

# Health Benefits of Tocotrienols from Vitamin E Complex

## Cholesterol Reduction

- Inhibit cholesterol production in the liver, thereby lowering total blood cholesterol.
- Alpha tocotrienol suppresses hepatic HMG-CoA reductase activity that results in the lowering of LDL cholesterol levels.
- Tocotrienols which are naturally occurring in palm oil, have been shown to suppress / lower plasma cholesterol in human.
- Combination of gamma-tocotrienol and alpha-tocopherol is found as a potential hypolipemic agent in hyperlipemic humans at atherogenic risk.
- Tocotrienols inhibit cholesterologenesis by suppressing HMG-CoA reductase.

## Reversing Carotid Atherosclerosis

- Reverses arterial blockage (carotid atherosclerosis), hence reducing the risk factors for cardio-vascular diseases such as atherosclerosis and stroke. Palm based tocotrienol is the first and natural compound to be shown by human study to have the ability to reverse atherosclerosis.
- Medical human research showed that patients with confirmed carotid atherosclerosis, who consumed 240mg of palm based tocotrienol complex per day for 18-36 months had a decrease in the amount of cholesterol plaque in their carotid artery while those receiving placebo did not show such an effect.
- Palm based tocotrienol complex protects the ApoE knockout mice against cholesterol build-up and hence prevent arteriosclerosis.

## Protection Against Ischemia/Reperfusion Heart Injury

- Medical study suggests that palm based tocotrienols were more efficient than alpha-tocopherol alone in the protection of the heart against oxidative stress induced by ischemic reperfusion.

## Inhibit of Platelet Aggregation

- Delta-tocotrienol was significantly more potent than the alpha and gamma-tocotrienols, in the inhibition of platelet aggregation.
- Palm based tocotrienols may serve as an antithrombotic agent by decreasing platelet aggregation significantly.

- Based on new scientific publication on tocotrienol and cardioprotection - gamma-tocotrienol is the most potent for cardioprotection. (*AJP Heart and Circulatory Physiology*).

## Neuroprotection

- Based on on-going NIH-funded study and in collaboration with the Ohio State University Medical Center - Prof. Chandan Sen has published 5 peer-reviewed papers which proved that alpha-tocotrienol is the most potent in preventing stroke-induced injuries to the brain.

## Anti-cancer and Tumour Suppressive

- Palm based tocotrienols had shown to inhibit human breast cancer cells irrespective of estrogen receptor status. Tocopherol has no effect at all on human breast cancer cells.
- Delta - tocotrienol was found to be the most effective tocotrienols in inducing apoptosis (cell death) in estrogen-responsive and estrogen-nonresponsive human breast cancer cells.
- Confer anti-cancer properties.
- Inhibit tumor growth of certain cancers.
- Alpha-tocotrienol and gamma-tocotrienol have shown to prolong the life span of cancer-infected mice.
- Gamma-tocotrienol is 3 times more potent in inhibiting growth of human breast cancer cultured cells than Tamoxifen.
- Published research from the East Tennessee University and MD Anderson Cancer Center (Texas) revealed that gamma-tocotrienol was the most potent in inhibiting prostate cancer cells.

## Potent Natural Super - Antioxidant

- Alpha-tocotrienol has been shown to be 40 - 60 times more potent than alpha-tocopherol as an antioxidant in the prevention of lipid peroxidation.
- Effective antioxidant in the prevention of protein oxidation and lipid peroxidation after strenuous exercise for athletes, joggers and body builders.

## Anti - Aging / Cosmetics and Personal Care

- Preferentially accumulates at the stratum corneum of the skin. First line of defense against free radicals generated in the skin by UV/ozone rays. Prevention of skin aging and damage by oxidative rays. Being a more potent antioxidant, the tocotrienols neutralizes free radicals at a faster rate and hence protect tocopherols.
- Protection against UV-induced skin damage and skin aging.
- Tocotrienols topically applied onto the skin was found to penetrate rapidly through the skin and the highest concentrations are found in the uppermost 5 microns.
- Tocotrienol-treated skin contained Vitamin E at concentration 7-30 fold higher than control values.
- Tocotrienol augments the efficacy of sunscreens containing compounds that reduce penetration of or absorb ultraviolet radiation.

## Lower Blood Pressure

- Palm gamma-tocotrienol has ability to prevent development of increased blood pressure in Spontaneously Hypertensive Rats (SHR) after 3 months supplementation.