

VITAMIN E IN SUNFLOWER SEED OIL INFLUENCES PLATELET AGGREGATION AND
AORTIC PROSTACYCLIN PRODUCTION IN THE COMMON MARMOSET

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The inhibitory influence of sunflower seed oil (SSO) on blood coagulation and platelet aggregation in the common marmoset has been attributed to its high (65%) linoleic acid (LA) content (McIntosh et al. 1983). However SSO is also a very rich source of d- α -tocopherol (>400 $\mu\text{g/g}$) and previous observations did not address the possibility that vitamin E, known to be an inhibitor of platelet aggregation, might also be contributing to the effect observed.

Twenty-four mature common marmosets weighing 306 ± 6 g were fed four experimental diets: a vitamin E deficient diet (-E, containing 3 $\mu\text{g/g}$ vitamin E), this diet supplemented with vitamin E (+E, containing 48 $\mu\text{g/g}$), supplemented with SSO stripped of vitamin E (SSO-E, containing 5 $\mu\text{g/g}$) and supplemented with SSO (+SSO + E, containing 41 $\mu\text{g/g}$). The SSO was added at 10% w/w to the deficient diet. The four groups were fed the diets for 9 months during which time influence on health, platelet aggregation, peroxidative haemolysis of erythrocytes and complete blood examination were assessed. At sacrifice body and skeletal muscle weights, plasma and platelet tocopherols and fatty acids and aortic prostacyclin generation were studied.

The vitamin E deficient groups (-E and SSO-E) had lowest body weights which reflected loss of skeletal muscle mass. The haemolytic index for erythrocytes also reflected vitamin E deficiency significantly.

Dietary Tmt	Plasma α Tocoph (μg) cholest (mg)	Haemolysis (%)	Body wt. (g)	% Plt aggn for 6.3 $\mu\text{g/ml}$ ASC	PGF 1 α genesis $\mu\text{g}/30'/\text{disc}$
-E	2.21*	84*	322	88*	1.85*
+E	4.17	9.5	344	72	2.75
SSO-E	2.10*	63.6*	306*	94*	3.27*
SSO+E	5.59	5.3	333	82	4.67

*difference is significant for $p < 0.05$ or less (regression analysis)

Platelet aggregation of platelet rich plasma was significantly reduced by addition of vitamin E and aortic prostacyclin generation was enhanced both by the addition of vitamin E and LA (as SSO). Prostacyclin has an inhibitory effect on platelet aggregation.

Both vitamin E and linoleic acid additions to the diet contributed to the enhanced prostacyclin production, while the vitamin E addition significantly reduced platelet aggregation. However unprotected dietary LA (SSO-E) increased platelet aggregation over the deficient (-E) group. In this respect the supplement of vitamin E from SSO is an important component in reducing thrombogenesis, by its influence both on platelet function and vascular endothelium.

McINTOSH, G.H., EVANS, C., RODGERS, S., LLOYD, J.V. and CHARNOCK, J.S. (1983).
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