L-GLUTAMINE POWDER

Free-form unflavored amino acid powder

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WHAT IS L-GLUTAMINE?

Designs for Sport® L-Glutamine powder provides 3 g per serving of the amino acid L-glutamine. Glutamine is the body's most abundant amino acid and is required for protein synthesis, muscle growth, and energy production.[1] It also plays an anabolic role in the body, fueling intestinal and immune cells, helps to manage nitrogen balance, and is a precursor for neurotransmitters and glutathione.[1] Glutamine is a dynamic amino acid with an impressive range of benefits, from supporting gastrointestinal health to supporting skeletal muscles, which may give athletes that extra edge.* L-glutamine powder is an easy-to-drink, tasteless powder that athletes can mix into a beverage of choice either at home or on the go.

FORMULA HIGHLIGHTS

- 3 g of L-Glutamine per serving
- Free-form amino acid
- Gluten-free, dairy-free, soy-free; non-GMO
- NSF Certified for Sport®

SUPPORTS MUSCLE STRENGTH AND RECOVERY*

Glutamine is a critical amino acid for muscles, as nearly 80% of total body glutamine is found in skeletal muscle.[2] For athletes seeking extra protein support, glutamine supplementation may be beneficial for helping to maintain muscle mass, support strength, and promote recovery.[3–5] One double-blind, randomized study evaluated the effects of 30 days of L-glutamine supplementation (10 g/day) on muscle strength in 44 women aged 60 to 80. The researchers found that those who supplemented with L-glutamine experienced significant benefits, including improved knee extensor and flexor muscle strength, along with better glycemic control and improved glutathione status, compared to the placebo group.[3] Another double-blind, randomized, cross-over study researched the effects of L-glutamine supplementation on 16 men and women in their 20s. They performed high-intensity eccentric knee extensor exercises, followed by 0.3 g/kg/day of glutamine or a placebo. Findings showed that the group taking L-glutamine experienced higher peak torque strength immediately and 72 hours post-exercise compared to the placebo.[4] In addition, they experienced less muscle soreness at 24, 48, and 72 hours after exercising compared to the placebo.[4]

Prolonged exercise lowers glutamine status in the body and may impact the mucosal layer in the gastrointestinal tract, adversely impacting the immune system.[6] Glutamine supplementation has been shown to promote the production of immunoglobulin A (IgA) antibodies and maintain healthy inflammatory cytokine balance in athletes with damaged mucosal immunity caused by strenuous exercise.[7] Glutamine helps the body store more glycogen (the energy reserve in muscles and liver to fuel exercise) and supports growth hormone secretion, which helps promote muscle growth and support overall health.[1] A randomized, double-blind, placebo-controlled human crossover study showed glutamine supplementation to mitigate muscle soreness and speed up recovery following eccentric exercise.[4] Supplementing before and after exercise may help attain maximum results and replete lost stores of glutamine.*

SUPPORTS DIGESTIVE HEALTH

Gastrointestinal health is a focal point for many athletes, especially endurance and long-distance athletes, as they are susceptible to digestive upset, possibly due to intestinal permeability.[6,8] Glutamine is considered "the intestinal permeability factor" because of its ability to maintain the integrity of the intestinal wall.[8,9] If the intestinal lining becomes permeable or "leaky," large food molecules enter the bloodstream, which can be associated with disrupted immune function, unbalanced mood, or occasional GI complaints.[8] One systematic

review looked at 125 athletes and found that intestinal permeability increased (worsened) proportionally to the magnitude of exercise, and more so with exercises that substantially increased body temperature, such as marathon running.[10]

Intestinal cells utilize approximately 30% of total glutamine in the body, competing with other tissues with utilization.[9] Glutamine may help restore the intestinal barrier and support the health of the digestive tract of athletes.[8,11] A small double-blind, placebo-controlled trial investigated the effects of L-glutamine supplementation (0.25 g/kg, 0.5 g/kg, or 0.9 g/kg) or a placebo on the intestinal permeability of ten runners in a hot environment. They found that both groups supplementing glutamine experienced significant reductions in biomarkers associated with intestinal permeability compared to the placebo group; however, the higher amount was more effective.[8]

SUPPORTS THE IMMUNE SYSTEM*

Glutamine serves as the preferred energy source for the immune system and its varied cells.[12] Intense and prolonged exercise is associated with decreases in the amount of glutamine produced by muscle cells, the primary site of glutamine production, which may be a major contributor to the impairments in immune responses experienced by endurance athletes.[1,12] Supplemental glutamine may help mitigate these adverse effects and support immune function.[1,7,13] A three-week double-blind crossover study explored the impact of supplemental L-glutamine on mucosal immune function in 21 combat-sport athletes. Salivary samples at the end of the study showed significant improvements in immune markers when the participants supplemented L-glutamine, such as IgA and nitric oxide, and a better testosterone-to-cortisol ratio compared to the placebo group.[13]

BENEFITS*:

- May support muscle strength and recovery[3–5]
- May support immune function[1,7,13]
- May support healthy intestinal permeability[6,8,11]

HOW TO TAKE

Take 3 grams (approx. one scoop) with liquid per day. L-glutamine can be taken in water, juice, or mixed into protein powder shakes.

Supplement Facts

Serving Size 3 grams (approx. one scoop)
Servings Per Container 166

Amount Per Serving	% Daily Value
L-Glutamine 3 g	*

*Daily Value not established.

3 GRAMS OF L-GLUTAMINE PER SERVING

SUPPORTS MUSCLE TISSUE MAINTENANCE*

PROMOTES HEALTHY DIGESTION & IMMUNE RESPONSE*

NSF CERTIFIED SPORT

SOY-FREE · GLUTEN-FREE · DAIRY-FREE · 0 GRAMS SUGAR · NON-GMO · HIGHLY ABSORBABLE*

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

LGL500-DS

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