smoothie Energy bar

PowerBar® Energy Gel

PowerBar® Energy Blasts gel filled chews

PowerBar® Energy Bites



PowerBar® Energy Blasts
gel filled chews



4. FUELING DURING A RIDE

Because you miss regular meals during long training rides and stages, you increase the challenge and importance of meeting hydration and fueling needs. During stage races, elite riders often have support vehicles and domestiques to supply food and fluids. But if you compete at a recreational level, you're probably hauling your own food and fluids.

Either way, plan ahead and bring portable foods for refueling on your bike. Keep in mind that both solids and liquids are possible on the bike. Just be sure to chew solid foods thoroughly to reduce your risk of choking.



PowerBar® Energy Gel

IDEAS FOR PORTABLE SNACKS DURING RIDING

Bananas

Dried fruit and nut mix

Small peanut-butter-and-jelly sandwich

Ironman PERFORM™ sports drink

PowerBar® Performance Energy bar

PowerBar® Fruit Smoothie Energy bar

PowerBar® Energy Gel

PowerBar® Energy Blasts gel filled chews

PowerBar® Energy Bites

Glycogen depletion of the quads leads to heavy legs, and low blood sugar leads to fatigue. Avoid both by initiating the refueling and rehydrating process early in a ride or race; don't wait for your glycogen stores to run dry or your blood sugar to drop. You should consume 30–60 grams of carbs per hour for exercise lasting 1–2 hours, or 45–90 grams of carbs per hour for exercise lasting more than 2 hours.

If you are using an energy gel to refuel, make sure to select one that provides sodium along with carbohydrates, such as PowerBar Energy Gel. These gels are designed to be consumed every 20–45 minutes during exercise along with fluids, and they provide the carbohydrates and sodium of a sports drink.

Sports nutrition products such as the PowerBar Performance Energy bar, PowerBar Energy Blasts gel filled chews, and PowerBar Energy Bites can also be used on the bike to increase the hourly intake of carbs during long rides. In cycling, convenience is key, as most foods get crushed in a jersey pocket. So bars, gels, and chews work especially well.



Ironman PERFORM™
sports drink

5. REHYDRATING DURING A RIDE

To stay hydrated on the bike, it is the recommendation of the American College of Sports Medicine that athletes consume fluids at a rate that closely matches their sweat rate. This generally requires something on the order of 13–26 fl oz (400–800 ml) of fluid for every hour of exercise, preferably in smaller amounts taken frequently, such as 3–7 fl oz (100–200 ml) every 15 minutes.

In cycling, convenience is key, as most foods get crushed in a jersey pocket. So bars, gels, and chews work especially well.



However, fluid needs can vary considerably based on factors such as body size, pace, and weather conditions. Therefore, calculate your sweat rate for the various conditions in which you train and race. Determining your sweat rate is really quite simple. For a step-by-step guide to calculating your sweat rate, and to obtain a personalized plan to meet your unique hydration needs, use the PowerBar® Sweat Rate Calculator at www.powerbar.com/src.

Team Timex athlete and
PowerBar® Team Elite™ member

TAMARA KOZULINA



PHOTO BY: LARRY ROSA

Water is usually fine for short rides (less than an hour) in cooler weather. However, for long rides and any time you're riding in the heat and humidity, a sports drink that provides carbohydrates, fluids, and sodium, such as Ironman PERFORM™ sports drink, is the best option. First, a sports drink provides carbohydrates to help sustain your blood glucose level during exercise. Second, athletes typically consume more fluids when their hydration beverage is flavored, as is the case with a sports drink. Third, the sodium and carbs in a sports drink cause the fluid in the beverage to be absorbed more quickly. The sodium also helps maintain your drive to continue drinking fluids when riding, which is crucial to meeting your fluid needs. Finally, the sodium also helps you retain the fluid that you've consumed. In hot weather, fluid needs typically outstrip carbohydrate needs, and you might require additional fluid. In these conditions, a combination of a sports drink and plain water is used for rehydration.

6. PRACTICE YOUR REGIMEN DURING TRAINING

There's no question that starting a training ride or race fueled and hydrated, and rehydrating and refueling during the ride, is critical to a successful sports nutrition strategy. But take the opportunity to experiment with the types and timing of foods and beverages during training. Make small adjustments to your regimen as needed, and trial those as well. The objective is to have a hydration and fueling regimen on race day that you know works for you, given the conditions in which you're riding.



7. ACTIVELY PROMOTE RAPID RECOVERY WHEN YOU NEED IT

As soon as you finish a ride, make recovery your first priority, especially if you're jumping back on the bike within 24 hours. The recovery stage is where you make the gains from your hard work and where you prepare for your next ride. Your body is ready to start the recovery process just as soon as you get off the bike, but you need to provide the nutritional components, including carbohydrates to restore depleted glycogen stores, protein to repair and build muscle tissue, and fluids and sodium to effectively rehydrate.

Carbohydrates

To speed the reloading of your depleted muscle glycogen fuel stores, consume about 0.5 grams of carbohydrates per lb (1.1 grams per kg) of body weight within 30 minutes of finishing a ride. You can repeat this again within 2 hours, or transition to your usual carbohydrate-based snacks and meals. For a 150-lb (68-kg) cyclist, that equates to about 75 grams of carbohydrates immediately after riding and then again 2 hours later. You can also rapidly refuel by consuming smaller

amounts of carbohydrates more frequently if that leaves you feeling more comfortable. Your total carbohydrate intake for the day will depend on your level of training.



PowerBar ProteinPlus™ protein powder drink mix

Intensity Level of Training	Daily Carbs Needed	Example for 150-lb (68-kg) Athlete
Low	2.3–3.2 grams per lb body weight (5–7 grams per kg)	345–480 grams of carbs daily
Moderate to Heavy	3.2–4.5 grams per lb body weight (7–10 grams per kg)	480–675 grams of carbs daily
Extremely Heavy	4.5–5.5 grams per lb body weight (10–12 grams per kg)	675–825 grams of carbs daily

Protein

Muscle tissue repair and building is another important facet of recovery. Muscle tissue is made up of protein, and protein is made up of building blocks known as amino acids. When you consume protein foods, the protein is digested and broken down into its component amino acids. These amino acids are then absorbed and repackaged into the proteins your body needs, including those required to repair and build muscle tissue. Although protein requirements vary between individuals, try to consume a minimum of 15–25 grams of protein within an hour after exercise in order to maximize the muscle rebuilding and repair process.



PowerBar ProteinPlus® protein bar

For your training rides or races, consume 15–25 grams of protein within an hour after you get off the bike.

Fluids and Sodium

Road cycling can lead to heavy fluid and sodium losses due to sweating. Weigh yourself before and after riding in order to gauge your net loss of fluids. Replace this fluid by gradually drinking about 23 fl oz of a sports drink, recovery beverage, or water for every lb (1,500 ml per kg) of weight lost. Consume sodium sources along with your fluids. Rehydration will be more effective when sodium is included with the fluid and food you consume as you recover. If your loss of fluids consistently exceeds 2% of your body weight when riding, try to increase your fluid intake a bit to avoid dehydration.



Ironman RESTORE™
sports drink mix

Ironman RESTORE™ sports drink mix is a fast and convenient option for jump-starting the recovery process. Just pour two scoops into your sports bottle, add 16 fl oz of water, and shake. In seconds, you'll have the carbs, protein, sodium, and fluids to start reloading, repairing, and rehydrating. So as soon as you cross that finish line, drink a thirst-quenching serving of Ironman RESTORE sports drink and get on the road to rapid recovery.

The following recovery options include at least 10 grams of protein and a moderate amount of carbohydrates to promote recovery.

RECOVERY OPTIONS

Food	Protein
2 oz pretzels dipped in 2 tbsp peanut butter	14 grams
Turkey sandwich with 2 oz turkey	20 grams
2 rice cakes with 2 oz low-fat cheese slices	16 grams
2 oz string cheese with 1 apple	14 grams
1 cup low-fat yogurt	11 grams
Low-fat chocolate milk – 10 fl oz (300 ml)	10 grams
PowerBar® Recovery bar	12 grams
PowerBar ProteinPlus® Bites – 1 pouch	20 grams
PowerBar ProteinPlus® protein bar	23 grams
PowerBar ProteinPlus® 30g protein bar	30 grams



PowerBar ProteinPlus®
30g protein bar



PowerBar® Energy Bites

8. KNOW YOUR EXTRA-ENERGY OPTIONS

Carbohydrate Loading

If you're going to be in a race that will require every last gram of muscle glycogen and more, carbohydrate loading might be right for you. Carbohydrate loading is a technique where you taper your training one or more days before a race, while increasing your intake of carbs. Done correctly, the net result is a significant boost in your stores of muscle glycogen. That can translate to a performance benefit in long races. For more on carbohydrate loading and to learn how to load effectively, search [Carbohydrate Loading](#) at www.powerbar.com.

PowerBar® C2MAX Dual Source Energy Blend for Faster Fueling

For typical endurance exercise of a couple of hours or less, the consensus recommendation for refueling with carbs is to consume 30–60 grams per hour of exercise. If your riding challenge exceeds the 2-hour threshold and your pace is fast, you might benefit from a faster delivery of carbohydrate fuel to your working muscles. But just any carbs won't do the trick. Research has shown that consumption of a 2:1 ratio of glucose to fructose during extended endurance exercise delivers more energy to your muscles; for cyclists, a study showed an 8% improvement in time trial performance (the study compared a drink containing glucose alone to one with a 2:1 glucose-to-fructose ratio). The carb combination is important, because it takes advantage of the fact that your digestive tract has two separate transport systems for the absorption of glucose and fructose. If you load up on just one carb source or the other, the transporters for that source fill up and you can't absorb the extra carbs. But by providing both glucose and fructose, you take advantage of the dual transport system and you get the benefit of extra fuel. PowerBar makes it easy to take advantage of this cutting-edge research with PowerBar C2MAX dual source energy blend. PowerBar C2MAX features the research-tested 2:1 ratio of glucose to fructose. The carbohydrates in products that contain PowerBar C2MAX energy blend can be consumed at the rate of up to 45–90 grams per hour when riding. For more information on PowerBar C2MAX, go to www.powerbar.com.

Team Timex athlete and
PowerBar® Team Elite™ athlete
ANDREW HODGES



PHOTO BY: LARRY ROSA



PowerBar® Energy Gel

Caffeine

Coffee is the world's most popular beverage, and its caffeine content is a major reason why. For many, a cup of coffee in the morning helps wake us up, and a second cup in the afternoon helps keep us going — a fact not lost on distance runners. Caffeine has been the subject of extensive research. It can boost performance in many athletes, including distance runners. The exact mechanisms are still being studied, but the benefit seems clear. Caffeine before or during endurance exercise can help reduce the perception of how hard you're working, so you might run faster and/or farther without feeling like you're working harder. However, you don't need tons of the stuff to get an effect, and some athletes are sensitive to caffeine and should avoid it. The more recently recommended amount for performance improvement is 0.45–1.4 mg caffeine per lb body weight (1–3 mg per kg). For a 150-lb (68-kg) athlete, that equates to about 70–210 mg. To learn more about using caffeine effectively, search [Caffeine and Athletic Performance](#) at www.powerbar.com.

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POWERBAR SPORTS NUTRITION FOR ROAD CYCLISTS

Road cycling is a sport for which sports nutrition was created. Athletes need to achieve appropriate levels of muscle and fat mass, while also obtaining enough calories to sustain the grind of a season and to maintain a strong immune system. Daily recovery with a focus on glycogen restoration, muscle tissue repair and building, and rehydration is critical. Be your best when training and competing — by being prepared nutritionally before you start exercise, by knowing what to rehydrate and refuel with when training or racing, and by doing what's needed afterwards to promote a full recovery. PowerBar® sports nutrition products and tools can help you meet your hydration, fueling, and recovery needs.



DAILY NUTRITION TIPS

- Aim for a well-balanced diet with a variety of carbohydrates, lean protein, and healthful fats.
- Carbohydrates should be the focus of your meals.
- Drink up early: Every morning when you wake up, have a large glass of water.
- Keep up your energy levels: Eat 5–6 smaller meals per day.

Sports Nutrition Plan

	CARBS	PROTEIN	FLUID
BEFORE	<ul style="list-style-type: none"> • 2–4 hours before riding, have a carb-based, low-fat, low-fiber meal • 30–60 minutes before riding, have a carb-based snack (aim for 40–60 grams of carbs) 	<ul style="list-style-type: none"> • 2–4 hours before riding, have a moderate-protein meal 	<ul style="list-style-type: none"> • Start hydrating 24 hours prior to riding • Drink 14–20 fl oz of water or sports drink (400–600 ml) 2–3 hours before riding • Drink another 8 fl oz (240 ml) prior to your ride
DURING	<ul style="list-style-type: none"> • 30–60 grams of carbs per hour for rides lasting 1–2 hours OR • 45–90 grams of carbs per hour for rides >2 hours 	<ul style="list-style-type: none"> • Not required • For longer rides, consider adding snacks that contain protein along with carbs for variety 	<ul style="list-style-type: none"> • Drink at least 13–26 fl oz (400–800 ml) per hour • Aim for 3–7 fl oz (100–200 ml) about every 15 minutes (1 gulp ≈ 1 fl oz) • For rides >1 hour and when weather is hot and humid, use a sports drink with 500–800 mg sodium per 32 oz or 1 liter • Calculate your sweat rate: www.powerbar.com/src
AFTER	<ul style="list-style-type: none"> • Within 30 minutes after riding, have 0.5 grams of carbs per lb body weight (1.1 grams per kg) • Repeat within 2 hours of riding, or transition to carb-based meal 	<ul style="list-style-type: none"> • Within 1 hour after riding, have 15–25 grams protein 	<ul style="list-style-type: none"> • Gradually drink 16–24 fl oz per lb body weight lost (or 1,000–1,500 ml per kg body weight lost)
DAILY	<ul style="list-style-type: none"> • Low-intensity training: 2.3–3.2 grams of carbs per lb body weight (5–7 grams per kg) • Moderate- to heavy-intensity training: 3.2–4.5 grams of carbs per lb body weight (7–10 grams per kg) • Extremely heavy-intensity training: 4.5–5.5 grams of carbs per lb body weight (10–12 per kg) 	<ul style="list-style-type: none"> • 0.6–0.8 grams per lb body weight (1.4–1.7 grams per kg) 	<ul style="list-style-type: none"> • Hydrate continuously throughout the day

This food plan is intended to give general macronutrient and fluid guidelines while you are training and racing. It is not designed to be any particular caloric level. For a personalized daily food plan, use PowerBar® PowerCoach® to determine your caloric needs and to obtain a daily sports nutrition plan just for you.

PRODUCT FEATURES AND BENEFITS

POWERBAR® PRODUCTS ARE DESIGNED TO BE USED IN COMBINATION TO MEET YOUR SPORTS NUTRITION NEEDS:
Mix and match to meet the demands of your training and competitions.

		PROTEIN (GRAMS)	CARBS (GRAMS)	KEY FEATURES	SUGGESTED USES
	PowerBar® Performance Energy bar	8–9g/bar	44–46g/ bar	Maximum energy delivery with PowerBar® C2MAX dual source energy blend ¹ ; cramp-crushing™ electrolytes ² ; low in fat	Before and during higher-intensity exercise
	PowerBar® Fruit Smoothie Energy bar	6g/bar	43g/bar	Maximum energy delivery with PowerBar® C2MAX dual source energy blend ¹ ; cramp-crushing™ electrolytes ² ; low in fat	Before and during higher-intensity exercise
	PowerBar® Energy Gel*	0g/ packet	27–28g/ packet	Maximum energy delivery with PowerBar® C2MAX dual source energy blend ¹ ; cramp-crushing™ electrolytes ² ; 0g fat	Before and during higher-intensity exercise
	PowerBar® Energy Blasts gel filled chews*	3g/ packet	45g/ packet	Customized energy delivery with bite-sized gel-filled chews and PowerBar® C2MAX dual source energy blend ¹	Before and during moderate- and high-intensity exercise
	Ironman PERFORM™ sports drink	0g/ 20 fl oz	42g/ 20 fl oz	Maximum energy delivery with PowerBar® C2MAX dual source energy blend ¹ ; cramp-crushing™ electrolytes ²	Before and during exercise
	Ironman PERFORM™ sports drink mix	0g/ 20 fl oz	42g/ 20 fl oz	Maximum energy delivery with PowerBar® C2MAX dual source energy blend ¹ ; cramp-crushing™ electrolytes ²	Before and during exercise
	PowerBar® Energy Bites	5g/ serving	26g/ serving	Customized energy delivery with bite-sized pieces and PowerBar® C2MAX dual source energy blend ¹	Before and during moderate-intensity exercise
	PowerBar Harvest® Energy bar	10g/bar	42–43g/ bar	Long-lasting energy with 5 grams of fiber per bar	Before and during moderate-intensity exercise
	PowerBar® Pure & Simple Energy bar	5g/bar	22–23g/ bar	Calorie-smart, long-lasting energy	Before and during moderate-intensity exercise
	PowerBar® Triple Threat® Energy bar	10–11g/ bar	30–32g/ bar	Long-lasting energy with protein to support muscle growth and repair	Before and during moderate-intensity exercise
	PowerBar® Nut Naturals Energy bar	10g/bar	20–21g/ bar	Long-lasting energy with protein to support muscle growth and repair	Before and during moderate-intensity exercise
	PowerBar® Prio® I10 Plus nutrition bar	5g/bar	15–17g/ bar	Calorie-smart energy	Before and during exercise
	PowerBar® Recovery bar	12g/bar	30g/bar	Carbs to replenish muscle glycogen, protein to support muscle growth and repair, and fat to help restore muscle lipids	After exercise
	Ironman RESTORE™ sports drink mix	7g/ 20 fl oz	50g/ 20 fl oz	Rehydration with carbs to replenish muscle glycogen, and protein to support muscle growth and repair	After exercise
	PowerBar ProteinPlus® Bites	20g/ serving	34g/ serving	Provides customized protein delivery to help build lean muscle along with exercise	Before and/or after exercise
	PowerBar ProteinPlus™ protein powder drink mix	20g/ 8 fl oz	7g/ 8 fl oz	Protein to help build lean muscle	Before and/or after exercise
	PowerBar ProteinPlus® protein bar	23g/bar	35–39g/ bar	Protein to help build lean muscle	Before and/or after exercise
	PowerBar ProteinPlus® 30g protein bar	30g/bar 3.5g leucine	33g/bar	Protein with added leucine to support muscle growth and repair	Before and/or after exercise
	PowerBar® Elite Series HIGH INTENSITY Sustained Release Beta Alanine dietary supplement**			 <ul style="list-style-type: none"> • Helps enhance high-intensity performance*** • NSF Certified for Sport™ • Steady supply of beta-alanine 	<ul style="list-style-type: none"> • Increases muscle carnosine, which buffers muscle acids • Designed for endurance, strength, and team athletes

* Please refer to product labels, as some varieties of PowerBar® Energy Blasts gel filled chews and PowerBar® Energy Gels contain caffeine, which is not recommended for children 18 and under or pregnant women.

** For adult use only.

*** These statements have not been evaluated by the U.S. Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

1. Formulated with C2MAX, a 2:1 glucose to fructose blend found to deliver 20–50% more energy to muscles than glucose alone and improve endurance performance by 8%.

2. Contains per labeled serving (80–200mg) sodium, a key electrolyte lost in sweat that is associated with muscle cramping in some athletes.

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