L-Glutamine

Free-form unflavored amino acid powder

Glutamine is the body's most abundant free amino acid, representing approximately 40-60% of the total amino acid pool in tissues.[1]

SPORTS APPLICATIONS

Prolonged exercise lowers glutamine levels in the body, and has been shown to decrease mucosal immunity. Glutamine supplementation has been shown to promote the production of IgA antibodies and maintain pro- and anti-inflammatory cytokine balance in athletes with damaged mucosal immunity caused by strenuous exercise.[5] Glutamine helps the body store more glycogen (the energy reserve in muscles and liver to fuel exercise) and enhances growth hormone secretion, which increases muscle growth and improves overall health.[1] A randomized, double-blind placebo-controlled human crossover study showed glutamine supplementation to diminish muscle soreness and speed up recovery following eccentric exercise.[6] Supplementing before and after exercise may help attain maximum results and replete lost stores

DIGESTIVE HEALTH

Intestinal cells utilize approximately 30% of total glutamine in the body, competing with other tissues for utilization.[7] Glutamine promotes proliferation of enterocytes, helps regulate tight junction proteins, suppresses pro-inflammatory cytokine expression and signaling pathways, and protects against cellular stress and apoptosis.[7] It is considered "the intestinal permeability factor" because of its ability to maintain the integrity of the intestinal wall.[7,8] If the intestinal lining becomes permeable or "leaky," large food molecules enter the bloodstream, which can lead to a host of conditions such as disrupted immune function, autoimmune diseases, food allergies, and even mood disorders.[8] Glutamine stores are depleted during severe metabolic stress including inflammatory bowel diseases such as Crohn's disease (CD), and in clinical studies supplementation has been shown to protect the intestinal mucosa and reduce colonic inflammatory cytokine production.[7]

BODY COMPOSITION / MANAGING CRAVINGS

A pilot study of obese humans found that 14 days of glutamine (30 g) treatment significantly altered gut microbiota, reducing Firmicutes to Bacteroidetes ratio.[9] Obese individuals tend to have higer levels of Firmicutes relative to Bacteroidetes levels, optimizing this ratio is helping in improving body composition. Glutamine can help to control appetite and regulate blood sugar. For those removing refined sugar from their diet, glutamine can be used as an adjunct to reduce sugar cravings. When 12 grams (four teaspoons) was given to alcoholics, glutamine eliminated alcohol cravings in 75% of those studied.[23]

IMMUNE SUPPORT

As mentioned previously, glutamine is a preferred energy source for the immune system and its varied cells.[4] Viral infections such as the common cold and influenza dramatically lower glutamine levels, making supplementation essential in the midst of and after infection. A deficiency of glutamine has been shown to impair immune function by reducing protective T-lymphocyte proliferation (which requires increased glucose and glutamine) and dampening the expression of surface activation proteins on cytokines,[4] as well as reducing the ability of macrophages to kill viruses and bacteria.[10] For these reasons, this vital amino acid may help combat colds, the flu, and other immune weaknesses, especially if patients are unable to eat well.*

WOUND HEALING

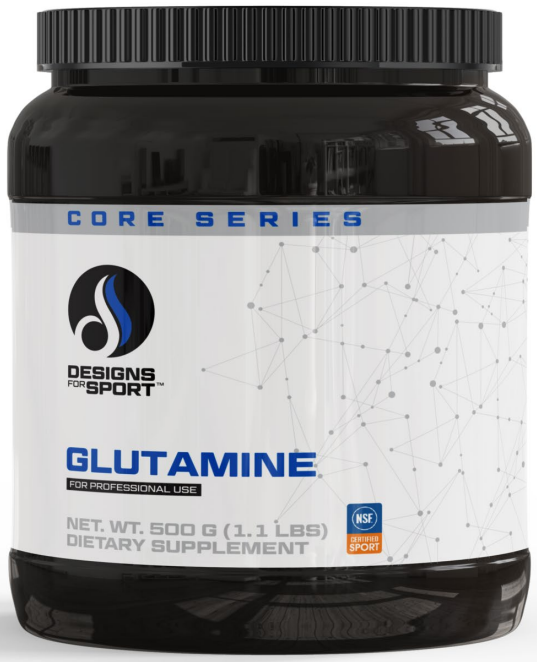
Production of glutamine is decreased during periods of physical stress, trauma, or injury. Glutamine supplementation may be beneficial in these situations, as it has been shown to help speed wound healing and recovery in burn and trauma victims.[11,12] Glutamine has also been shown in research to improve hospital outcomes and shorten hospital stay in post-surgical patients.[13]

USES:

- Support Management of Cravings
- Augment Athletic Performance and Recovery
- Fuel Immune Cells
- Support GI Health
- Promote Wound Healing

CONSIDERATIONS:

- Can be combined with a protein powder, Designs for Sport Hydration Complex or Amino Acid Complex as a part of a recovery drink or Designs for Sport GI Support Complex to enhance gut health.



Supplement Facts

Serving Size 3 grams (approx. ¾ teaspoon)
Servings Per Container 166

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

* Daily Value not established.

GLUTEN FREE FORMULA · DAIRY FREE FORMULA · SOY FREE FORMULA · VEGETARIAN FORMULA · NON GMO INGREDIENTS

HOW TO TAKE:

As a dietary supplement, take 3 grams (approx. 1 scoop) per day, or as directed by your health care practitioner. L-Glutamine can be taken in water, juice, or mixed into shakes.

CONTRAINDICATIONS

Use caution in cases of liver or kidney disease or failure.

REFERENCES

1. Cruzat, V., Macedo Rogero, M., Noel Keane, K., Curi, R., & Newsholme, P. (2018). Glutamine: Metabolism and immune function, supplementation and clinical translation. Nutrients, 10(11), 1564. DOI:10.3390/nu10111564
4. Keast D, Arstein D, Harper W, Fry RW, Morton AR. Depression of plasma glutamine concentration after exercise stress and its possible influence on the immune system. Med J Aus1995;162(1):15-8.
5. Varnier M, Leese GP, Thompson J, Rennie MJ. Stimulatory effect of glutamine on glycogen accumulation in human skeletal muscle. Am J Physiol 1995;269(2 Pt 1):E309-15.
6. Welbourne TC. Increased plasma bicarbonate and growth hormone after an oral glutamine load. Am J Clin Nutr 1995;61(5):1058-61.
7. van der Hulst RR, van Kreel BK, von Meyenfeldt MF, et al. Glutamine and the preservation of gut integrity [see comments]. Lancet 1993;341(8857):1363-5.
8. Pugh, J. N., Sage, S., Hutson, M., Doran, D. A., Fleming, S. C., Highton, J., ... Close, G. L. (2017). Glutamine supplementation reduces markers of intestinal permeability during running in the heat in a dose-dependent manner. European Journal of Applied Physiology, 117(12), 2569–2577. DOI:10.1007/s00421-017-3744-4
9. Peck. Glutamine Should Be Figured Into Inflammatory Bowel Disease Formulations. Family Practice News 1994(June 1, 1994):22
10. Wang, K., Hoshino, Y., Dowdell, K., Bosch-Marce, M., Myers, T. G., Sarmiento, M., ... Cohen, J. I. (2017). Glutamine supplementation suppresses herpes simplex virus reactivation. The Journal of Clinical Investigation, 127(7), 2626–2630. DOI:10.1172/JCI88990
11. Shu, X. L., Yu, T. T., Kang, K., & Zhao, J. (2016). Effects of glutamine on markers of intestinal inflammatory response and mucosal permeability in abdominal surgery patients: A meta-analysis. Experimental and Therapeutic Medicine, 12(6), 3499–3506. DOI:10.3892/etm.2016.3799
12. Reena, V. T., Gopichandran, L., Sumit, S., & Muthuvenkatachalam, S. (2016). Comparison of glutamine enriched feed over normal routine feed in traumatic brain injury patients: A randomized double-blind controlled trial. Asain Journal of Nursing Education and Research, 6(4), 485-490. DOI: 10.5958/2349-2996.2016.00091.4
13. Al Balushi, R. M., Paratz, J. D., Cohen, J., & Banks, M. (2016). Glutamine supplementation in multiple trauma of critical care. In: Rajendram, R., Preedy V.R., & Patel V.B. (Eds.), Diet and Nutrition in Critical Care (203-218). New York, NY: Springer. https://doi.org/10.1007/978-1-4614-7836-2_141
23. Rogers P. Review of Nutrition. Journal Stud. Alcohol 1957;18(4):581-587