

Tri-En-All 400

Contains Natural Unesterified Mixed Tocopherols and Tocotrienols

DESCRIPTION

Tri-En-All 400 by Douglas Laboratories® contains 400 I.U. of 100% natural-source, unesterified vitamin E (d-alpha-tocopherol), as well as a guaranteed minimum of the d-beta, d-gamma and d-delta tocopherols, which is unique among most mixed tocopherol products available. In addition, 25 mg of palm derived mixed tocotrienols are included in Tri-En-All 400. No synthetic vitamin E is used.

FUNCTIONS

Vitamin E is one of the body's most important antioxidant nutrients. Antioxidants protect healthy cells from oxidative and free radical damage. Free radicals are unstable chemicals formed in the body during metabolism and from exposure to environmental sources, such as pollution and cigarette smoke. Free radicals are necessary for energy metabolism and immune function, but when an excessive number of free radicals are formed, they can attack healthy cells, especially cell membrane lipids and proteins. This, in turn, is thought to contribute to a number of degenerative diseases. Vitamin E is an especially valuable antioxidant in the cell membranes, where it prevents oxidation of unsaturated fatty acids by trapping free radicals. This helps stabilize and protect cell membranes, especially red blood cells and tissues sensitive to oxidation, such as the lungs, eyes, and arteries. Vitamin E also protects the liver and other tissues from the free-radical damage of toxicants, such as mercury, lead, ozone, nitrous oxide, carbon tetrachloride, benzene, cresol, and various drugs.

Related to its antioxidant properties, vitamin E is important for normal immune function, and many studies show that it prevents lipid peroxidation of blood lipoproteins, such as LDL-cholesterol.

While many think that the term "vitamin E" refers to a single entity, it actually describes a family of eight different compounds known as the tocopherols and the tocotrienols. Both the tocopherols and tocotrienols are further divided into their alpha, beta,

gamma and delta isomers. These two groups of compounds are similar with respect to their structure, but do have subtle molecular structure differences. The d-alpha tocopherol isomer is the most well-known form of vitamin E. However, recent scientific evidence indicates that gamma-tocopherol may possess unique, distinguishable features. This tocopherol is the major form of vitamin E in seeds and in the US diet, though it has not been studied as broadly as alpha-tocopherol. Numerous studies have shown gamma-tocopherol to have excellent antioxidant abilities that complement the antioxidant ability of alpha-tocopherol. Additionally, some studies have shown that high dose supplementation of alpha-tocopherols can deplete both plasma and tissue levels of gamma-tocopherol in the body.

Tocotrienols are found in various foods, but are particularly abundant in rice bran and palm oil. Like tocopherols, tocotrienols function as powerful antioxidants. In certain systems, there is evidence that tocotrienols may even possess greater antioxidant activity compared with tocopherols. In addition to their antioxidant function, tocotrienols have demonstrated the ability to reduce cholesterol synthesis by inhibiting the hepatic enzyme 3-hydroxy-3-methylglutaryl coenzyme A reductase, a rate-limiting enzyme in cholesterol biosynthesis. This finding has resulted in research investigating the ability of tocotrienols to affect cholesterol levels as well as other cardiovascular health parameters. Tri-En-All 400 is different from most mixed tocopherols products because it contains natural mixed tocopherols with a minimum guaranteed amount of the d-beta, d-gamma and d-delta tocopherols, as well as a significant amount of natural mixed tocotrienols.

INDICATIONS

Tri-En-All may be a useful dietary supplement for individuals wishing to supplement their diet with all eight forms of vitamin E.

(continued on reverse)

FORMULA (#98738)

Each softgel contains:

Vitamin E (as d-alpha tocopherol)	400	I.U.
With mixed tocopherols providing a minimum of		
Gamma-tocopherol	280	mg
Beta- and Delta-tocopherol	40	mg
Mixed Tocotrienols (from palm)	25	mg
Supplying approximately:		
Alpha-tocotrienol	14	mg
Beta and Delta-tocotrienols	3	mg
Gamma-tocotrienol	8	mg

SUGGESTED USE

Adults take 1 softgel daily with meals or as directed by physician.

SIDE EFFECTS

No adverse side effects reported.

STORAGE

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

REFERENCES

- Abbey M. The importance of vitamin E in reducing cardiovascular risk. *Nutr Rev* 1995;53 Suppl.S28-S32.
- Anderson LE, Sr., Myer RO, Brendemuhl JH, McDowell LR. Bioavailability of various vitamin E compounds for finishing swine. *J Anim Sci* 1995;73:490-495.
- Beales PE, Williams AJK, Albertini MC, Pozzilli P. Vitamin E delays diabetes onset in the non-obese diabetic mouse. *Horm Metab Res* 1994;26:450-452.
- Brown KM, Morrice PC, Duthie GG. Vitamin E supplementation

suppresses indexes of lipid peroxidation and platelet counts in blood of smokers and nonsmokers but plasma lipoprotein concentrations remain unchanged. *Am J Clin Nutr* 1994;60:383-387.

Calzada C, Bizzotto M, Paganga G, et al. Levels of antioxidant nutrients in plasma and low density lipoproteins: A human volunteer supplementation study. *Free Radic Res* 1995;23:489-503.

Carpenter KLH, Cheeseman KH, Van der Veen C, Taylor SE, Walker MK, Mitchinson MJ. Depletion of alpha-tocopherol in human atherosclerotic lesions. *Free Radic Res* 1995;23:549-558.

Cheeseman KH, Holley AE, Kelly FJ, Wasil M, Hughes L, Burton G. Biokinetics in humans of RRR-a-tocopherol: The free phenol, acetate ester, and succinate ester forms of vitamin E. *Free Radic Biol Med* 1995;19:591-598.

Das S. Vitamin E in the genesis and prevention of cancer--A review. *Acta Oncol* 1994;33:615-619.

Dutta-Roy AK, Gordon MJ, Campbell FM, Duthie GG, James WPT. Vitamin E requirements, transport, and metabolism: Role of a-tocopherol-binding proteins. *J Nutr Biochem* 1994;5:562-570.

Felemovicus I, Bonsack ME, Baptista ML, Delaney JP. Intestinal radioprotection by vitamin E (alpha-tocopherol). *Ann Surg* 1995;222:504-510.

Flagg EW, Coates RJ, Greenberg RS. Epidemiologic studies of antioxidants and cancer in humans. *J Am Coll Nutr* 1995;14:419-427.

Jiang Q, Christen S, Shigenaga MK, Ames BN. gamma-tocopherol, the major form of vitamin E in the US diet, deserves more attention. *Am J Clin Nutr* 2001 Dec;74(6):714-22

Kamat JP, Devasagayam TP. Tocotrienols from palm oil as potent inhibitors of lipid peroxidation and protein oxidation in rat brain mitochondria. *Neurosci Lett* 1995;195:179-82.

Kooyong D, Geller M, Watkins T. Palm oil antioxidant effects in patients with hyperlipidemia and carotid stenosis - 2 year experience. *Asia Pacific J Clin Nutr* 1997;6:72-75.

Mo H, Elson CE. Apoptosis and cell-cycle arrest in human and murine tumor cells are initiated by isoprenoids. *J Nutr* 1999;129:804-13.

Qureshi AA, Bradlow BA, Brace L, et al. Response of hypercholesterolemic subjects to administration of tocotrienols. *Lipids* 1995;30:1171-7.

**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**