



TAS ATHLETICS

Creating the Best Environment for Muscle Recovery

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After an arduous bout of exercise, the body's fuel reserves are depleted and need replenishment as soon as possible to stimulate growth and recovery. Depending on the length and intensity of the exercise or activity, our body's muscle energy stores can be severely depleted, resulting in muscle protein breakdown. Muscle conditions following exercise include (Kumar, Atherton, Smith, Rennie; 2009):

1. Depletion of muscle glycogen (energy) stores
2. Increase in free radicals (body-damaging molecules)
3. Decrease in muscle protein synthesis (ability of body to repair damaged muscle)
4. Increase in muscle protein degradation (muscle structural damage increase)
5. Decrease in plasma volume because of fluid loss (causes dehydration from loss of electrolytes)

So what can we do about it?

In order to get our body into recovery mode after exercise, there are several things we need (Brown, 2017):

1. Carbohydrates (replace lost glycogen within the muscle and liver)
2. Protein (stimulate muscle protein synthesis and help repair damaged muscle)
3. BCAAs (especially Leucine, Isoleucine, and Valine; BCAAs are the building blocks of protein)
4. Electrolytes (particularly sodium, potassium, magnesium, calcium, and chloride)

Replacing lost carbohydrates, which are stored as glycogen in the muscle and liver, and protein, a macronutrient responsible for stimulating muscle protein synthesis, creates a more complete muscle recovery environment. A ratio of 2:1 carbs to protein is sufficient for post workout muscle recovery (Brown, 2017). In a 2010 study on the role of post-exercise nutrient administration on muscle protein and glycogen synthesis, individuals confirmed that protein or amino acid ingestion following weight training is required to create a positive protein balance, and carb intake during the recovery process is the single most important factor to replenish glycogen stores (Poole C, 2010). This shows the direct connection these two macronutrients have on stopping catabolic (breakdown) processes in the body, initiating anabolic (building/restoration) pathways.

Consuming protein and carbs post-workout are a great way to kickstart recovery, however, fluid balance must also be taken into account. Electrolytes are minerals that facilitate electrical conduction throughout the body and regulate water balance. When you sweat during a workout, you lose these electrolytes in the process. The body, now running low on these essential minerals, will start to slow down and the individual could experience muscle fatigue, performance impairment, an irregular heartbeat, or even muscle cramps. Therefore, replacing these either during or right after intense exercise is a must. Benefits can include:

1. Replenishment of glycogen stores in the muscle and liver
2. Decrease or stop in muscle protein breakdown
3. Initiation of muscle protein synthesis

Post-workout recovery drinks or supplements are one of the best ways to get our body the nourishment (protein, fast digesting carbs, and electrolytes) it needs in a fast and efficient manner. Not to say we can't get the same nutrients from whole foods, but they will take much longer to break down and get into our system.

These supplements are highly digestible and are transported where we need them most, much faster and with less energy expenditure by the body. Supplements should **NEVER** be a replacement for whole foods and a sound nutrition plan, but they can be beneficial around the "workout window," which is two hours before and after exercise. They can be especially useful for people who are not able to eat a meal following exercise due to nausea or lack of appetite.

References

- Brown, Ben. "3 Proven Nutrients to Include in a Post-Workout Recovery Drink." *BSL Nutrition*, BSL Nutrition, 13 May 2017, www.bslnutrition.com/post-workout-recovery-drink/.
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