

Vitamin C
1,000 mg

DESCRIPTION

Vitamin C, provided by Douglas Laboratories, contains 1000 mg of vitamin C as L-ascorbic acid per tablet.

FUNCTIONS

Vitamin C (ascorbic acid) has numerous biological functions. Foremost, it is essential for the synthesis of collagen and glycosaminoglycans which are the building materials of all connective tissues, such as skin, blood vessels, tendons, joint cartilage and bone. Vitamin C is the required coenzyme for two groups of enzymes that catalyze the crosslinking of collagen fibers-lysyl hydroxylases and prolyl hydroxylases. As such, vitamin C is essential for normal wound healing and capillary health.†

Vitamin C is among the most powerful antioxidants in humans and animals. It is a water-soluble, chain-breaking antioxidant that reacts directly with superoxide, hydroxyl radicals, and singlet oxygen. Laboratory studies show that vitamin C completely protects lipids in plasma and low-density lipoprotein (LDL) against peroxidative damage. In addition, vitamin C interacts with glutathione and alpha-lipoic acid, and regenerates vitamin E. The antioxidant functions of vitamin C appear to have clinical significance in providing protection from free radical damage to the eyes, lungs, blood and the immune system.†

Vitamin C is absorbed in the small intestine by a sodium-dependent transport process that is intake dependent. Absorption efficiency and vitamin C utilization may be greatly enhanced during conditions of physiological stress, such as trauma or infection. Maximal absorption is attained by the ingestion of several doses spaced throughout the day rather than in one, larger dose.

INDICATIONS

Vitamin C may be a useful dietary supplement for those who wish to increase their daily intake of this important antioxidant vitamin.

FORMULA (#82106)

Each tablet contains:

L-ascorbic acid 1,000 mg

SUGGESTED USE

Adults take one tablet daily with a meal or as directed by a healthcare professional.

SIDE EFFECTS

High dosages of Vitamin C consumed at one time may cause bowel distress or diarrhea.

STORAGE

Store in a cool, dry place, away from direct light. Keep out of reach of children.

REFERENCES

Alcaín FJ, Burón MI. Ascorbate on cell growth and differentiation. J Bioenerg Biomembr 1994;26:393-398.
 Ballmer PE, Reinhart WH, Jordan P, Bühler E, Moser UK, Gey KF. Depletion of plasma vitamin C but not of vitamin E in response to cardiac operations. J Thorac Cardiovasc Surg 1994;108:311-320.
 Barabás J, Nagy E, Degrell I. Ascorbic acid in cerebrospinal fluid--A possible protection against free radicals in the brain. Arch Gerontol Geriatr 1995;21:43-48.
 Bendich A, Langseth L. The health effects of vitamin C supplementation: A review. J Am Coll Nutr

Vitamin C

1,000 mg

1995;14:124-136.

Beyer RE. The role of ascorbate in antioxidant protection of biomembranes: Interaction with vitamin E and coenzyme Q. *J Bioenerg Biomembr* 1994;26:349-358.

Bielory L, Gandhi R. Asthma and vitamin C. *Ann Allergy* 1994;73:89-96.

Cathcart RF, III. Vitamin C in the treatment of acquired immune deficiency syndrome (AIDS). *Med Hypotheses* 1984;14:423-433.

Cunningham JJ, Mearkle PL, Brown RG. Vitamin C: An aldose reductase inhibitor that normalizes erythrocyte sorbitol in insulin-dependent diabetes mellitus. *J Am Coll Nutr* 1994;13:344-350.

Eriksson J, Kohvakka A. Magnesium and ascorbic acid supplementation in diabetes mellitus. *Ann Nutr Metab* 1995;39:217-223.

Faruque MO, Khan MR, Rahman M, Ahmed F. Relationship between smoking and antioxidant nutrient status. *Br J Nutr* 1995;73:625-632.

Frei B. Reactive oxygen species and antioxidant vitamins: Mechanisms of action. *Am J Med* 1994;97 Suppl. 3A:5S-13S.

Gale CR, Martyn CN, Winter PD, Cooper C. Vitamin C and risk of death from stroke and coronary heart disease in cohort of elderly people. *BMJ* 1995;310:1563-1566.

Gerster H. Antioxidant vitamins in cataract prevention. *Z Ernährungswiss* 1989;28:56-75.

Ghosh SK, Ekpo EB, Shah IU, Girling AJ, Jenkins C, Sinclair AJ. A double-blind, placebo-controlled parallel trial of vitamin C treatment in elderly patients with hypertension. *Gerontology* 1994;40:268-272.

Goldenberg H, Schweinzer E. Transport of vitamin C in animal and human cells. *J Bioenerg Biomembr* 1994;26:359-368.

Green MHL, Lowe JE, Waugh APW, Aldridge KE, Cole J, Arlett CF. Effect of diet and vitamin C on DNA strand breakage in freshly-isolated human white blood cells. *Mutat Res DNAGing Genet Instability Aging* 1994;316:91-102.

Harakeh S, Jariwalla RJ. Comparative study of the anti-HIV activities of ascorbate and thiol-containing reducing agents in chronically HIV-infected cells. *Am J Clin Nutr* 1991;54:1231S-1235S.

Hemilä H, Herman ZS. Vitamin C and the common cold: A retrospective analysis of Chalmers' review. *J Am Coll Nutr* 1995;14:116-123.

Hennekens CH. Antioxidant vitamins and cancer. *Am J Med* 1994;97 Suppl. 3A:2S-4S.

Jariwalla RJ, Harakeh S. Ascorbic Acid and AIDS: Strategic Functions and Therapeutic Possibilities. In: WATSON RR, ed. *Nutrition and AIDS*. Boca Raton: CRC Press, Inc. 1994:117-139.

Johnston CS, Yen M-F. Megadose of vitamin C delays insulin response to a glucose challenge in normoglycemic adults. *Am J Clin Nutr* 1994;60:735-738.

Khaw K-T, Woodhouse P. Interrelation of vitamin C, infection, haemostatic factors, and cardiovascular disease. *BMJ* 1995;310:1559-1563.

Knekt P, Reunanen A, Järvinen R, Seppänen R, Heliövaara M, Aromaa A. Antioxidant vitamin intake and coronary mortality in a longitudinal population study. *Am J Epidemiol* 1994;139:1180-1189.

Kodama M, Kodama T. Vitamin C and the genesis of autoimmune disease and allergy. *In Vivo* 1995;9:231-238.

Kodama M, Kodama T, Murakami M. Autoimmune disease and allergy are controlled by vitamin C treatment. *In Vivo* 1994;8:251-258.

Lehr H-A, Frei B, Arfors K-E. Vitamin C prevents cigarette smoke-induced leukocyte aggregation and adhesion to endothelium in vivo. *Proc Natl Acad Sci USA* 1994;91:7688-7692.

Mukhopadhyay CK, Chatterjee IB. Free metal ion-independent oxidative damage of collagen. Protection by ascorbic acid. *J Biol Chem* 1994;269:30200-30205.

Paolisso G, Balbi V, Volpe C, et al. Metabolic benefits deriving from chronic vitamin C supplementation in aged non-insulin dependent diabetics. *J Am Coll Nutr* 1995;14:387-392.

Sauberlich HE. Pharmacology of vitamin C. *Annu Rev Nutr* 1994;14:371-391.

Seddon JM, Ajani UA, Sperduto RD, et al. Dietary carotenoids, vitamins A, C, and E, and advanced age-related macular degeneration. Eye Disease Case-Control Study Group. *JAMA* 1994;272:1413-1420.

Winkler BS, Orselli SM, Rex TS. The redox couple between glutathione and ascorbic acid: A chemical and physiological perspective. *Free Radic Biol Med* 1994;17:333-349.

Vitamin C

1,000 mg

Yokoyama T, Sasaki H, Giblin FJ, Reddy VN. A physiological level of ascorbate inhibits galactose cataract in guinea pigs by decreasing polyol accumulation in the lens epithelium: a dehydroascorbate-linked mechanism. *Exp Eye Res* 1994;58:207-218.

For more information on Vitamin C visit douglaslabs.com

† 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.

Manufactured by
Douglas Laboratories
600 Boyce Road
Pittsburgh, PA 15205
800-245-4440
douglaslabs.com



**You trust Douglas Laboratories.
Your patients trust you.**

© 2013 Douglas Laboratories. All Rights Reserved