

NUTRITION FOR SWIMMERS

Courtesy of Aaron Schwartz M.S., R.D., L.D.

Nutrition is the one part of most athletes' training that gets neglected. I have studied nutrition for seven years and have plenty of experience working with people that struggle with nutrition. Why is that? For one, most athletes don't consider nutrition as training. Like just about anything, nutrition requires consistency to see results. Sure, you can get by with your training without even thinking about nutrition; a proper diet isn't necessary if you're looking to just "get by". Our bodies are efficient and can turn whatever junk food we throw at it into a usable fuel. However, I would argue that to maximize your workouts, truly see your full potential, nutrition should be viewed not only as part of your training but the most important part. If you consistently invest in your health through nutrition, I guarantee that over time you will feel and perform better. It's easy to get discouraged when the quick fixes and miracles diets that the world we live in promises fail to yield results. I encourage you to ignore what this world says and start investing in your health through a consistently healthful diet, simply by eating real food. Here are some tips to get the athlete started:

1. Make most of your carbohydrates complex outside of workouts.

Carbohydrates have taken a beating lately from the most recent fad diets to the popularity of both the Atkin's and Paleo diet. No, carbohydrates are not inherently bad for you but I will agree the Western Diet consists of entirely too many carbohydrates. With, carbohydrates are, or should be, an aerobic athlete's best friend. The literature is riddled with study after study demonstrating the benefit and importance of a high carbohydrate diet for athletes, particularly aerobic athletes. Simply put, carbohydrates are the body's fuel currency. No other nutrient burns as efficiently as the carbohydrate does. The Academy of Nutrition and Dietetics, the American College of Sports Medicine and the Dietitians of Canada all agree that carbohydrates should make up most calories in your diet. Want numbers? A range, albeit large, of 6 to 10 grams of carbohydrates per kilogram of body weight is recommended. Swimmers and other mostly aerobic athletes will need closer to 8-10 g/kg.¹ For a 160-pound person, this turns into 580-720 grams of carbohydrates. Outside of the actual workout itself, the carbohydrates that you want to focus on are complex carbohydrates. Examples include: Legumes (lentils, beans and peas), Whole Grains (oats, brown rice, and whole grain breads), Fruits and Vegetables.

2. Simple carbs directly before, during and directly after workouts.

It may come as a surprise to you that simple carbohydrates (or simple sugars) are not always bad, especially for athletes. Simple sugars are digested very quickly (thus the name simple) and will result in a rapid rise in our body's blood sugar. This is typically unwarranted because if that blood sugar is not utilized, say, through exercise for example, then it will be stored in a fat cell. However, the up-side to simple sugars is that it provides a quick, easy-to-burn fuel for our muscles. Sports drinks are an excellent example of this. The carbohydrates in sports drinks are simple sugar which makes it a great, ready-to-burn fuel source during a workout. Simple sugars are important directly after a workout due to the insulin response which will be discussed shortly. Other examples include pretzels, honey and fruits.

3. A little protein before a workout goes a long way.

Protein before a workout may sound counterintuitive. However, a small dose of protein can prime your muscles for recovery even before you start your workout. In fact, The ISSN recommends consuming 0.15-0.25 grams of protein per kilogram of body weight an hour or so before a workout (about 15 grams for a

160-lb. person).² The reason? Protein before a workout helps establish a positive nitrogen balance thus improving the uptake of protein into the muscle, preventing the breakdown of muscle tissue and delays gastric (fancy word for stomach) emptying which in turn increases satiety and prevents hunger during training.

4. Strive for a 3-4:1 Carb-to-Protein ratio after a workout.

It's no secret that protein is beneficial after your workout. In fact, protein is not only critical for muscle building but also for effective recovery. However, you may not know that consuming carbohydrates with that protein post workout is just as important. The carbs not only replenish glycogen stores but also stimulates a greater insulin response. Insulin drives sugar along with amino acids (the building blocks of protein) into cells, including muscle cells, for more efficient use of the protein we consume. The goal is to strive for a 3-4:1 ratio. That is, 3-4 grams of carbohydrates for every 1 gram of protein. Chocolate milk is a great example.

5. Protein: Quality over Quantity.

Try not to get too caught up with consuming loads of protein. A recent journal article that came from the Journal of the Academy of Nutrition and Dietetics showed little difference in protein absorption and synthesis when comparing a 30-gram protein dose with a 90-gram

protein dose.³ What happens to all of that extra protein that doesn't get synthesized in our muscle? Most of it will be stored in fat cells. What's more important is the quality of protein. The buzz word dietitian's like to throw out is "high-biological value" (HBV) protein. That's a fancy way of describing how usable the protein is. A HBV protein is one in which contains all the essential amino acids that are required by humans and will thus vastly improve muscle repair after a workout. Whole eggs, milk, fish, beef and soy beans are among the proteins with the highest biological value. Vegetarian? That's okay, be sure to mix and match your plant proteins to meet all your essential amino acids.

6. Balance is key.

I'm sure you're tired of hearing "strive for a well-balanced diet". Well, I'm sorry to say but that statement still holds true. The main reason why a well-balanced diet is essential is to ensure that you meet your body's necessary vitamin and mineral requirements. These micronutrients may be small but carry an important weight for performance and overall health. For example, phosphorous is an essential mineral and key component to our body's unit of energy, ATP. Calcium is not only important for our bone health but also aids our muscles ability to contract. Vitamin B₁, Thiamin, is essential for carbohydrate metabolism. Other vitamins and minerals are responsible for red blood cell synthesis, amino acid synthesis, energy production and anti-oxidant function, all of which serve critical roles in maximizing performance. A well-balanced diet should consist of complex carbohydrates, lean meats, dairy and plenty of fruits and vegetables. The more color, the better.

7. Vitamin D for building muscle?

Among those micronutrients, vitamin D is gaining popularity in the realm of sport performance. Along with its role in bone health, vitamin D is now being studied for its role in muscle health and strength as well. It turns out that vitamin D has an important role in muscle synthesis and muscle contraction. Additionally, muscle weakness is a noticeable feature of people who have a vitamin D deficiency.⁴ There are few food sources of vitamin D however fifteen solid minutes of sunlight exposure will provide you with your required daily dose. This can pose a problem during winter months and especially for swimmers who train strictly indoors. In fact, vitamin D deficiency seems to be common among swimmers.^{5,6} Food sources

include fatty fish (tuna, salmon and mackerel), cheese, egg yolks and fortified milk. It's important to note that one study showed that supplementing with 4000 IU (100 mg) of vitamin D in NCAA swimmers and divers was effective in maintaining vitamin D status.⁷ Speak with your physician first prior to supplementing.

8. Hydration

One of my favorite questions to ask athletes is, "what is the single most influential nutrient for sports performance?" Would you guess water? In fact, it is and I would argue that it is also the most overlooked and taken-for-granted nutrient by athletes as well. Dehydration can reduce the body's capacity to do work by about 30%. This effect is further exacerbated in aerobic athletes when as little as 2.5% body weight loss due to dehydration turns into a 45% decrease in exercise performance.⁸ Being adequately hydrated can easily be the difference between first and second place. The most accurate assessment for hydration status is the color of your urine. Weight change after a workout should be used to replenish what was lost. Strive for consistent pale-yellow urine and replace each pound of weight loss after a workout with 16-24 ounces of fluid.

References:

1. Rodriquez, N. R., DiMarco, N. M., & Langley, S. (2009). Position of the American dietetic association, dietitians of Canada & the American college of sports medicine. *Journal of the American Dietetic Association*, 109(3), 509-527.
2. Kersick C., et al. (2008). International Society of Sports Nutrition position stand: Nutrient timing. *Journal of the International Society of Sports Nutrition*, 5:17-29.
3. Symons T., et al. (2009). A moderate serving of high-quality protein maximally stimulates skeletal muscle protein synthesis in young and elderly subjects. *Journal of the American Dietetic Association*, 109:1582-1586.
4. Moran D., McClung J., Kohen T. & Lieberman H. (2013). Vitamin D and physical performance. *Sports Medicine*, 43:601-611.
5. Constantini, N.W., Arieli, R., Chodick, G., & Dubnov-Raz, G. (2010). High prevalence of vitamin D insufficiency in athletes and dancers. *Clinical Journal of Sport Medicine*, 20, 368-371.
6. Halliday, T.M., Peterson, N.J., Thomas, J.J., Kleppinger, K., Hollis, B.W., & Larson-Meyer, D.E. (2011). Vitamin D status relative to diet, lifestyle, injury, and illness in college athletes. *Medicine & Science in Sports & Exercise*, 43, 335-343.
7. Lewis, R.M., Redzic, M., & Thomas, D.T. (2013). The effects of season-long vitamin D supplementation on collegiate swimmers and divers. *International Journal of Sport Nutrition and Exercise Metabolism*, 23, 431-440.
8. Jeukendrup, A., & Gleeson, M. (2010). *Sport nutrition: An introduction to energy production and performance* (2nd Ed.). Champaign, IL: Human Kinetics.