

Nutrition & Hydration for Swimmers

Fueling for Performance

Always have a full tank!

Get the most economical fuel!

Fuel at the right times and places!

The Basic Nutrients The basic nutrients are carbohydrates, proteins, fats, vitamins, minerals and water. Carbohydrates are the primary fuel source for aerobic athletes and, contrary to popular opinion, are not fattening. If taken in reasonable amounts, carbohydrates are used for energy, leaving little to be converted to body fat. Protein builds and repairs muscle, produces hormones, supports the immune system and replaces red blood cells. Protein is not a main source of energy except in cases of malnutrition or starvation. Most athletes do not need extra protein. They get adequate protein from a normal diet. Again contrary to popular opinion, protein does not build muscle bulk, only exercise does that. Fats are essential for hormone production, storage of vitamins and delivery of essential fatty acids. The body needs fat, but the average American diet contains more than enough. High fat foods should be traded for low fat substitutes so that fat intake is limited to 25% of total calories. The necessary vitamins and minerals are also readily available in the foods consumed in a healthy diet. Vitamins, minerals and water make the body more efficient at accessing carbohydrates, fats and proteins when they are needed during exercise and recovery. In terms of total calories, swimmers should aim for a diet of:

60% carbohydrate

15% protein

25% fat

Of course this will vary but carbohydrate intake shouldn't drop below 50%, protein should not go above 25% and fat should not go above 30%. There are no magic foods and no magic food groups! Extra vitamins, minerals and supplements are not necessary in a healthy diet. The easy guidelines for your athletes are as follow:

Eat colorful foods. The more naturally colorful the more vitamins, minerals, antioxidants and carbohydrates are available for recovery and general health.

Eat early and often. The first two hours post-workout are the most critical.

Drink early and often. Hydration must be continuous. (See Hydration.)

Recovery Nutrition After exercise, the dietary goal is to provide adequate energy and carbohydrates to replace muscle glycogen and ensure rapid recovery. Start the replenishment process immediately. The "window of opportunity" to maximize glycogen replacement lasts only about 2 hours. It is also advisable to pulse the system, i.e. eat something substantial every hour rather than waiting for a large meal or eating only every 3 to 4 hours. The replenishment should be adjusted according to the intensity of the practice. A less intense workout requires less replenishment. Finally, something is better than nothing so emphasize consuming some carbohydrate fuel immediately after workout rather than waiting until the next full meal.

Nutrition for Competition

Once again, teach athletes that there is no magic food and that they must focus on long term nutritional choices. When it comes to swim meets, they need to prepare nutritionally for the entire competition. There is no way to fuel for a particular race. It is important to maintain constant energy, blood sugar levels and hydration by snacking and replenishing throughout the competition. Shown below are some recommendations for "competition cuisine":

Sussex County YMCA
15 Wits End Road Hardyston, NJ 07419
(973) 209-9622
Fax: (973) 209-1483
www.sussexcountyyymca.org

One Hour or less to go

Fruit and vegetable juice such as orange, tomato or V-8

AND/OR

Fresh fruit such as apples, watermelon, peaches, grapes, or oranges

2-3 hours to go

Fresh fruit and vegetable juices

AND

Breads, bagels, English muffins with limited amounts of butter, margarine, cream cheese, or peanut butter

3-4 hours to go

Fresh fruit and fruit and vegetable juices

AND

Breads, bagels, baked potatoes, cereal with low-fat or skim milk, low-fat yogurt, sandwiches with a small amount of peanut butter or lean meats and cheese

AND/OR

1 ? cups of a sport drink

AND/OR

4 cups of a sport drink

AND/OR

7 ? cups of a sport drink

The best pre-practice or pre-meet meal should contain primarily carbohydrates. Carbohydrate-rich foods like pasta, breads and cereal are easily digested and absorbed. (Rule of thumb: 0.5 - 2.0 grams of carbohydrate per pound of body weight one to four hours prior to exercise.) Remind parents and swimmers that it is crucial that swimmers eat before morning practice. Some swimmers will resist a meal before morning practice or the early morning session of a swim meet. Remind swimmers of the analogy of the empty gas tank. If they have not eaten since the previous evening, the gas tank is empty and there is no fuel to produce energy for competition or training. Some of the items below are well tolerated before morning practice or competition.

Meals that provide 100 grams of carbohydrates

- 1 bagel with peanut butter and 2/3 cup of raisins
- 1 cup of low-fat yogurt, 1 banana and 1 cup of orange juice
- 1 turkey sandwich with 1 cup of applesauce
- 2 cups of spaghetti with meat sauce and 1 piece of garlic bread
- 8 oz. of skim milk, 1 apple, 1 orange, 2 slices of bread and 3 pancakes
- 1 serving of sports drink and 1 bagel

Energy Drinks As a consumer and also as someone who gives advice to swimmers and parents, remember that the coach is part of a target audience for the manufacturers of so-called energy drinks. Advertisements, images and slogans are created for a purpose - to convince consumers to buy the advertiser's product. Each drink is different, but most energy drinks contain a cocktail of fancy, high-tech-sounding ingredients which are not regulated, have little or no nutritional value, and can be potentially harmful given that many of them can enhance the potency of stimulants in the drinks. The amount of caffeine and other stimulants or stimulant-like herbs in energy drinks can also be a cause for alarm as the side effects from the repeated or misused consumption of these drinks could potentially be a health threat. Stimulant abuse has a range of possible side effects including:

- Addiction and withdrawal symptoms
- Dehydration - For instance, the diuretic quality of caffeine can have a dehydrating effect, potentially leading to other side effects, including less blood being pumped with each heart beat, cramping and, ultimately, exhaustion
- Anxiety
- Tremors
- Increased heart rate and blood pressure
- Possible cardiac arrhythmia (an abnormality of the rhythm or rate of the heart)

- Insomnia

Thus, in many cases, energy drinks may actually bring on fatigue and interfere with optimal athletic performance. Any stimulant effect may be short lived or non-existent. Not only can high amounts of stimulants be harmful to the athlete's body, but there is no documented health benefit in consuming "stimulant" drinks. A person may feel good for a short period, but once the body starts to use up the substantial quantities of sugar in these drinks, the effects of the caffeine and other stimulants wear off causing a "crash" and leaving a tired and drained feeling. When energy drinks are consumed and a short-term "rush" or feeling of stimulation is experienced many people think that they are getting energy. This is not true. What they are frequently getting is a large dose of caffeine with some carbohydrates thrown in as a side order. It is a recipe for short-term stimulation and long-term fatigue.

The best piece of advice to teach athletes and parents is that the energy needed to sustain difficult and long training schedules and other daily activities and responsibilities is not going to be found in a can or a bottle. The only reliable way to maximize peak performance is to evaluate and modify the dietary intake to ensure that the athlete is meeting the nutritional requirements for the body and level of energy output.

Keys to Hydration

Water is one of the basic nutrients necessary for overall health and athletic performance. Fluids are necessary for two primary reasons: to stay hydrated and to provide the body with fuel.

During Workout Regardless of age or length of practice, all athletes need fluids to stay hydrated. This is easily accomplished with a couple of sips from a water bottle every 15-20 minutes. As athletes progress, practices get longer and tougher. It's well established that athletes who exercise beyond 90 minutes benefit from a supplemental fuel source which a sports drink can provide. Years of research shows that drinks that are 6-8% carbohydrate by weight provide the perfect balance between fuel and hydration. A couple of sips every 15-20 minutes keep the body fueled, helps prevent unnecessary tissue breakdown and maintains hydration. Gatorade and Powerade fit this 6-8% rule.

After Workout Water is an excellent choice to replenish fluids after practice. It's always wise to drink at least one cup. But after a hard workout, replenishing fuel stores is equally important. Each hour after practice, athletes need a little over 1 gram of carbohydrate for every kilogram (2.2 lbs.) they weigh. This replenishing must begin within the first hour. A sports drink that is 6-8% carbohydrate by weight is easily digested and quickly absorbed and can provide a convenient way to get some of the necessary fuel within the first 20 minutes. High protein drinks often forgo the carbohydrate and carbohydrate is what must be replenished within the first hour after workout. A little protein won't hurt; in fact it may actually help by supporting the tissue repair and re-building processes. But too much protein, especially when it comes in place of carbohydrate, may be detrimental to the post-workout recovery process. Remember, carbohydrate is the primary fuel source during hard exercise. Glycogen, the storage form for carbohydrate, is what the body taps into for fuel when exercise is very intense. Protein is used as a fuel source during exercise only when carbohydrate and fat are not present in sufficient quantities. If an additional carbohydrate source is not supplied, the body taps into stored protein, the muscles. This is why it is good to drink carbohydrate-electrolyte solutions during workout, to spare muscle protein. This is also why it is important to replace carbohydrate stores lost during a workout in order to start the next workout with a full tank of gas.

During the Day Staying hydrated during the day is just as critical as hydrating during and after workouts. Most athletes can do this by incorporating a variety of fluids into their daily diets such as water, fruit juice, milk and soups. Remember that variety is the key to a healthy diet. If swimmers use a sports drink during and after practice, it may be better to drink water and

juice during the day to stay hydrated. Juices are often healthier than sports drinks in that their sugars are natural. Always keep in mind that juices and sports drinks contribute to total caloric intake.

Fluid Replacement Tips for Swimmers

- Keep a fluid bottle by the side of the pool when working out and drink between repeats and sets.
- Choose sports drinks that taste good, stimulate fluid absorption in the body, maintain proper fluid balance in the body and provide energy to working muscles.
- Avoid carbonated drinks which can cause stomach bloating and may reduce fluid intake.
- Avoid caffeine-filled beverages which are diuretics and contribute to fluid loss.
- Check the color of the urine. Dark-colored urine may indicate dehydration and the need to consume additional fluids.