

## Basic Nutrition Recommendation for Endurance Athletes by: Peter Cummings

In this article will present a basic overview of information regarding nutrition. Hydration, Electrolytes and Fueling is discussed with recommendations being made for pre-exercise, during exercise and post exercise.

**Pre - Workout Nutrition** - The two hours prior to training/racing

**During Workout Nutrition**

**Post Workout Nutrition** - The 12+ hours after training/racing

When thinking about nutrition athletes should consider three specific areas of nutrition -

**Hydration** - Maintaining proper hydration levels before, during and after training/racing

**Electrolytes** - Avoid hyponatremia and dehydration

**Fueling** - Know your fueling needs and know what works

**Hydration** - Maintaining proper hydration (limiting weight loss to no more than 3% of total body mass) is critical for optimal performance. Physiological functions begin to show signs of being compromised with as little as 1% of total body mass loss. While a slight loss of optimal function starts to appear at this level of dehydration (1% reduction of total body mass) race results show this slight reduction in mass can offset the performance loss by improving power/weight ratio but after 3% of total body mass loss performance and results start to be seriously compromised. **Note** - In the case of 6% total body mass loss health can be seriously compromised and medical care may be needed. Poor hydration is important to many bodily functions with possibly the most important function being maintaining proper core body temperature. Do not underestimate the importance of proper hydration. **Note** - You should lose weight during exercise. If you do not lose weight it could indicate a serious problem. See Section on Electrolytes for more information. **Note** – studies have shown that most athletes walk around in a state of being under hydrated.

A Pint is a pound the world around. Which means 16 ounces is equal to 16 ounces. Weigh yourself before and after training/events. For each pound of weight lost you will need to drink 16 ounces + 25% (4 more ounces) to re-hydrate. Sweat rates of endurance athletes can range from 1 to 2.5 liters per hour or approximately 32 to 80 ounces per hour. While 1.5 liters/hour is about average that is still considerable. It equates to over 3 pounds of weight lost per hour.

Knowing your sweat rate can help you to estimate your hydration needs. Remember, it is not necessary to replace all fluid lost DURING exercise. You have a window of 3% of BW. To do this you must know weight before and after training and account for fluids taken in during event. Example - if during your 90 minute workout you lost 2 pounds pre to post while drinking 2 x 20 ounce bottles during the workout. You actually lost 40



ounces or 2.5 pounds **AND** the 2 pounds that is missing on the scale. Because adding 40 ounces should have increased your weight. Which means that you lost a total of 4.5 pounds. If your total workout time was 90 minutes then your sweat rate is 3 pounds/hour, 48 ounces/hour or approximately 1.5 liters/hour. Believe it or not this is not excessive it is typical.

**Electrolytes** - A very overlooked aspect of hydration is electrolytes. Electrolytes help to maintain proper hydration levels. As you sweat you lose not only water but sodium that is contained in your sweat. While heat acclimation enables your body to dilute the sodium content of sweat we still have surprising high levels of sodium in our sweat. Typically our sweat contains 50 mmol /liter. This is average. Some people have higher concentrations. In our above example this person would be losing 1.5 L/hour with a concentration of 50 mmol or 75 mmol of sodium per hour. Which equates to 1.7 GRAMS of sodium per hour. This athlete would very quickly become hyponatremic (low body sodium) without sodium or electrolyte replacement. The RDA is 2 grams/day of sodium (about 1 teaspoon). The average American Diet, which is thought to be high in sodium, is about 6-8 grams/day. This level is actually a good recommendation for athletes.

Electrolytes help the body to retain fluid in the proper places within the body. Without electrolyte replacement the athlete loses interest in fluids and with stop drinking causing more serious issues. You should lose weight while exercising. The longer you exercise the more weight lose due to sweating you should see. If after a good workout you do not notice a weight loss that makes sense consider sodium intake. You very well could be hyponatremic. Watch for signs of being sick to your stomach, no appetite and no thirst. All could be symptoms.

For athletes exercising in the summer heat it is practical to actually recommend increased dietary sodium. It is also recommended that athletes exercising in the heat never drink just water. Salt should be added to water. Add 0.5 teaspoons of salt to a small water bottle (22 oz).

**Fueling** - Energy is the name of the game in exercise. Work is created by the body by changing chemical energy that is in food to mechanical energy. Without food there is no energy and without energy there is no work or life for that matter.

There are Three (3) Energy Macro Nutrients - Protein, Fats and Carbohydrates. During endurance exercise (exercise longer than 2 minutes) almost all our energy comes from fats and carbohydrates. The body stores enough fat to provide energy for multiple marathons. Replacing fat during exercise is not a concern. On the other hand the body can store only about 500-700 grams of carbohydrates in the form of glycogen and blood sugar and will not allow you to completely deplete this supply. Typically the most you can count on is 50% utilization. The rest must be supplied during exercise.



It is common for triathletes to burn somewhere between 600-1000 calories/hour when competing and training. The higher the intensity of exercise the greater the utilization of carbohydrates versus fats to supply the energy needed. Luckily the shorter races demand these intensities while the longer races will demand energy at a slightly lower rate thereby allow a higher percentage of the energy to come from fat stores. So, in shorter races like Sprint and Olympic distance races intensity is high and the percentage of carbohydrates used is higher but the total calories needed is less due to the shorter duration of these events. Conversely, the longer events like Half and Full Ironman races are longer but allow for more fat utilization.

Athletes need to understand these demands or risk under-performing or risk bonking. It is difficult to replace more than 1 gram/kilogram of body weight/hour of carbohydrate during exercise. Digestion becomes difficult at levels above this. So, a 70 kilogram athlete (154 pounds) can't really expect to be able to consume more than 70 grams of carbohydrate per hour or about 280 calories. More than that is difficult and starts to risk GI distress. You can train this ability but knowing your limits is important. Some athletes have been trained to be able to supply 1.5 grams/kilogram of BW/hour. This same 70 kilo athlete could then consume up to 105 grams or over 400 calories per hour. As you can see from the above numbers if you are using 600-1000 calories per hour but can only replace 280-400 calories you must hope to be efficient enough to use high level of fat for energy. Athlete must maximize glycogen storage prior to exercise and properly replace the energy during exercise to optimize training and racing.

### **Basic Nutritional Recommendations for Endurance Athletes:**

**Immediately Prior to Exercise or Event** - Consume a small meal with sports drink or water containing approximately 200-400 calories (50-100 grams) of carbohydrates approximately 2 hours prior to training. In the 30 minutes just prior to beginning exercise take in 8-16 ounces of sports drink with electrolytes.

**During Exercise or Event** - Start by knowing your needs. Calculate your sweat rate in the different conditions you train and race in and be prepared to replace 16-32 ounces per hour. Athletes with higher sweat rates need to consider drinking even more than this. Be sure to add salt to the drink. Even if you are drinking sports drink a little additional sodium can be added. As for fuel, athletes must practice fueling in training to be successful racing. Understanding the energy needs highlighted above helps to create an outline for experimenting. Athletes must try different types of carbohydrates to see what works best for them. AND see what works for them in different conditions. Warmer conditions often call for a reduction in intake. Know your body, know your needs and have a plan that you have tested in training.



**Post Exercise or Event** - Immediately following training or racing it is critical for athletes to use this time to begin recovery nutrition. Other than sleep nothing is more important to recover from exercise than nutrition. Athletes should immediately weigh themselves and re-hydrate 125% of weight lost with fluids (note - not sweat rate but actual weight lost). Within the first 20 minutes post exercise besides water the athlete should attempt to take in 50 grams of carbohydrates and 10-15 grams of protein. Within 2 hours after athletes should have another complete meal.

#### **Other Notes/Recommendations:**

Remember - A pint is a pound the world around.

Know your sweat rate. This is will help you prepare a hydration strategy.

Check your weight loss after exercise and pay attention to your drink consumption during exercise. This will verify your need to rehydrate.

Most athletes exist in a state of dehydration and incomplete glycogen replacement. Don't be that guy.

Salt is NOT your enemy. Athletes should not follow low sodium diets and should actually increase salt intake during warm weather training and racing.

Know you body, know your fueling. Know what works for you in different conditions by PRACTICING it.



Peter Cummings specializes with training with Power meters and the use of the TrainingPeaks platform and WKO+. He was certified by the American College of Sports Medicine in 1993. He is a Certified and Licensed USA Cycling Level II Coach with Distinction, and Certified USA Cycling Skills Instructor. As a health club owner and coach he has directed and overseen the programming of over 10,000 individual and has been racing bicycles since 1991. His athletes have won 8 Nationals Championships, qualified for World Championships, won over 15 State championships and many other Local championships and races. He is available for consultations, presentations, testing, programming or coaching. Those interested can contact him at [Peter@Plan2Peak.com](mailto:Peter@Plan2Peak.com). For more articles on training and racing by Coach Cummings visit the Resource Page of his website [www.plan2Peak.com](http://www.plan2Peak.com).

