

Health benefits of dietary intake of virgin coconut oil on neural-immune Network

To investigate the effects of dietary intake of virgin coconut oil on neuroendocrine-immune system and to promote the health benefits of VCO, CDB under the Technology Mission on Coconut programme has sanctioned a project to SRM Institute of Science and Technology, Tamil Nadu. This animal study is expected to provide information about the role of virgin coconut oil in modulating the aging process through cellular and molecular targets.

The VCO diet is proved to be hypolipidemic, enhance Th1 cytokines in the spleen and augment intracellular cell survival signaling pathways in the brain areas of young rats. It enhanced high density lipoprotein cholesterol (HDL-C) levels while lowering triglyceride (TG) levels, total cholesterol to HDL-C ratio, low density lipoprotein cholesterol (LDL-C) to HDL-C ratio and TG to HDL-C ratio in rat serum. The expression of molecular markers of cell survival pathways and antioxidant enzyme activities in the splenocytes were found to be enhanced with VCO diet. Similarly it is reported that, VCO diet facilitate in sustaining neuronal survival signals through upregulation of intracellular cell survival pathways in specific brain areas in thymus and mesenteric lymph nodes, VCO diet suppressed inflammatory markers, promoted intracellular signaling molecules, increased the expression of neuronal and growth factor markers suggesting that it enhances neuroendocrine-immune interactions in young rats.

VCO was proved to promote healthy aging by enhancing Th 1 immunity through the upregulation of cell survival signaling pathways in the spleen and enhancing the antioxidant mechanisms.

VCO diet enhanced both Concanavalin A and LPS-induced splenocyte proliferation in young, middle-aged and old female rats along with an enhancement in Th1 cytokine and NO production while it suppressed the proinflammatory cytokine production. There was also an increase in the activities of antioxidant enzymes and reduction in the extent of lipid peroxidation observed in spleen of VCO-fed group.



Virgin coconut oil diet enhanced cell-mediated immunity in lymphoid organs namely spleen, thymus and mesenteric lymph nodes and neuronal survival in brain through discrete intracellular signaling pathways. There were age-related alterations in the functions of neuroendocrine-immune system with profound changes occurring in female animals. Dietary VCO in middle-aged and old female rats altered immune parameters decelerating the age associated alterations in the functioning of neuroendocrine-immune network.

S. Thyaga Rajan is the Principal Investigator of the study. As per the findings of the project, the following future studies are suggested.

- The molecular mechanisms leading to deceleration of age-associated alterations in neuroendocrine immune system by VCO.
- The modulating capacity of sympathetic nervous system in influencing VCO-induced changes in the neuroendocrine-immune system both centrally and peripherally.
- The intracellular signaling mechanisms and interconnecting between these systems involving upstream and downstream effects in mediating the actions of VCO on neuroendocrine-immune system in healthy men and women and in aging. ■