Vitamin E Complete with Selenium

(with Mixed Tocopherols and Tocotrienols)

Stock #1509-8 (60 capsules)
Stock #1508-5 (200 capsules)

For decades, vitamin E has been regarded as one of the most popular single-ingredient dietary supplements. Ongoing research has substantiated vitamin E's potent antioxidative ability to treat chronic and degenerative diseases such as cardiovascular disease and cancer.[1]

Several observational surveys have linked populations with a large intake of vitamin E with reduced incidence of cardiovascular disease. Studies have also found that men and women with high intakes of vitamin E have less coronary artery disease—a chronic disease in which the coronary arteries are hardened and narrowed (atherosclerosis). In addition, vitamin E supplementation has been associated with a significant reduction in myocardial infarction (heart attack). Results from the 1996 Cambridge Heart Antioxidant Study (CHAOS) showed that natural vitamin E (400 to 800 IU daily) reduced the risk of nonfatal heart attacks by 77% in patients with coronary atherosclerosis. Likewise, a large double-blind, placebo-controlled, randomized trial found that patients with kidney disease, who also had pre-existing cardiovascular disease, had a 70% reduction in nonfatal heart attacks while taking natural vitamin E (800 IU daily).[2-6]

There is also evidence to suggest that individuals with higher serum vitamin E levels, as well as those taking vitamin E supplements, have a decreased risk of some cancers, including gastrointestinal, lung, prostate and stomach cancer. Likewise, a population-based study conducted between 1984 and 1985 showed reduced oral and esophageal cancer among those who regularly supplemented with vitamin E. In addition, randomized clinical trials have demonstrated protective effects of vitamin E against prostate cancer. In fact, preclinical, epidemiological, and phase III data from randomized, placebo-controlled clinical trials suggest that both vitamin E and selenium have potential efficacy in prostate cancer prevention. Furthermore, vitamin E has been shown to reduce the side effects of chemotherapy. Supplementation with vitamin E among patients on cisplatin chemotherapy has been shown to significantly lower the incidence and severity of peripheral neurotoxicity—toxicity to nervous tissue including both the brain and peripheral nerves—compared to patients who were not supplemented with vitamin E. Neurotoxicity is a common side effect of cisplatin therapy that can manifest as polyneuropathy (a disorder involving slowly progressive or repeated episodes of loss of movement or sensation, related to inflammation of multiple nerves), ototoxicity (damage to the hearing or balance functions of the ear, caused by drugs or chemicals) or, rarely, focal encephalopathy (a degenerative brain disorder caused by disease, injury, drugs or chemicals).[7-13]

Recent findings indicate that vitamin E has a much broader array of biological activities than originally determined. Along with its established role as an antioxidant, it is becoming evident that vitamin E can also suppress local and chronic inflammation; improve insulin sensitivity in type 2 diabetes, nondiabetics and hypertensives (individuals with high blood pressure); and enhance immune function. Vitamin E is actually present in higher concentrations in immune cells than in any other cells of the body. Studies show that people with lower serum levels of vitamin E are significantly more susceptible to infection than those with higher levels. However, supplemental vitamin E has been found to improve immune responses in both sick and healthy individuals.[8,9,14-18]

Vitamin E has also shown promise in treating preeclampsia—a complication of pregnancy involving hypertension (high blood pressure) and edema, which is a major cause of both maternal and fetal-neonatal morbidity (a diseased condition) and mortality (death). Two different studies by researchers in India found significantly lower blood levels of vitamin E (as well as vitamin C) in preeclamptic women as compared to normotensive pregnant and non-pregnant women. Likewise, a recent study conducted in England involving 53 preeclamptic women found that selenium concentrations were significantly lower in the preeclamptic subjects than in healthy pregnant matched controls.[1,19,20]

Furthermore, several human studies have found that low levels of vitamin E intake are associated with increased risk for cataract development. One study found that the risk of nuclear opacification—clouding of the ocular (eye) lens, which is associated closely with the development of cataracts—among regular users of vitamin E supplements and individuals with higher plasma levels of vitamin E was reduced by approximately half.[8,21-24]

Vitamin E is actually not a single entity, but rather a lipid (fat) soluble micronutrient containing 8 active, naturally occurring plant constituents—4 tocopherols (alpha, beta, delta, gamma) and 4 tocotrienols (alpha, beta, delta, gamma). Collectively, these compounds are known as vitamin E. Researchers have determined that the biologic functions of tocopherols and tocotrienols appear unrelated, thus indicating a need for both. For example, tocotrienols appear to have tumor-inhibiting properties against breast cancer cells, which is a property tocopherols do not appear to have. Tocotrienols also demonstrate lipid-lowering effects. A double-blind, crossover, 8-week study of 25 men and

women found that those receiving tocotrienols had a significant reduction in LDL cholesterol levels compared with the placebo group. Additional research has shown that tocotrienols, particularly gamma-tocotrienol, may fight arteriosclerosis—a cause of heart attacks and strokes—better than tocopherols. Furthermore, preliminary data indicates that tocotrienols can cross the blood-brain barrier and are potent protectors of neuron cells that may be killed as a result of stroke and other neurodegenerative diseases. In fact, the antioxidant powers of tocotrienols have been proven to be much stronger than tocopherols.Thus, research suggests that a prudent approach to vitamin E supplementation for a healthy individual may be to take a supplement providing mixed tocopherols and tocotrienols.[8,25-32]

Historically, experts theorized that vitamin E would increase the effects of warfarin (Coumadin) by causing a deficiency of vitamin K—a fat-soluble vitamin responsible for blood clotting. However, in a recent double-blind clinical trial of 21 patients on chronic warfarin therapy, no significant effect on prothrombin times (a test that measures the clotting time of blood) was observed when 800-1200mg of vitamin E per day was given. Researchers concluded that "it appears that vitamin E can safely be given to patients who require chronic warfarin therapy.“[8,26,33]

Natural vitamin E (*d*-alpha-tocopherol) has a higher bioavailability than synthetic vitamin E (*dl*-alpha-tocopherol).In one study, Japanese researchers found that it took 300mg of synthetic vitamin E to equal the blood levels achieved in healthy subjects by a 100mg dose of natural vitamin E. Furthermore, researchers at Oregon State University found that the human body excretes synthetic vitamin E three times faster than natural vitamin E. Natural forms of vitamin E are extracted from wheat germ oil, soybeans and other vitamin E food sources, unlike synthetic forms, which are extracted from petroleum oils. Furthermore, since vitamin E is fat soluble, supplements may be better-absorbed when taken with food.[8,34-37]

Each softgel capsule of NSP’s Vitamin E Complete with Selenium provides 400 IU natural vitamin E, including 30mg tocopherols (alpha, beta, delta and gamma) and 5mg mixed tocotrienols (alpha, beta, delta and gamma), in a base of soybean oil and annatto (a natural food coloring and antioxidant agent).[38,39]

Selenium is a trace mineral that works together with vitamin E as an antioxidant. Low levels of selenium have been associated with increased risk of cardiovascular disease, asthma, endemic goiter (enlarged thyroid), sudden infant death syndrome (SIDS), and multiple sclerosis, as well as cervical dysplasias (abnormal cervical tissue growths) in women. Selenium levels also appear to be severely depleted in individuals suffering from liver disease, especially cirrhosis and hepatitis.Furthermore, results show children with food allergy display higher risk of selenium deficiency.[40-43]

An association between selenium status and low plasma T3 (a thyroid hormone) levels has also been documented. In fact, areas with severe selenium deficiency report a higher incidence of thyroiditis—an autoimmune disorder that destroys the thyroid. In a randomized, blinded, placebo-controlled study in women with autoimmune thyroiditis, selenium supplementation (200mcg daily for 3 months) significantly decreased thyroid (peroxidase) specific antibodies (TPOAb) from 100% to 63.6%, while more importantly, 9 out of 36 patients exhibited completely normalized antibody concentrations. Plasma TPOAb levels, which reflect thyroid inflammation, are believed to be a specific indicator for autoimmune thyroiditis.[40,44]

Low dietary levels of selenium have also been associated with an increased incidence of cancer. In 1996, a clinical intervention study found that patients treated with selenium had significant reductions in total cancer mortality, total cancer incidence, and incidences of lung, colorectal, and prostate cancers. A number of U.S. studies have confirmed that men with low intake of selenium have a higher risk of prostate cancer than men with high intake of selenium. Likewise, recent clinical trials have shown that selenium significantly reduces the incidence of clinical prostate cancer. For example, results of one randomized, double-blind, controlled cancer prevention trial found that selenium treatment was associated with a significant (63%) reduction in prostate cancer incidence.Prostate cancer is the most common cancer diagnosed and the second leading cause of cancer-related deaths in men in the U.S. Furthermore, on February 21, 2003, the Food and Drug Administration (FDA) authorized the use of 2 health claims in the labeling of dietary supplements containing selenium—first, selenium may reduce the risk of certain cancers; and second, selenium may produce anticarcinogenic effects in the body. However, the FDA also required labels to include the disclaimer, "the FDA has determined that this evidence is limited and not conclusive.“[45-50]

In addition to its antioxidant and anti-cancer properties, selenium also appears to work as an anti-inflammatory agent in certain disorders such as rheumatoid arthritis—a chronic inflammatory disease with marked selenium deficiency that destroys the joints. Results of a double-blind study found that supplementing with selenium (200mcg daily for 3 months) significantly reduced painful joint involvement—patients demonstrated less morning stiffness and tender or swollen joints. Furthermore, selenium may also be effective in the treatment and prevention of other conditions, including cystic fibrosis (a genetic disease affecting the pancreas, respiratory system and sweat glands), otitis media (middle ear infection/inflammation), and celiac disease (an inability to tolerate the wheat protein gluten), as well as

slowing the aging process.[40,41,51]

References:

[1]Gailing CN, S. "Vitamin E 2000." *Nutrition Science News*; March 2001.
[2]Dutta, A. & Dutta, S.K. "Vitamin E and its role in the prevention of atherosclerosis and carcinogenesis: a review." *Journal of the American College of Nutrition*; 2003, 22(4):258-268.
[3]Yusoff, K. "Vitamin E in cardiovascular disease: has the die been cast?" *Asia Pacific Journal of Clinical Nutrition*; 2002, 11 Suppl 7:S443-447.
[4]Stephens, N.G., et al. "Randomized controlled trial of vitamin E in patients with coronary disease: Cambridge heart antioxidant study (CHAOS)." *Lancet*; 1996, 347:781-786.
[5]Challem, J. "Vitamin E Prevents." *Nutrition Science News*; November 2001.
[6]Jialal, I., et. al. "Is there a vitamin E paradox?" *Current Opinion in Lipidology*; 2001, 12(1):49-53.
[7]Sung, L., et. al. "Vitamin E: the evidence for multiple roles in cancer." *Nutrition and Cancer*; 2003, 46(1):1-14.
[8]Ford-Martin, P. "Vitamin E." *Gale Encyclopedia of Alternative Medicine.*<http://www.findarticles.com/cf_dls/g2603/0007/2603000729/p1/article.jhtml>. Accessed April 2004.
[9]Janson MD, M. "A Supplement Plan for Seniors." *Nutrition Science News*; December 1999.
[10]Patterson, R.E., et. al. "Vitamin supplements and cancer risk: the epidemiologic evidence." *Cancer Causes & Control*; 1997, 8(5):786-802.
[11]Klein, E.A., et. al. "SELECT: the selenium and vitamin E cancer prevention trial." *Urologic Oncology*; 2003, 21(1):59-65.
[12]Pace, A., et al. "Neuroprotective effect of vitamin E supplementation in patients treated with cisplatin chemotherapy." *Journal of Clinical Oncology*; 2003, 21:927-931.
[13]Gaby, A.R. "Vitamin E prevents chemotherapy side effect." *Townsend Letter for Doctors and Patients*; August-September 2003.
[14]Bron, D. & Asmis, R. "Vitamin E and the prevention of atherosclerosis." *International Journal for Vitamin and Nutrition Research*; 2001, 71(1):18-24.
[15]Patrick ND, L. "Nonalcoholic Fatty Liver Disease: Relationship to Insulin Sensitivity and Oxidative Stress. Treatment Approaches Using Vitamin E, Magnesium, and Betaine." *Alternative Medicine Review*; 2002, 7(4):276-291.
[16]Barbagallo, M., et. al. "Effects of vitamin E and glutathione on glucose metabolism: role of magnesium." *Hypertension*; 1999, 34(4 Pt 2):1002-1006.
[17]Paolisso, G., et. al. "Pharmacologic doses of vitamin E improve insulin action in healthy subjects and non-insulin-dependent diabetic patients." *American Journal of Clinical Nutrition*; 1993, 57(5):650-656.
[18]Wolfson ND, D. "A Shield of Immunity." *Nutrition Science News*; September 1999.
[19]Jain, S.K. & Wise, R. "Relationship between elevated lipid peroxides, vitamin E deficiency and hypertension in preeclampsia." *Molecular and Cellular Biochemistry*; 1995, 151(1):33-38.
[20]Rayman, M.P., et. al. "Low selenium status is associated with the occurrence of the pregnancy disease preeclampsia in women from the United Kingdom." *American Journal of Obstetrics and Gynecology*; 2003, 189(5):1343-1349.
[21]Lyle, B.J., et. al. "Serum carotenoids and tocopherols and incidence of age-related nuclear cataract." *American Journal of Clinical Nutrition*; 1999, 69(2):272-277.
[22]Head ND, K. "Natural Therapies for Ocular Disorders Part Two: Cataracts and Glaucoma; *Alternative Medicine Review*; 2001, 6(2):141-166.
[23]Leske, M.C., et. al. "Biochemical factors in the lens opacities. Case-control study. The Lens Opacities Case-Control Study Group." *Archives of Ophthalmology*; 1995, 113:1113-1119.
[24]—. "Antioxidant vitamins and nuclear opacities: the longitudinal study of cataract." *Ophthalmology*; 1998, 105:831-836.
[25]Briggs PhD, S. "Vitamin E: Weighing the Tocopherols." *Nutrition Science News*; January 1999.
[26]Swain, R.A. & Kaplan-Machlis, B. "Therapeutic uses of vitamin E in prevention of atherosclerosis." *Alternative Medicine Review*; 1999, 4(6):414-423.
[27]Jiang, Q., et al. "Gamma-tocopherol, the major form of vitamin E in the US diet, deserves more attention." *American Journal of Clinical Nutrition*; 2001, 74:714-722.
[28]Zimmerman CN, M. "Phytochemicals: Nutrients Whose Time Has Come." *Nutrition Science News*; July 2000.
[29]Babal CN, K. "Botanicals Not The Only Growth Category." *Nutrition Science News*; January 1999.
[30]"Evaluation of the Antihyperlipidemic Properties of Dietary Supplements." *Nutrition Research Newsletter*; July 2001.
[31]"Study focuses on vitamin E's role in reducing effects of neuro-degenerative diseases." *Townsend Letter for Doctors and Patients*; October 2002.
[32]Gaby, A.R. "Vitamin E: the importance of gamma-tocopherol." *Townsend Letter for Doctors and Patients*; February-March 2003.
[33]Kim, J.M. & White, R.H. "Effect of vitamin E on the anticoagulant response to warfarin." *American Journal of Cardiology*; 1996, 77(7):545-546.
[34]Jones, M. "Vitamin E: The Natural Alternative." *Functional Foods & Nutraceuticals*; November-December 2001.
[35]Kiyose, C., et al. "Biodiscrimination of a-tocopherol stereoisomers in humans after oral administration." *American Journal of Clinical Nutrition*; 1997, 65:785-789.
[36]Traber, M.G., et al. Synthetic as compared with natural vitamin E is preferentially excreted as a-CEHC in human urine: studies using deuterated a-tocopheryl acetate. *FEBS Letters*; 1998, 437:145-148.
[37]Challem, J. "Natural vs. Synthetic Vitamin E." *Nutrition Science News*; November 2001.
[38]Martinez-Tome, M., et. al. "Antioxidant properties of Mediterranean spices compared with common food additives." *Journal of*

Food Protection; 2001, 64(9):1412-1419.

[39]"Annatto (*Bixa orellana*)." *Raintree Nutrition Tropical Plant Database*, 2003. <http://www.rain-tree.com/annato.htm>. Accessed April 2004.

[40]"Selenium."*Alternative Medicine Review*; 2003, 8(1):63-71.

[41]Frey,R. "Selenium." *Gale Encyclopedia of Alternative Medicine*. <http://www.findarticles.com/cf_dls/g2603/0006/2603000651/p1/article.jhtml?term=>. Accessed April 2004.

[42]Kim, S.Y., et. al. "Changes in lipid peroxidation and antioxidant trace elements in serum of women with cervical intraepithelial neoplasia and invasive cancer." *Nutrition and Cancer*; 2003, 47(2):126-130.

[43]Navarro-Alarcon, M., et. al. "Selenium concentrations in serum of individuals with liver diseases (cirrhosis or hepatitis): relationship with some nutritional and biochemical markers." *The Science of the Total Environment*; 2002, 291(1-3):135-141.

[44]Gartner, R., et al. "Selenium supplementation in patients with autoimmune thyroiditis decreases thyroid peroxidase antibodies concentrations." *Journal of Clinical Endocrinology and Metabolism*; 2002, 87:1687-1691.

[45]Clark, L.C., et. al. "Effects of selenium supplementation for cancer prevention in patients with carcinoma of the skin. A randomized controlled trial. Nutritional Prevention of Cancer Study Group." *Journal of the American Medical Association;* 1996, 276:1957-1963.

[46]Williams ND, M. "Science Beat." *Natural Foods Merchandiser*; January 2004.

[47]Ghosh J. "Rapid induction of apoptosis in prostate cancer cells by selenium: reversal by metabolites of arachidonate 5-lipoxygenase." *Biochemical and Biophysical Research Communications*; 2004, 315(3):624-635.

[48]Clark, L.C., et. al. "Decreased incidence of prostate cancer with selenium supplementation: results of a double-blind cancer prevention trial." *British Journal of Urology*; 1998, 81:730-734.

[49]Meuillet, E., et. al. "Chemoprevention of prostate cancer with selenium: an update on current clinical trials and preclinical findings." *Journal of Cellular Biochemistry*; 2004, 91(3):443-458.

[50]"FDA allows Selenium/cancer health claims." *Townsend Letter for Doctors and Patients*; May 2003.

[51]Heinle, K., et. al. [Selenium concentration in erythrocytes of patients with rheumatoid arthritis. Clinical and laboratory chemistry infection markers during administration of selenium]. *Medizinische Klinik (Munich)*; 1997, 92 Suppl 3:29-31.

