

# Recovery Nutrition

Scott Josephson, MS

**C**an you relate to this? You are finishing a really hard workout and the primary thought in your mind as the workout winds down is “now I’m going to relax.” So once the workout is completed, that is exactly what you do. Once you’ve finished your physical training, you are still not finished training. How well you recover today will be a huge factor in how well you perform tomorrow. You must consider the recovery process as part of your training process. If you give equal emphasis to the recovery part of your training as you do the actual training, you will enhance your performance tremendously and keep yourself as healthy as possible.

We’ve all heard about the “window of opportunity” that’s present immediately after a workout. Optimally, an athlete needs to take advantage of helping the body “refill the tank.” Your body will adapt to the training you’re putting it through by storing more glycogen, its primary fuel source. This adaptation process is allowing you to put your system through another strenuous training session, and be more prepared by having a reservoir of available fuel. It makes perfect sense to replenish essential nutrients shortly after a workout when the body’s supplies have been depleted or exhausted. If you do not recover properly, you will not be ready to perform well during your next training period.

Optimally, you want to rid your muscles of lactic acid and other waste products. Proper recovery will allow you to restore nutrients, get rid of lactic acid, and refuel energy storage. Intense physical activity is likely to lead to a severe depletion of carbohydrate stores (glycogen) and dehydration. It is important to start replenishing carbohydrates soon after exercise. Also, glycogen synthase, the enzyme that controls glycogen storage, is highly active immediately after exercise when muscle glycogen stores are low.

The amount and type of carbohydrate used for recovery will depend on various circumstances, but there are advantages to liquid forms. Liquid forms are more convenient, can satisfy thirst, require minimal preparation, and are extremely portable. Sports drinks that are formulated specifically for recovery are less likely to contain large amounts of protein, fat, and fiber. These can slow gastric emptying, and impede the recovery process. Fluid replenishment is a vital component of post-exercise recovery.

Water and electrolytes are lost through sweat, and glycogen and protein must be replaced as quickly as possible to ensure that the athlete is ready for the next workout. You can jump start the muscle recovery window by consuming a sports drink containing electrolytes, carbohydrates, and protein. The nutrient content of the drink will result in smaller nutritional deficits after the workout. For the most part, sports drinks have been formulated to contain carbohydrates and electrolytes, however some of the newer drinks now contain protein and antioxidants as well. Sports drinks that offer approximately 14 grams of carbohydrates per 8 ounces are best. This carbohydrate level delivers the optimal amount of both energy and fluid to aid in recovery. Sports drinks that contain mostly fructose can slow down absorption and cause stomach cramps. It is best to look for drinks with a higher percentage of fast-absorbing carbohydrates such as glucose, sucrose, and maltodextrins with approximately 100 milligrams of sodium. A carbohydrate solution (6% – 8%), rather than plain water, will maintain a sufficient concentration of blood glucose and help sustain a high rate of recovery.

Carbohydrates, vitamins, and minerals all play important roles in recovery. Many foods that contain carbohydrates, protein, and a small amount of fat are excellent for helping with recovery. By taking in ample amounts of carbohydrates immediately after training, and again within the next three hours, athletes can get a head start on refueling their muscles after workouts. Carbohydrates are essential in rebuilding muscle cells, and for boosting the production and release of insulin from the pancreas. Insulin is an anabolic hormone that has a positive impact on protein synthesis in muscles, and tends to suppress protein breakdown. Muscle cells are highly receptive to insulin, the hormone responsible for transporting glucose and amino acids

through the blood stream and into the muscle cell. Consuming carbohydrates within 30 minutes of completing an intense workout will synthesize twice as much muscle glycogen as if you wait several hours before refueling. Essentially, the two most important components of recovery are replenishing the glycogen fuel burned during the workout, and rebuilding the muscle proteins that are destroyed. The sooner we begin, the better chance of recovery for the next training session.

During intense workouts, muscle protein is damaged, which leaves an athlete with a net loss of muscle protein. Similar to glycogen synthesis, protein rebuilding proceeds much faster in the first 2 hours following intense exercise. It has been suggested that the optimal formula for post-exercise nutritional recovery be 4 grams of carbohydrate for every 1 gram of protein<sup>1</sup>. I agree with this formula, and have utilized it with many athletes with whom I consult. The 4:1 ratio of carbohydrates to protein maximizes insulin release, and maximizes the rate of glycogen/protein synthesis.

Generally speaking, a person can consume approximately 1 gram of protein per every 10 pounds of body weight, within an hour or so of completing an intense workout, and approximately 4 times that amount of carbohydrates. Many athletes who I have worked with were consuming way too much protein, and not enough carbohydrates after their training sessions. It is important to realize that more carbohydrate than protein is burned during your workout. Consuming large amounts of protein will slow down gastric emptying and severely alter the muscle recovery window. Carbohydrates and proteins may result in a greater stimulus for muscle glycogen storage. Optimizing the muscle glycogen storage has important implications for athletes that are exercising intensely. Since the purpose of post-exercise feeding is to replace the muscle glycogen and protect lean body mass, athletes must replace adequate calories that were lost. The amount needed depends on the size of the athlete, the degree of carbohydrate depletion, and the severity of fluid loss. Overall, carbohydrates eaten immediately post-exercise, are rapidly stored in the muscles as glycogen. These carbohydrates give stressed muscles the fuel needed to speed up the recovery process.

Electrolyte replacement is also crucial. Athletes can replace these electrolytes by consuming fruits, vegetables, sports drinks, as well as other foods and beverages. Electrolytes help control the energy used for normal bodily functions, including muscle contractions. Replacing electrolytes is an extremely important part of nutrition recovery, as performance can be severely altered if adequate levels of electrolytes are not present. The solution for proper electrolyte replenishment during intense exercise is to do it gradually so it does not override normal body mechanics. In other words, do not try to replace all the fluids at one time, as this can lead to hyponatremia (over diluted blood sodium levels). Electrolytes are beneficial by maintaining a proper balance of sodium, potassium, and magnesium that help prevent muscle cramps during and after exercise.

Remember, even after your workout is completed, there is still work to do. Putting these principles into practice will help lead you in the right direction, and enhance your recovery process.

## References

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## Suggested Reading

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## About the Author

Scott Josephson, MS, is the Director of Fitness and Dietitian at Hunters Run a premier private property in South Florida. As an exercise physiologist and practicing dietitian, he specializes in healthy weight achievement and overall wellness. Scott instructs continuing education workshops for Exercise Etc., I.D.E.A., and is a contributing writer for Fitness Management publication and ECA World Fitness Alliance. He can be contacted at [brfitness@mindspring.com](mailto:brfitness@mindspring.com).