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## Growth-Stimulating Activity of Alpha Tocopherol.\*

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A factor necessary for the normal growth of rats has been reported by several investigators<sup>1-6</sup> to be either vitamin E or a substance closely related to it. Evans, Emerson, and Emerson<sup>7</sup> found that alpha tocopherol stimulated growth in female rats which had plateaued in weight on an E-low diet when it was given at a level of 1 mg daily (6 times weekly) for 50 days. It was felt that the feeding of lower levels of alpha tocopherol might contribute to our understanding of the quantitative relationship between the anti-sterility and growth-stimulating activity of vitamin E.

A sample of synthetic alpha tocopherol (from Merck and Company) assayed with E-low rats of proven sterility, resulted in 100% littering when given in a single 3 mg dose on the day of positive mating.

Six litters of female rats of the Long-Evans stock were placed on the standard E-low diet 427. After approximately 130 days on the diet, they plateaued at an average weight of 237 g. At 153 days of age they were divided into equivalent groups of 6 littermates each and fed the following supplements daily (6 times weekly) for 135 days:

Group I—80 mg ethyl laurate (Controls).

Group II—0.25 mg  $\alpha$ -tocopherol in 80 mg ethyl laurate.

Group III—0.50 mg  $\alpha$ -tocopherol in 80 mg ethyl laurate.

The growth-stimulating activity of the two comparatively low levels of alpha tocopherol is clearly shown (Fig. 1). The growth

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<sup>1</sup> Evans, H. M., *J. Nutr.*, 1928, **1**, 23.

<sup>2</sup> Mason, K. E., *J. Nutr.*, 1929, **1**, 311.

<sup>3</sup> Blumberg, H., *J. Biol. Chem.*, 1935, **108**, 227.

<sup>4</sup> Olecott, H. S., and Mattill, H. A., *J. Biol. Chem.*, 1936, **114**, LXXVII.

<sup>5</sup> Olecott, H. S., and Mattill, H. A., *J. Nutr.*, 1937, **14**, 305.

<sup>6</sup> Emerson, G. A., and Evans, H. M., *J. Nutr.*, 1937, **14**, 169.

<sup>7</sup> Evans, H. M., Emerson, G. A., and Emerson, O. H., *Proc. Soc. Exp. Biol. and Med.*, 1938, **38**, 197.

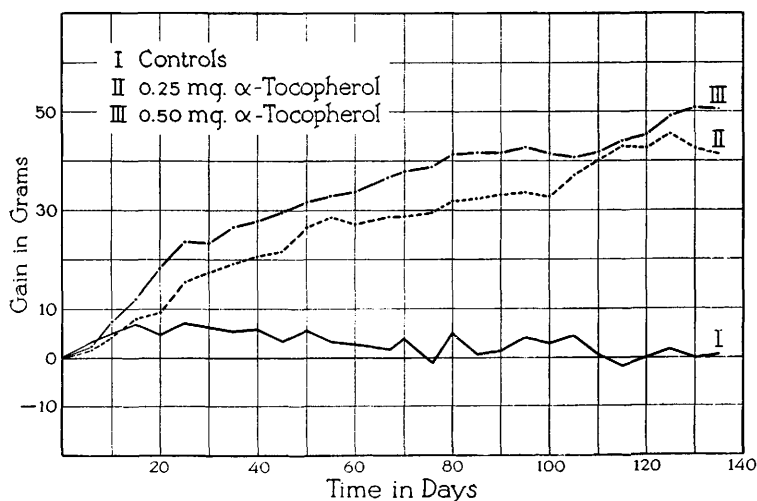


FIG. 1.

stimulation corresponds closely with that obtained in a previous experiment in this laboratory in which 1 mg alpha tocopherol was given for the same length of time (Table I).

*Conclusions.* Growth is stimulated in "plateaued" E-low female rats when their diet is supplemented by the daily administration of alpha tocopherol at the 0.25 and 0.50 mg levels. The growth corresponds approximately to that previously secured by the daily administration of 1 mg of alpha tocopherol.

TABLE I.  
Growth-Promoting Action of Different Levels of Alpha Tocopherol.

Year	6 x weekly supplements	No. of rats	Plateauing wt, g	Period when supplements were fed, days	Gain in wt in 50 days
1938	80 mg ethyl laurate	3	228	195-245	0
	1 mg alpha tocopherol in 80 mg ethyl laurate	6	228	195-245	22
1940	80 mg ethyl laurate	6	237	153-203	5
	0.25 mg alpha tocopherol in 80 mg ethyl laurate	6	237	153-203	27
	0.50 mg alpha tocopherol in 80 mg ethyl laurate	6	237	153-203	32
	80 mg ethyl laurate	6	237	153-203	32