INTEGRATIVE
GASTROINTESTINAL™

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GLUTAMINE FORTÉ

L-GLUTAMINE WITH BIOAVAILABLE THERACURMIN®

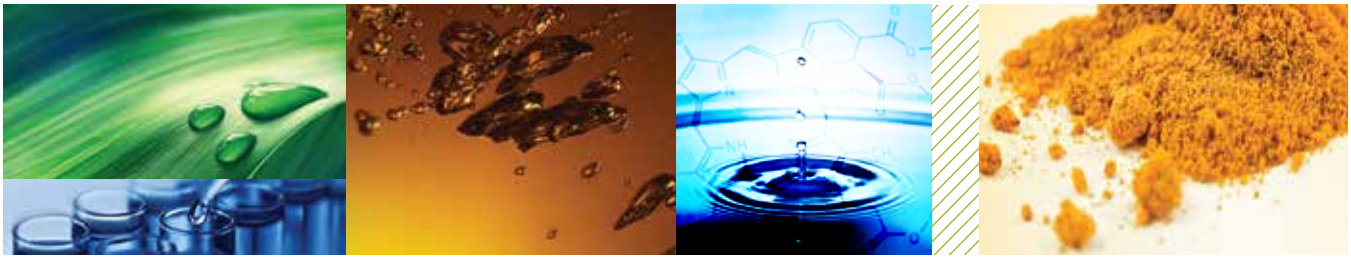
Glutamine Forté delivers a therapeutic level of L-Glutamine (5,000 mg (5 g) per serving) in combination with Theracurmin®, a novel, water-dispersible form of turmeric with dramatically enhanced curcumin bioavailability. Theracurmin is over 27 times more bioavailable than standard curcumin. It complements the actions of glutamine by providing optimal support of the body's antioxidant pathways and cytokine response.* L-Glutamine is a conditionally essential amino acid and an important fuel for enterocytes. The benefits of oral supplementation have been extensively studied. L-Glutamine has been shown to:

- Restore gut barrier function*
- Promote healthy intestinal permeability*
- Support a healthy immune system*
- Support healthy tissue repair mechanisms*

A Great-Tasting, Hypoallergenic Drink Mix

Because daily recommendations for L-Glutamine can reach up to 30 grams daily in certain conditions, Glutamine Forté is formulated with a great-tasting, mild citrus flavor. Its convenient powdered drink mix format allows for flexible dosing and customized patient care. The product can be mixed in cold water or juice, or even in foods, such as yogurt or applesauce, for improved compliance.

wheat free · gluten free · soy free · dairy free · vegetarian



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GLUTAMINE FORTÉ

Background

Maintenance of intestinal permeability has global effects throughout the body, with impact on the immune system, the cardiovascular system, the regulation of cytokine and chemotactic mediators, as well as local intestinal functions. Supporting gut integrity may therefore have wide-ranging health benefits. Both glutamine and curcumin have been shown to support the body's antioxidation pathways and modulate other cellular processes that influence intestinal cell health and cellular tight junctions.*

Glutamine in Intestinal Physiology

Glutamine is the most abundant amino acid in the human body. It is a conditionally essential amino acid, meaning that it is required in increased amounts under certain conditions, e.g., metabolic stress, to support healthy intestinal function.* In many cell types, including enterocytes, glutamine acts as a primary fuel for mitochondria and is essential to the maintenance of mitochondrial membrane[1] and optimal intestinal motility.*[2]

Experimental studies suggest that glutamine supports a healthy cytokine and chemotactic response in colonic cells[3–6] and is vital to basic intestinal cellular integrity and function.*[7] Under times of stress, the body's need for glutamine increases.8 Glutamine is a precursor to glutathione, the most important intracellular antioxidant.[9]

Glutamine has been shown to support healthy enterocyte synthesis, proliferation, and integrity.*[10, 11] It exerts influence over numerous signaling pathways governing healthy cell growth.*[12] Animal studies suggest that oral glutamine supplementation increases quantities of desirable mucosal proteins and ileocecal immunoglobulins and supports mucosal microvilli height, and controls passage of macromolecules, suggesting support of enterocyte and gap-junction integrity.*[13] Glutamine supports optimal structural integrity of the enterocytes and their barriers,[21] controlling passage of luminal molecules into the systemic circulation, and maintaining healthy intestinal permeability.*[14,15]

Clinical Use of Glutamine

Increased intestinal permeability occurs in many patient populations and glutamine supplementation has been shown to support healthy blood and tissue levels of glutamine and to optimize intestinal and digestive health function in diverse groups of patients.*[16-21] Glutamine supplementation has also been shown to support healthy intestinal permeability related to changes in liver function.*[22] It stimulates glucagon-like peptide, and helps maintain optimal glucose metabolism.*[24,25]

In one study of 33 subjects with body mass indices between 25 and 47 kg/m2 were randomized to receive glutamine (or placebo) for 14 days. The glutamine group experienced reductions in the Firmicutes to Bacteroidetes ratio suggesting an influence of oral glutamine supplementation on the microbiome.[26]

Theracurmin®

Many studies have suggested beneficial effects of curcumin in supporting health of intestinal cells, particularly in the colon.*[27-29] Curcumin significantly improves survival and colonic morphology, dampens local cytokine and chemokine production, and reduces mucosal neutrophil infiltration.*[30] However, to work optimally curcumin needs to act both systemically and locally. Standard curcumin is poorly absorbed and has limited water solubility.[31,32] Theracurmin is a novel turmeric preparation with dramatically enhanced absorption and bioavailability. Finely milled turmeric is made into a colloid with a vegetable gum called gum ghatti, which mainly consists of polysaccharides obtained from the sap of ghatti trees (*Anogeissus latifolia*). Composed of ingredients, Theracurmin is very stable against light and heat, has unmatched dispersion and stability in water, is 27 times more bioavailable in humans than standard curcumin.[33,34,35]

How to Use

Supplementation of glutamine at doses substantially above ordinary daily requirements may support health of the enterocytes in many clinical scenarios.*[36-38] Each serving provides 5 grams of glutamine and can be taken 3 to 6 times per day. Oral glutamine is considered safe at amounts up to 50 grams daily.[39] Glutamine Forté is formulated to deliver high-dose glutamine combined with bioavailable Theracurmin for intensive support of the intestinal epithelium.*

Supplement Facts

Serving Size 1 level scoop (6.7 g)		Servings per container 30
Amount per level scoop		**%DV**
Calories	20	
Protein	5 g	**10%†**
L-Glutamine	5 g	**
Theracurmin® (water-dispersible turmeric (*Curcuma longa*) rhizome)	100 mg	**

†Percent Daily Values (DV) are based on a 2,000 calorie diet.
**Daily Value not established.

Recommendations: Take 1 level scoop mixed in 8 oz. water or juice, 1-3 times daily, or as recommended by your healthcare professional.

Other Ingredients: Xylitol, citric acid, lemon lime flavor with other natural flavors, luo han guo, silicon dioxide, maltose, malic acid, gum ghatti, and dextrin.

Contains No: sugar, salt, yeast, wheat, gluten, soy, dairy products, artificial coloring, artificial flavoring, preservatives, or ingredients of animal origin.

Caution: If pregnant, nursing, taking prescription drugs, or if you have active liver disease, consult with your healthcare professional prior to use. Glutamine is not recommended for individuals with Crohn's disease.

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References

1. Wise DR, Thompson CB. *Trends Biochem Sci.* 2010 Aug;35(8):427–33.
2. Mochiki E, Ohno T, Yanai M, et al. *World J Surg.* 2011 Apr;35(4):805–10.
3. Xue H, Sufit AJ, Wischmeyer PE *JPEN J Parenter Enteral Nutr.* 2011 Mar;35(2):188–97.
4. Hayden LJ, Thomas G, West GB. Inhibitors of gastric lesions in the rat. *J Pharm Pharmacol.* 1978 Apr;30(4):244–6.
5. Mitra R, Pal SP. I*ndian J Physiol Pharmacol.* 1977 Oct-Dec;21(4):374–8.
6. Li JM, Jia HY, Wang JJ, Yu Q, Li S. *ZhongguoYing Yong Sheng Li Xue Za Zhi.* 2009 May;25(2):268–72.
7. Soeters PB, Grecu I. *Ann Nutr Metab.* 2012;60(1):17–26.
8. Briassouli E, Briassoulis G. *Clin Dev Immunol.* 2012;2012:749189.
9. Blachier F, Boutry C, Bos C, Tomé D. *Am J Clin Nutr.* 2009 Sep;90(3):814S–821S.
10. Dos Santos RG, Viana ML, Generoso SV, et al. *JPEN J Parenter Enteral Nutr.* 2010 Jul-Aug;34(4):408–13.
11. Kuhn KS, Muscaritoli M, Wischmeyer P, Stehle P. *Eur J Nutr.* 2010 Jun;49(4):197–210. Epub 2009 Nov 21.
12. DeBerardinis RJ, Cheng T. *Oncogene.* 2010 Jan 21;29(3):313–24.
13. Jiang JW, Ren ZG, Chen L, et al. *Hepatobiliary Pancreat Dis Int.* 2011 Aug;10(4):380–5.
14. ose S, Wasa M, Tazuke Y, et al. *JPEN J Parenter Enteral Nutr.* 2010 Sep-Oct;34(5):530–7.
15. Sukhotnik I, Mogilner JG, Karry R *Digestion.* 2009;79(1):5–13.
16. Mok E, Hankard R. *J Nutr Metab.* 2011;2011:617597.
17. Noé JE. *Integr Cancer Ther.* 2009 Dec;8(4):409–15.
18. Stachowicz-Stencel T, Synakiewicz A *Expert Opin Investig Drugs.* 2012 Aug 23.
19. Haynes TE, Li P, Li X, et al. *Amino Acids.* 2009 May; 37(1):131–42.
20. Li Y, Yu Z, Liu F, Tan L, Wu B, Li J. *Tumori.* 2006 Sep-Oct;92(5):396-401.
21. Das S, Kar Mahapatra S, Gautam N, Das A, Roy S. *Support Care Cancer.* 2007 Dec;15(12):1399-405.
22. Song HY, Jiang CH, Yang JR, et al. *Zhonghua Gan Zang Bing Za Zhi.* 2009 Oct;17(10):754–8.
23. Samocha-Bonet D, Wong O, Synnott EL, et al. *J Nutr.* 2011 Jul;141(7):1233–8.
24. Cheng S, Rhee EP, Larson MG, et al. *Circulation.* 2012 May 8;125(18):2222–31.
25. Letellier G, Mok E, Alberti C, et al. *Clin Nutr.* 2012 Sep 14. pii: S0261–5614(12)00186–0.
26. De Souza AZ, Zambom AZ, Abboud KY, Reis SK, Tannihão F, Guadagnini D, Saad MJ, Prada PO. *Nutrition.* 2015 Jun;31(6):884—9.
27. Billerey-Larmonier C, Uno JK, Larmonier N, et al. *Inflamm Bowel Dis.* 2008 Jun;14(6):780-93.
28. Camacho-Barquero L, Villegas I, Sánchez-Calvo JM, et al. *Int Immunopharmacol.* 2007 Mar;7(3):333-42. Epub 2006 Dec 18.
29. Larmonier CB, Midura-Kiela MT, Ramalingam R, et al. *Inflamm Bowel Dis.* 2011 Feb;17(2):503-15.
30. Ali T, Shakir F, Morton J. *Digestion* 2012;85:249–55.
31. Anand P, Kunnumakkara AB, Newman RA, Aggarwal BB. *Mol Pharmaceut* 2007;4(6):807–18.
32. Bisht S, Maitra A. *Curr Drug Discov Tech* 2009;6:192–9.
33. Sasaki H, Sunagawa Y, Takahashi K, et al. *Biol Pharm Bull.* 2011;34(5):660–5.
34. Kanai M, Imaizumi A, Otsuka Y, et al. *Cancer Chemother Pharmacol.* 2012 Jan;69(1):65–70.
35. Sunagawa Y, Hirano S, Katanasaka Y, et al. *J Nutr Sci Vitaminol* (Tokyo) 2015;61:37–44
36. Kim H. Glutamine as an immunonutrient. *Yonsei Med J.* 2011 Nov;52(6):892–7.
37. Benjamin J, Makharia G, Ahuja V, et al. *Dig Dis Sci.* 2012 Apr;57(4):1000–12.
38. Peng Z, Ban K, Sen A, et al. *Peng Shock.* 2012 Jul;38(1):57–62.
39. Borges Dock-Nascimento D, Aguilar-Nascimento JE, Caporossi C, et al. *Nutr Hosp.* 2011 Jan-Feb;26(1):86–90.

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