L-GLUTAMINE ISN'T ONLY FOR ATHLETES

L-Glutamine is essential for maintaining intestinal function and aiding in the immune response as well. After glutamine is synthesized in skeletal muscle it is released into the bloodstream and transported to the kidney, liver and small intestine and cells of the immune system where it plays another vital role. Glutamine is used by white blood cells and contributes to normal immune-system function. Individuals with muscle-wasting and immune-system related illnesses (such as cancer or AIDS) who may be incapable of manufacturing their own supply of glutamine may benefit from glutamine supplements taken along with other amino acids. In addition, glutamine is used to make the body's primary cellular antioxidant Glutathione. Glutathione is an important molecule which exists in almost every cell of the body. The presence of glutathione is required to maintain the normal function of the immune system. Lack of glutathione has been shown to contribute to a variety of health conditions and immune disorders.

CONCLUSION

The purpose of sports supplementation is to help improve athletic performance which includes enhancing the ability to recover so you can train harder. The harder you train though the greater the risk of Over Training Syndrome (OTS). To help prevent or alleviate OTS, science has proven that nothing may be more powerful than glutamine in accomplishing this. It is extremely versatile and can enhance muscle growth, speed recovery, boost immune function, stimulate energy replenishment and much more.

REFERENCES

1. Welbourne, T.C. "Increased plasma bicarbonate and growth hormone after an oral glutamine load," Am J Clin Nutr, 61: 1058-61, 1995.

John Scott's NITRO®
Building A New Breed Of Champion

L-GLUTAMINE
Micronized

Micronized L-Glutamine by John Scott's Nitro contains pure pharmaceutical grade, crystalline L-Glutamine which has been micronized for increased surface area so the body can absorb it faster and more efficiently. L-Glutamine supplementation has been shown in countless research to be an extremely effective way for both men and women to increase their body's recovery time, boost their immune system and help prevent over-training (a potentially dangerous, muscle wasting condition). L-Glutamine is a conditionally essential amino acid for athletes because physical activity depletes your body's supply of it. Therefore, proper supplementation with L-Glutamine will help maintain higher muscle nitrogen levels and boost immune function via greater Glutathione levels (your body's main anti-oxidant). This can result in significantly greater workout intensity levels, increased athletic performance and recovery.

Supplement Facts

Serving Size: 1 heaping teaspoon (5g)
Servings per container: 100

	Amount / Serving	%DV
Micronized L-Glutamine	5g	*

* Daily Value Not Established

Suggested Use: Mix one serving into juice or water 30 minutes prior to and an additional serving immediately after physical activity. To maximize your body's recovery, you can take an additional serving before bed in juice or water.
Consult your physician before starting any exercise program.

Stacking Option: For a synergistic gain in cellular volume, muscle growth, power and recovery, stack with **Micronized Creatine** or **Cell Drive**.

These statements have not been evaluated by the FDA. The product is not intended to treat, cure or prevent disease.

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*by **John Scott, CISSN, CNS, SPN***
Developer of John Scott's Nitro

"I understand what an athlete needs because I am one."

A CRITICAL LINK IN MUSCLE METABOLISM AND RECOVERY

An athlete's ability to recuperate is the greatest limiting factor in one's training. Like most serious athletes, I tend to push too hard and train more often than I have the ability to fully recover from. As a result of this "no pain, no gain" philosophy, we should always be watching for signs of overtraining in our quest for athletic perfection. L-Glutamine is one of the most critical components of an athlete's recovery and one of the most versatile and powerful amino acids providing a tri-powered benefit. It maximizes protein synthesis, acts as an anti-catabolic (stops muscle loss) and fuels immune function.

WHY IS SUPPLEMENTING WITH GLUTAMINE IMPORTANT FOR GROWTH AND RECOVERY?

Intensive exercise disrupts immune function, increases detrimental lactic acid and ammonia levels. Almost immediately when one exercises the body starts to release glutamine from the muscles back into the blood and catabolic hormones are released. Even after one finishes exercising, the muscles continue to release glutamine causing a severe depletion which leads to dehydration too. Glutamine acts as a cell volumizer increasing the hydration state of the muscle cells. Hydration of the muscle cells can change rapidly, and once the cells are dehydrated they enter a catabolic state leading to overtraining. Overtraining results in less gains, increased disease rates as well as a higher chance of infections due to a weakening immune system. Research has confirmed that low plasma glutamine is an indicator of over-training. It has also demonstrated the dramatic effect intense exercise and stress has on the body's glutamine reserves. Normally L-glutamine is considered a non-essential amino acid because it is manufactured in the body by combining glutamic acid and ammonia, a waste product of metabolic activity. However, studies have shown that during strenuous exercise or heavy stress, the need for glutamine can increase beyond the body's ability to synthesize it, making it "conditionally essential". For example, athletes doing intensive anaerobic exercise showed a 45% drop in plasma glutamine compared to pre-exercise levels. When the same athletes continued aerobic exercise for 10 days, their plasma glutamine dropped by 50%. Some people had depressed glutamine levels as long as six days after exercise. Studies also show that athletes who overtrain can be at increased risk for infection. Therefore, L-Glutamine supplementation should be a staple of every athlete's nutrition due to its ability to dramatically improve recovery, enhance immune function and boost muscle growth.

BENEFITS

- Improved protein synthesis
- Protects against muscle loss – helps prevent muscle from being catabolized (torn apart) in order to provide glutamine to other cells in the body.
- Helps maintain cell volume and hydration, speeding wound healing and recovery.
- Helps boost growth hormone levels.
- Boost immune function - this is important since intense training can greatly deplete Glutamine levels. Glutamine is a primary energy source for your immune system.
- Enhances intestinal health - has the ability to help maintain the structural integrity of the bowels.
- Helps restore glycogen & cellular energy levels.
- Boosts brain function - improves mental alertness, clarity of thinking and mood.
- Enhances joint health - the amid group of L-Glutamine contributes to the biosynthesis of glucosamine which helps protect joints from degradation and injury.
- Increased Growth Hormone output
- Scavenges lactic acid and detoxifies ammonia from muscle tissue allowing for harder, longer workouts with less muscle soreness.

WHAT IS L-GLUTAMINE?

Micronized L-Glutamine™ is a tasteless, odorless powder that is micronized for greater absorption. It can easily be mixed into juice or your favorite beverage. I add it to my **XP™** Advanced Myogenic Protein drink after training. Glutamine is the most abundant amino acid in the human body. Over 61% of skeletal muscle is Glutamine. It is the most important amino acid because it plays an important role in strengthening the immune system, transporting nitrogen and supporting protein synthesis. A positive cellular nitrogen balance is crucial for lean muscle growth. Glutamine's unique structure, containing two nitrogen side chains, consists of 19% nitrogen, making it the primary transporter of nitrogen into the muscle cell. In fact, glutamine is responsible for 35% of the nitrogen that gets transported into the muscle cell. Glutamine literally drives muscle building nitrogen into the muscle cell where it is synthesized for growth. This is why the loss of glutamine from training causes a resulting loss of nitrogen from muscle tissue. This double loss is extremely catabolic. Supplementing with glutamine spares free glutamine in muscle tissue, counteracting the drop in muscle protein synthesis and improving nitrogen balance. This helps to alleviate "Over-Training Syndrome (OTS)" and the "Training Paradox." You want to train hard to improve performance but the harder you train the more likely you are to overtrain. Therefore, the higher the muscle glutamine levels you can maintain, the less chance you have of falling into catabolism and the faster muscle will grow.

In addition, L-glutamine supplementation has also been shown to increase one of the body's most important and anabolic hormones, growth hormone (GH). GH regulates several metabolic functions including protein synthesis, increasing fat utilization for energy and improving glycogen replenishment. In a recent release of the prestigious American Journal of Clinical Nutrition, the results of a study on glutamine revealed that a single 2 gram oral dose of glutamine elevated GH levels by over 430%![1] While glutamine works well by itself to boost recovery and GH, I created **Cell Drive™** to be the ideal stack (which includes L-glutamine) of vital nutrients your body needs for superior recovery. For even better results, use **Cell Drive™** in conjunction with **GH™**. These two products take advantage of your two natural pulses of GH. **Cell Drive™** helps boost your post-workout pulse while **GH™** helps boost your nighttime pulse.

Glutamine may also improve brain function. It is used by the central nervous system to make neurotransmitters and has been found to act as a substrate of gluconeogenesis (the production of glucose from other substrates such as amino acids, glycerol and lactic acid).[5] This is important because it acts as fuel for the muscles and brain, possibly improving cognitive function. A 2002 study showed that glycogen resynthesis rates were higher after ingestion of a drink containing glutamine.[6] Another study found that glutamine promoted whole body carbohydrate storage and muscle glycogen resynthesis during recovery from exhaustive exercise. As a result, glutamine supplementation may boost the perception of energy and/or help to prevent mental fatigue.