

VITAMIN E STATUS AFFECTS PLATELET AGGREGATION IN
THE PIG

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In so far as vitamin E has been shown to be an effective means of inhibiting platelet aggregation in vitro (Steiner, 1978) its potential to do this in vivo under the influence of dietary vitamin E perturbation is of interest. Observations on platelet aggregation in rats on vitamin E deficient and normal diets have been contradictory (Machlin et al., 1975, Whitin et al., 1982).

We have examined the influence of vitamin E (dl α -Tocopherol acetate) supplements to a deficient diet (2ppm vit E) and dietary fat supplements (+10% w/w) of sunflower seed oil and mutton fat to a normal pig diet (11ppm vit E) on platelet aggregation in growing pigs, to assess the influence of vitamin E on platelet aggregation. Kangaroo Island strain pigs were fed diets shown in the table for 6 months, and then plasma tocopherol and creatine phosphokinase (CPK) and platelet tocopherol assays undertaken. Platelet rich plasma was tested for aggregation in a Payton aggregometer using acid soluble collagen and adenosine diphosphate as activating agents.

Tmt	Diet Vit E (ppm)	α Tocopherol (ug/g)		ADP (μ M)		ASC (ug/ml)	
		Plasma	Platelets	T ⁰	50% Max	T ⁰	50% Max
-E	2	0.41	0.85	3	2.7	4.7	4.1
+E	12	0.62	1.30	2	3.3	4.7	3.7
+E	102	1.77	5.50	4	4.6	9.5	7.0
+MF	14	1.19	0.84	1.0	1.8	2.6	1.9
C	11	0.76	2.00	1.0	1.6	3.1	2.1
+SSO	50	3.28	7.73	1.7	2.7	3.7	3.5

Plasma and platelet tocopherol was increased significantly with the high vitamin E and SSO supplemented diets relative to the vitamin E deficient and MF supplemented diets. CPK doubled in the plasma of deficient relative to high vitamin E diet fed pigs.

There was a significant resistance of platelets to aggregation with the high vitamin E supplemented diets relative to the other treatments, shown both by threshold (T⁰) and concentrations to produce 50% maximum aggregation. This degree of response and the increase in platelet tocopherol concentration observed is consistent with observations of Steiner (1978).

Levels of vitamin E supplementation well in excess of that supplied by the normal human diets (5-10ppm) may be required to produce a significant shift in platelet aggregability in the normal population. On the other hand where deficiency is likely to occur for whatever reason, large supplements of vitamin E may have a significant effect.

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