

# **Post Workout Recovery and Core PWO**

Post workout (PWO) nutrition is absolutely crucial to reaching your fitness and physique goals. The immediate goal post workout is to maximize glycogen storage and protein synthesis while at the same time minimizing protein breakdown and catabolic (muscle wasting) hormones. Proper PWO nutrition will help the body repair muscle tissue, reduces post-workout soreness, raises testosterone and growth hormone levels, and reduces cortisol levels. In order to accomplish this, one needs the correct supply of carbohydrates and amino acids.

Core-PWO was designed to take the guesswork out of PWO recovery. This product contains the fast-acting proteins and carbs (whey isolate, dextrose, and maltodextrin) needed to maximize muscle recovery after weight training. These ingredients quickly replenish muscle glycogen and shuttle much needed amino acids to muscle cells. In addition, Core-PWO contains added branch chain amino acids (BCAAs), glutamine, taurine, and antioxidants to help prevent catabolism and improve muscle growth and recovery.

Whether you are bulking up or slimming down, all of these ingredients are crucial for proper recovery. Let's take a detailed look at the contents of Core-PWO and break down the theory behind post workout recovery.

## **Carbs**

As mentioned above, one of the main goals post workout is to restore muscle glycogen, which has been depleted during the workout. The body will even break down muscle tissue for this purpose if adequate carbohydrates are not available. For this reason, it is vital to include carbohydrates in the post-workout drink.

As glycogen and glucose is used for energy during your workout, blood glucose levels begin to drop-off. This leads to a sharp decrease in insulin levels and this decrease of insulin gives rise to the catabolic hormone cortisol. Cortisol is used to convert muscle tissue to proteins for conversion into glucose when stored energy forms are depleted. Your body will go into a process called gluconeogenesis which produces glucose from amino acids in the liver.

This high level of cortisol and low level of insulin must be reversed immediately following a workout in order to create an anabolic environment. Cortisol can be quickly suppressed and gluconeogenesis can be halted by a burst of insulin caused by fast-acting carbs (high on the glycemic index). High GI carbs raise blood sugar and hence insulin levels quickly. Post-workout is the one time of day you want to eat these insulin-spiking carbs. Normally, it is best to eat lower glycemic foods (such as Core-MRP) so as avoid large swings in blood sugar and an insulin spike. But post-workout, the opposite is true. Fast acting carbs will cause an insulin spike, which will stimulate glycogen storage, shuttle carbs into the muscles, increase amino acid utilization, and blunt cortisol.

The ideal fast-acting carbs for PWO nutrition are dextrose (glucose) and maltodextrin (glucose polymers). Dextrose can be absorbed directly through the gut into the bloodstream and can cause an insulin response faster than any other carb. Additionally, since dextrose is already in the form the body requires, it can be used immediately for glycogen replenishment.

Even though maltodextrin is considered a complex carb, it is ideally suited to be used PWO because it is essentially a chain of loosely bonded glucose molecules. Like dextrose, maltodextrin is absorbed directly through the gut and raises blood sugar and insulin levels very quickly. However, before maltodextrin can be fully utilized and incorporated into muscle glycogen, it must first pass through the liver for the bonds between the glucose molecules to be broken. Even though it cannot be utilized to replace muscle glycogen as fast as dextrose can, because it is metabolized slower, there will not be as quick of a drop of insulin and blood sugar levels as with dextrose. Therefore, a mixture of both dextrose and maltodextrin, like that is found in Core-PWO, is ideal for a post workout recovery shake.

It is vital to get these carbs to the muscle cells as quickly as possible following a training session; the sooner you begin the recovery process, the more likely it will be completed in time for your next training session. As soon as your workout is finished, you should consume a liquid meal that is rich in high-glycemic carbs (and amino acids). Your post workout liquid meal should also avoid fat and fibrous carbs which will slow down absorption and non-beneficial sugars such as fructose, sucrose, and lactose.

## **Protein**

In addition to replenishing the glycogen fuel burned during the workout, rebuilding the muscle tissue that was torn down during the workout is also a crucial component to muscle recovery.

Protein and carbohydrates work hand in hand post workout; both glycogen and protein synthesis proceed faster when carbohydrates and protein are consumed together. In addition to blunting cortisol and stopping gluconeogenesis, the carb induced insulin response will help shuttle amino acids to the muscles. An influx of amino acid will create a positive nitrogen balance and thus an anabolic environment for building and retaining muscle.

Similar to carbs, the quicker the protein can be delivered to the muscle cells, the sooner the recovery and repair process can begin. Whole food sources of protein should be avoided immediately post workout because it takes too long for the body to break down these high protein foods. Ideally one should incorporate a fast acting protein source such as whey protein isolate or hydrolyzed whey into their PWO shake. Like whole foods, slower digesting protein powders such as casein, egg, and soy would not be ideal post workout.

In addition to utilizing cross-flow microfiltered whey protein isolate, Core-PWO contains additional BCAAs and glutamine. BCAAs (leucine, isoleucine, valine) are quickly absorbed into circulation and immediately available to be used rebuild muscle proteins. Leucine itself has been shown to have a greater stimulatory effect on protein synthesis than any other amino acid. Adding BCAAs, in addition to whey isolate, only further increases the rate of skeletal muscle protein synthesis post workout.

Supplementation of glutamine, the most abundant amino acid within blood and muscle cells, also helps maintain a positive nitrogen balance in muscle tissue. Levels of glutamine within blood and muscle cells fall during strenuous exercise, and many researchers believe that glutamine may prevent some of the muscle breakdown that occurs during strenuous exercise. Glutamine also has a myriad of other benefits that may help increase muscle repair. Recent studies have shown that taking just 2 grams of l-glutamine can increase growth hormone levels by 400%. Glutamine can also help boost the immune system, cell volumization, and glycogen replenishment.

### **Antioxidants**

Thousands of reactions occur within the body as a result of intense physical training. The result of some of these reactions can be the formation of free radicals, destructive oxygen atoms. Exercise induced oxidative stress can be cured through proper PWO supplementation of antioxidants such as vitamin C and E. Vitamin C, a water-soluble vitamin, acts as a powerful anti-oxidant and seems to blunt the release of cortisol during high intensity or prolonged training. Vitamin E, a fat-soluble vitamin, acts similarly to vitamin C as a strong antioxidant. Consuming these antioxidants could reduce post-workout muscle tissue damage, speed recovery, and boost immune function.

### **Additional Recovery Aids**

Core-PWO also contains taurine to help aid in the recovery process. Taurine, a semi-essential amino acid, has been shown to have a cell-volumizing effect, which can boost hydration and help increase protein synthesis. Taurine also helps support proper nitric-oxide (NO) production and is also important to the body's metabolism of fats. Additionally, taurine has also been shown to have an antioxidant effect and can help boost the immune system.