

MyoZene: Where Science Meets the Gym

Contributed by Richard B. Kreider, PhD, FACSM, FISSN
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Over the last 20 years, the nutritional supplement industry has evolved from marketing of products with little scientific evidence supporting the use to the development of high quality functional products based on solid scientific evidence. MyoZene™ from Bioquest Pharmaceuticals is an example of a nutritional supplement that has been forged through years of scientific study that has identified specific nutrients that can optimize performance, recovery, and training adaptations. It's one of the best new supplements I have seen hit the market in years. Why am I so pumped about MyoZene?

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What's in MyoZene?

MyoZene is a scientifically-formulated post-exercise supplement that contains a number of highly effective anabolic/ergogenic nutrients. More specifically, MyoZene contains: 60 grams of a high glycemic carbohydrate (maltodextrin) that stimulates insulin secretion; 25 grams of ultra-high quality whey protein hydrolyzed into smaller pre-digested peptides that rapidly stimulate protein synthesis (i.e., anabolism); and, nutrients research has shown to increase protein synthesis and to decrease protein catabolism (leucine, glutamine), maintain a healthy immune system (Vitamin C, zinc, glutamine), help athletes recover and/or tolerate heavy training (maltodextrin, whey protein, L-carnitine L-tartrate, creatine, calcium-ketoisocaproic acid), and enhance performance and/or training adaptations (i.e., creatine). Frankly, it's the most scientifically sound nutritional supplement formulation that I have seen in a long time. It's no wonder that my colleagues like Dr. Joey Antonio and Dr. Jeff Stout feel this is one of the best supplements available for strength/power athletes and body builders.

The Science Behind MyoZene

There are a number of nutrients contained in MyoZene that can enhance recovery, training adaptations, and performance. The following describes why these nutrients are so important for athletes engaged in intense training who

want to increase strength, power, and muscle mass as well as tolerate heavy training demands to a better degree.

Maltodextrin. Most athletes know that carbohydrate is the primary fuel used for high-intensity intermittent or prolonged exercise [1]. When you lift weights, for example, you use phosphagens (adenosine triphosphate [ATP] and phosphocreatine [PCr]) as well as carbohydrate stored in the muscle as muscle glycogen to fuel high intensity exercise. Over time, your muscle glycogen levels deplete and your ability to perform high-intensity exercise declines [2, 3]. When you finish working out, it's important to replenish the carbohydrate used during exercise. Research has shown that the first few hours after intense exercise are the most important time to ingest carbohydrates and promote muscle growth [4-6]. The reason for this is that intense exercise stimulates release of hormones that promote anabolism. Ingestion of a high glycemic carbohydrate after exercise promotes a marked increase in insulin levels [7]. Insulin is an anabolic and anticatabolic hormone that serves to promote carbohydrate and amino acid storage into the muscle. Maltodextrin is a very high glycemic index carbohydrate that promotes large increases in blood glucose and insulin levels [8]. In my lab, for example, we have tested the effects of various types of carbohydrate consumed with whey protein on hormonal responses following resistance exercise. We have found that ingestion of maltodextrin markedly increases glucose and insulin levels and that maltodextrin is an optimal type of carbohydrate to ingest with whey protein following resistance exercise [9]. Therefore, maltodextrin is one of the best types of carbohydrates to consume after exercise in order to maximize carbohydrate replenishment as well as promote rapid uptake of amino acids in the muscle.

Whey Protein. Recent studies have shown that ingestion of carbohydrate and protein following exercise stimulates protein synthesis [10-14]. Initially, this was simply thought to be due to an insulin stimulating effect of adding protein to carbohydrate which in turn promotes amino acid storage into the muscle. However, researchers have since learned that the type of protein ingested has differential effects on protein synthesis and/or reducing catabolism [10, 15-20]. For example, research shows that since whey protein has the highest concentration of essential amino acids (EAA), it is digested quickly and therefore causes a sharp increase in amino acid availability into the blood which stimulates a rapid increase in protein synthesis [15, 18-21]. On the other hand, casein tends to clump in the stomach and is therefore digested at a slower rate [18-20]. The more prolonged release of amino acids in the blood after consuming casein serves to reduce protein degradation over time. In other words, casein has anti-catabolic effects on muscle degradation while whey protein has anabolic effects on protein synthesis. These findings indicate that if you want to rapidly increase protein synthesis, you should ingest whey protein.

Ok - you say - that's nothing new! Well, here's the exciting part. Myozene contains a high quality whey protein that has been hydrolyzed by enzymes to break up the large proteins into smaller tripeptide and dipeptide protein fragments. In other words, the whey protein in MyoZene comes in a "pre-digested" form. This process maintains the high quality amino acid profile of the whey protein while promoting fast absorption of the peptides and amino acids into muscle. In other words, MyoZene has taken whey protein to a whole new level in order to maximize amino acid delivery to the muscle. Ingestion of a high quality hydrolyzed whey protein like that found in MyoZene following exercise would be an excellent way to quickly deliver essential amino acids to the muscle in order to repair and build muscle tissue. Over time, this could lead to greater gains in strength and muscle mass. In support of this hypothesis, Boza and associates [22] reported that diets containing peptides were more effective than a diet containing free amino acids in the nutritional recovery of the starved rats. Additionally, Willoughby and colleagues [10] recently reported that ingesting 14 grams of whey and casein with 6 grams of free amino acids resulted in greater increases in body mass, fat-free mass, thigh mass, muscle strength, serum insulin-growth factor-1, muscle fiber protein content, and markers of protein synthesis compared to a carbohydrate placebo.

Leucine. Research evaluating the role of protein and amino acid supplementation on protein synthesis has indicated that about 20 grams of whey protein is effective in promoting protein synthesis. The reason for this is that whey protein has a high proportion of EAA. Research has also shown that ingestion of as little as 3-6 grams of EAA prior to or following resistance-exercise can significantly increase protein synthesis [11-13, 23-31]. Additionally, that leucine appears to be the primary stimulant of protein synthesis [32-37]. Consequently, ingesting a supplement with leucine and whey protein would be an optimal way to stimulate protein synthesis prior to and/or following exercise leading to better training adaptations. There are several studies supporting this concept. For example, Koopman and coworkers [37] reported that co-ingestion of hydrolyzed protein and leucine stimulates muscle protein synthesis and optimizes whole body protein balance compared to ingestion of carbohydrate alone. This research group also reported that co-ingestion of leucine with

hydrolyzed protein stimulated protein synthesis in both younger and older subjects [36]. Rieu et al. [32] similarly concluded that adding leucine to a balanced meals improved muscle protein synthesis in the elderly independently of an overall increase of other amino acids. Layman and colleagues [38-40] have also suggested that leucine supplementation may be important for weight loss and/or management due to its ability to manage glucose levels. Finally, Crowe and associates [33] reported that six weeks of dietary leucine supplementation (45 mg/kg/d) significantly improved endurance performance and upper body power in canoeists. These studies and others provide strong rationale as to the potential value of ingesting leucine with carbohydrate and protein prior to and/or following intense exercise.

Glutamine. Myozene also contains L-glutamine. Glutamine is the most plentiful non-essential amino acid in the body and plays a number of important physiological roles [41]. Glutamine has been reported to be an important regulator of cell volume and stimulate protein [42, 43] and glycogen synthesis [44-46]. Theoretically, glutamine supplementation prior to and/or following exercise (e.g., 6-10 g) may help to optimize cell hydration and protein synthesis during training leading to greater gains in muscle mass and strength. In support of this hypothesis, Colker and associates [47] reported that subjects who supplemented their diet with glutamine (5 grams/day) and BCAA (3 grams/day) enriched whey protein during training promoted about a 2 lbs greater gain in muscle mass and greater gains in strength than ingesting whey protein alone. These findings provide preliminary evidence to indicate that glutamine supplementation during training may help build muscle.

However, there is another important reason for athletes engage in intense training to consider adding glutamine to their training table. Glutamine serves as the primary fuel for white blood cells (i.e., lymphocytes) that help the body fight off infections [41, 48]. We know that intense exercise suppresses the immune system particularly during the first few hours after a hard workout. This exercise-induced immunosuppression has been related to increases in the susceptibility to upper respiratory tract infections (URTI) [48-50]. Studies have found that intense exercise decreases blood glutamine levels and may be related to the incidence of overtraining. Consequently, glutamine supplementation has been suggested to be a possible nutritional means of maintaining a healthy immune system during intense training [41, 50-52]. In support of this theory, Castell and coworkers [53] reported that glutamine supplementation can help reduce the incidence of URTI in runners after a marathon. MyoZene also contains vitamin C and Zinc that have also been reported to help lessen the immunosuppressive effects of intense exercise [48, 50, 52, 54-56]. Consequently, the availability of glutamine, vitamin C, and Zinc in MyoZene may offer immuno-protective effects for athletes engaged in intense exercise.

α-Ketoisocaproate (KIC). KIC is a branched chain keto acid (BCKA) that is a metabolite of leucine metabolism. Metabolites of leucine are believed to possess anticatabolic properties [57, 58]. There is some clinical evidence that KIC may spare protein degradation in clinical populations [57, 58]. Theoretically, KIC may help minimize protein degradation during intense training possibly leading to greater training adaptations.

Taurine. Taurine is the second most abundant amino in muscle next to glutamine. Taurine has primarily been reported to have two important roles that may be of benefit for athletes. First, taurine has been reported to affect cell hydration status [59, 60]. As mentioned before, maintenance of cell hydration has been reported to be an important regulator of protein synthesis. Second, taurine serves as an antioxidant and may therefore help reduce exercise-induced oxidative stress [61-63]. For example, Zhang and associates [64] reported that taurine supplementation may attenuate exercise-induced DNA damage and enhance the capacity of exercise due to its cellular protective properties. Other studies have suggested that taurine produces a beneficial effect on lipid metabolism and may have an important role in cardiovascular disease prevention in overweight or obese subjects [65].

L-Carnitine L-Tartrate (LCLT). LCLT is a form of L-carnitine. L-carnitine is most known to be an important nutrient involved in the shuttling of fatty acids from the cytosol into the mitochondria for oxidation. For this reason, L-carnitine supplementation has been primarily marketed as a potential weight loss supplement [66]. However, recent evidence indicates that LCLT may also help athletes tolerate intensified training. For example, Giamberardino and associates [67] reported that 3-weeks of L-carnitine supplementation (3 grams/day) significantly reduced pain, tenderness and creatine kinase release (a marker of muscle damage) after eccentric exercise. More recently, Volek et al. [68] reported that LCLT

supplementation (2 grams/day for 3-weeks) enhanced recovery from an intensified period of squat exercise. In this regard, LCLT supplementation resulted in less accumulation of markers of oxidative stress as well as lessened tissue damage and perceptions of muscle soreness. There was also evidence of a reduction in muscle trauma from magnetic resonance imaging (MRI) scans [69]. In a subsequent study, these researchers reported that LCLT supplementation up-regulated androgen receptor content which may be helpful in promoting recovery [70]. These findings suggest that LCLT may help athletes tolerate and/or recover from heavy training periods.

Vitamins and Minerals. MyoZene also contains Vitamin C (250mg), Vitamin E (400 IU of d-alpha tocopherol), Thiamin (3 mg of thiamin HCl), Riboflavin (3.4 mg), Niacin (20 mg of niacinamide), Vitamin B6 (4 mg of pyridoxine HCl), Vitamin B12 (6 mcg of cyanocobalamin), Biotin (300 mcg), Pantothenic acid (10 mg), Calcium (130 mg), Phosphorus (100 mg), Magnesium (300 mg of magnesium oxide), Zinc (10 mg of zinc oxide), Chromium as picolinate (50 mcg), Sodium chloride (295 mg), and Potassium (500 mg of potassium citrate). Consequently, one serving per day of MyoZene serves as a high potency one-a-day multivitamin.

Creatine. Alright, if you're not convinced yet, MyoZene also contains the mother of all dietary supplements for resistance trained athletes - ultra-pure creatine from Germany. In my view, creatine is the most effective nutritional supplement available to athletes to increase high intensity exercise capacity and muscle mass during training.... period. Numerous studies have indicated that creatine supplementation increases body mass and/or muscle mass during training [71, 72]. Gains are typically 2 - 5 pounds greater than controls during 4 - 12 weeks of training. The gains in muscle mass appear to be a result of an improved ability to perform high intensity exercise enabling an athlete to train harder and thereby promote greater training adaptations and muscle hypertrophy. The only clinically significant side effect reported from creatine supplementation has been weight gain. Consequently, creatine has proven to be one of the most effective and safest ergogenic aids available for strength athletes. Topping off MyoZene with pure German creatine makes this one of the most impressive nutritional supplements I have ever evaluated.

Bottom Line

MyoZene is a scientifically-formulated post-exercise supplement that contains a number of nutrients that cutting edge research has shown can help optimize performance, enhance recovery from intense training, and maximize training adaptations. Adding MyoZene to your training program will no doubt lead to greater gains in strength, muscle mass, and performance. It's the real deal!

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