13083 P

Activity of Alpha Tocopherol in Preventing Antagonism Between Linoleic and Linolenic Esters and Carotene.

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The author has shown[1, 2] that the methyl esters of linoleic and linolenic acids interfere with the utilization of carotene and vitamin A by vitamin-A deficient rats. It was found that this antagonism can be counteracted by the addition of soybean oil and is not apparent if sufficiently large amounts of carotene are fed.

Subsequent investigations have revealed that the antagonism between the unsaturated fatty acid esters and carotene can be prevented by the unsaponifiable fraction of soybean oil or by α-tocopherol; but not by choline, ethanolamine, or soybean lecithin or cephalin.

The growth obtained with carotene and α-tocopherol was only slightly better than that with carotene alone, but the addition of α-tocopherol to carotene and methyl linolate or linolenate gave a pronounced growth response. The antagonism between methyl linolenate and carotene was more pronounced than that between methyl linolate and carotene. The addition of α-tocopherol gave better growth with methyl linolate than with methyl linolenate.

It is improbable that α-tocopherol acts as a simple chemical anti-

TABLE I.
Growth Responses of Vitamin A-Deficient Rats.*

Daily supplements	No. of rats	Avg gain end of 7th week, g
2 γ Carotene	8	31
2 γ " and 1 mg α-tocopherol	4	46
2 γ " + .05 g methyl linolate	10	19
2 γ " + .05 g methyl linolate + unsaponifiable matter from 0.1 ml soybean oil	9	81
2 γ " + .05 g methyl linolate + 1 mg α-tocopherol	20	80
2 γ " + .05 g methyl linolenate	4	9
2 γ " + .05 g methyl linolenate + 1 mg α-tocopherol	8	48

*All rats received a diet of the following composition during the depletion and experimental periods: casein (alcohol extracted) 18, salt mixture No. 186 (*J. Biol. Chem.*, 1930, **89**, 199) 4, Northwestern yeast, irradiated 6, and sucrose 72.

1 Sherman, W. C., *J. Biol. Chem.*, Proc., 1940, **133**, 89.

2 Sherman, W. C., *J. Nutrition*, in press.

oxidant since *in vitro* experiments[2] have shown that the unsaturated fatty acid esters cause no direct destruction of carotene with the method of feeding employed. It appears that in the absence of α-tocopherol there is a physiological antagonism between unsaturated fatty acids and carotene which results in the inefficient utilization of carotene.

13084 P

Immunological Properties of an Antibody Containing a Fluorescent Group.*

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(Introduced by J. F. Enders.)

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Previous investigations involving chemical derivatives of antibodies usually have been planned either to establish the protein nature of the antibody molecule, or to elucidate the influence of specific polar groups on the mechanism of the antigen-antibody reaction. Reiner,[1] however, prepared serologically active atoxyl-azo conjugates of antipneumococcus I and II antibodies, and suggested that they might be useful in quantitative studies of antigen-antibody reactions. Marrack[2] allowed anti-typhoid and anti-cholera sera to react with diazotized benzidine-azo-R-salt, and demonstrated that homologous organisms were specifically colored pink by the chemically modified antibodies.

The objective of the present investigation is the development of a method by which antigenic substances could be revealed in mammalian tissues.

One of us (A.H.C.)‡ has repeated Marrack's experiment with antipneumococcus II and III rabbit sera,§ and has found that sus-

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1 Reiner, L., *Science*, 1930, **72**, 483.

2 Marrack, J., *Nature*, 1934, **133**, 292.

‡ Unpublished data.

§ Lederle's concentrated therapeutic rabbit sera were used in this work. The pneumococcus-antipneumococcus system was chosen for convenience in developing the method.