

FUEL YOUR COMPETITIVE SPIRIT



NUTRITION & HYDRATION
GUIDELINES FOR SERIOUS ATHLETES

ENHANCE YOUR HYDRATION

Adequate hydration is imperative when you're physically active. Otherwise, you're at risk for dehydration, the inability to replace lost fluid needed for normal body functioning. Dehydration not only impairs athletic performance, especially in a hot environment, but it can be life threatening if not properly managed.

Signs of Dehydration:

- Difficulty concentrating
- Fatigue
- Dizziness
- Nausea
- Cramping

Measuring Dehydration

IRONMAN athletes need to monitor the body fluid they lose. While small amounts are lost through functions like breathing, urination, and defecation, sweat loss during exercise and sports is the most common cause of dehydration. Sweating varies widely depending on the individual, environment, clothing and equipment used. So keep an eye on fluid loss with these easy tips:

- Weigh yourself on a scale before and after athletic activity to measure sweat loss (remember to dry off, as wet clothes alter body weight results)

- Consume 16 ounces (~470 ml) of fluid for each pound (aprox. 1/2 kg) of sweat loss.
- Avoid losing greater than 2 percent body weight from fluid loss.
- Keep an eye on urine color. It should be pale in color. Dark urine may be a sign of dehydration.

Staying Hydrated

Electrolytes like sodium, potassium and chloride—important for proper hydration—are also lost when sweating. Salt/sodium is the primary electrolyte lost and may range from 200 to 1,500 milligrams for every 32 ounces (~946 ml) of sweat lost.

While other electrolytes are important and can be lost in sweat, they are lost in small amounts and typically do not require replacement during training.

For maximum benefit during training and competition, it's best to consume fluids in small amounts every 10 to 20 minutes. Depending on whether or not you need electrolyte replacement, it's easy to consume fluid by drinking water and sports drinks.

Water



Water is a calorie-free form of fluid replacement, best consumed by itself for shorter duration, or less intense competitions such as a 5k run. For longer duration, higher intensity events, or when exercising in extreme heat,

you may need to combine water with other energy and electrolyte sources.

Sports Drinks



Sports drinks provide a combination of fluid, electrolytes and carbohydrates. The sodium provided in sports drinks assists in fluid absorption while also replacing sodium lost through sweat. Sports drinks are also helpful as they may promote drinking of additional fluids due to their sodium content and flavor profile.

A Cautionary Note

Watching fluid intake and loss is also important because drinking too much fluid can lead to a potentially dangerous condition called hyponatremia. Symptoms of this condition are similar to dehydration: confusion, fatigue, nausea and vomiting. The key difference is that hyponatremia will likely lead to weight gain, not weight loss. If you experience any of these symptoms with weight gain due to excessive fluid consumption, you should reduce your fluid intake.

Energy Drinks



Regular energy drinks provide carbohydrates for longer duration events—or may come in sugar-free forms for shorter duration events where glycogen depletion is not a concern. Further, typical energy drinks contain a variety of ingredients, including caffeine and

vitamins, which also provide a boost in energy and performance. While caffeine is known for its ability to improve concentration and increase alertness, the specific effects of caffeine can vary for each individual.

Many athletes display positive effects after consuming caffeine. Others may see few or even negative effects with overconsumption.

For many individuals, as little as 75 to 100 milligrams of caffeine can provide a positive effect on performance. This amount is found in many 8-12 ounce (~237 to 355 ml) energy drinks. Higher amounts of caffeine (up to 200 mg per single dose) are considered safe and may provide additional performance benefits. Since caffeine amounts vary widely among energy drinks, read the labels and know how much caffeine you're consuming.

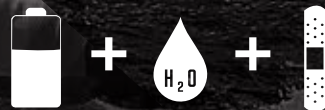
Caffeine typically reaches its peak concentration in the blood about 1 hour after consumption. There are no specific guidelines for when athletes should consume caffeine and it is up to each athlete to determine when and if caffeine is most appropriate.

Energy drinks contain a variety of vitamins, which contribute to normal energy-yielding, metabolism, mental performance and reduced fatigue.

TIPS FOR USING ENERGY DRINKS

- Test caffeine effects during training, well before using it in competition.
- As energy drinks have not been formulated to deliver re-hydration, also drink water / sports drinks during intense exercise or directly diluted energy drinks with water.
- If you have a history of health complications, seek medical advice before consuming energy drinks.

FUELING RECOVERY



When planning nutrition and hydration to improve training and performance, don't forget about fueling for recovery. Proper nutrition recovery helps maximize your training efforts by giving you a head start on the next training session. The objective of a recovery meal is to:

- Replenish energy stores with easily digestible carbohydrates
- Rehydrate with fluid and electrolytes
- Repair muscle tissue with protein

When participating in single-day training sessions, there is ample time to fully recover with your normal diet. However, when training multiple times a day at high intensities, or when recovery times are less than eight hours, recovery nutrition becomes crucial for optimal health and performance.

Within 30 to 60 minutes following training, athletes should consume approximately 1/2 gram of carbohydrates for every pound of body weight (1-1.2 g/kg) in addition to 20 to 40 grams of protein for muscle repair. A recovery sports drink, low fat chocolate milk, or yogurt with fruit will likely meet the carbohydrate and protein needs for optimal recovery for most athletes. Athletes should also consume 20 to 24 ounces (~590 to 710 ml) of fluid for every pound (~450 g) of water weight lost during competition, or until urine color returns to normal.

PRACTICE YOUR PLAN

Just as you practice your chosen sport, you should practice your nutrition plan prior to competition. This allows you to fine-tune it to your bodies needs. Proper nutrition for training and competition truly depends on each athlete and their training goals.

ELEVATE YOUR ENERGY

Carbohydrates Are King

Just like automobiles, our bodies require energy to perform. Carbohydrates are the bodies preferred fuel source because they can be broken down rapidly and used for energy. Unfortunately, there is not enough storage room in the body for carbohydrates to provide fuel for long periods. To maintain your bodies energy levels, you should consume carbohydrates in the form of liquids, solids or gels.

During competition, try to consume simple carbohydrates that are easily digestible, like sports drinks or gels. While competing, it is usually best to avoid consumption of heavy doses of fiber, protein, and fat to decrease possible stomach discomfort and irritability—since they take longer to digest. This is not always the case for low intensity activity, such as hiking, climbing, or ultra-distance running: small amounts of protein or fat may be appropriate for those athletes who are getting hungry. Ultimately, listen to your body to determine which energy sources are most comfortable for you.

Carbs From Solid Foods

During training and some competitions, solid foods can provide bulk and a feeling of fullness. For lower intensity events, solid foods like fruit, sports bars, and breads are

great sources of energy. For many high intensity or short duration competitions such as team sports, this is not the case, as solid foods — which may contain fiber, protein, or fat — require more time to digest.

Carbs From Liquids

Sports drinks typically contain a carbohydrate concentration of 6 to 8 percent, which is optimal for comfortable fluid absorption. This is much lower than fruit juice, which delivers about a 10 to 12 percent concentration of carbohydrates that can lead to stomach discomfort during competition.

For most team sports, such as soccer or basketball, 20 to 40 ounces (~591 to 1183 ml) of sports drink each hour can adequately satisfy carbohydrate and fluid needs.

Carbs From Gels

Gels are heavily concentrated, thus providing an efficient way of consuming energy in the form of carbohydrates. Most gels supply approximately 20 to 30 grams of carbohydrates. Whether before or during competition, it's best to consume gels with at least 12 ounces (~355 ml) of water due to their high concentration of carbohydrates.

RECOMMENDED GUIDELINES FOR CARBOHYDRATES

30 - 75 Minutes

For exercise lasting 30-75 minutes, such as a 5 or 10k race, consuming carbohydrates may not be required, and in some cases may even be uncomfortable for athletes.

1.5 - 2.5 Hours



For exercise lasting 1.5 to 2.5 hours, or for high intensity competition, such as basketball or football, consume 30 to 60 grams per hour. Examples include a 20 ounce (~591 ml) sports drink or an 8.4 ounce (~250 ml) energy drink.

More Than 2.5 Hours



For exercise lasting more than 2.5 hours, such as a triathlon: Consume up to 90 grams per hour. An example includes a 20 ounce (~591 ml) sports drink and two energy gels, through consumption of multiple transportable carbohydrates such as fructose and glucose, or maltodextrin and fructose.

Proper Nutrition & Hydration Are Essential For Optimum Athletic Performance

For serious athletes, good nutrition habits can be the key to unlocking your bodies full potential. Energy intake, hydration status, and recovery strategies each play a vital role in maximizing performance.

Few athletic endeavors compare with the challenge of training for and competing in IRONMAN events. The strategy and science on which IRONMAN athletes rely to safely and optimally fuel their bodies maps a foundation on which all athletes can build. This guide is designed to help all athletes optimize their personal nutrition while participating and safely competing in any sport.

IRONMAN events will have an isotonic beverage, gel, bar and Red Bull® Energy Drink as part of the on-course nutrition. It is best to prepare for race day by training with what will be served on course. Please reference the event information provided by ironman.com to learn what will be offered at your event and be sure to familiarize yourself with product nutrition labels.



Information Provided By

IRONMAN
Sports Medicine Institute

**MEMORIAL
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Since it opened in 2007, the Memorial Hermann IRONMAN Sports Medicine Institute, located in Houston, Texas, has brought together a level of sports medicine expertise in numerous medical specialty areas.

The Institute's dedicated team, which includes renowned affiliated physicians, physical therapists, sports dietitians, strength and conditioning specialists and biomechanists, helps athletes of all ages and abilities from around the world prevent injury, recover from injury and improve performance to reach their personal athletic goals. The Institute is part of the 12-hospital Memorial Hermann Health System in Houston.

To learn more about the institute, visit ironman.memorialhermann.org.

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