some investigators have found that the periodate consumption increases slowly all the time and never comes to a standstill.

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Influence of Vitamin E on the Utilization of Carotene from Oils

IN a previous communication[1], it was indicated that the variations in growth response of vitamin A-deficient rats to carotene dissolved in different oils may be due to the difference in vitamin E contents of the oils. The effect of equalizing the level of tocopherol in the supplements has since been studied and the results found to support the explanation.

Young rats were depleted of vitamin A reserves on a diet consisting of 68 per cent sucrose, 18 per cent extracted casein, 10 per cent brewers' yeast and 4 per cent Osborne and Mendel salt mixture, and supplemented with 1 μgm. of calciferol a week. When symptoms of deficiency were observed, the rats were divided into groups and given the supplements of carotene and tocopherol, six days in the week, as stated in the accompanying table. The fæces of the rats were collected for fifteen days, and the excreted carotene determined by the method of Ramasarma and Hakim[2].

The vitamin E contents of the groundnut, olive and coco-nut oils used in the experiment, determined by a modification of Moore's procedure[3], were 386, 175 and 0 μgm. per gm. respectively. It may be seen that the total vitamin E ingested by rats in groups *G*, *O* 2 and *C* 3 was practically the same, namely, 38·6 μgm. daily, as also in groups *O* 1 and *C* 2, namely, 17·5 μgm. daily.

Group	No. of rats	Supplements	Gain in wt. 3 weeks (gm.)	Gain in wt. 5 weeks (gm.)	Carotene excreted %
G	6	1 μgm. carotene in 100 mgm. groundnut oil	16	22	7
O 1	6	1 μgm. carotene in 100 mgm. olive oil	12	16	0
O 2	6	1 μgm. carotene and 21·1 μgm. α-tocopherol in 100 mgm. olive oil	14	20	0
C 1	5	1 μgm. carotene in 100 mgm. coco-nut oil	4	7	0
C 2	6	1 μgm. carotene and 17·5 μgm. α-tocopherol in 100 mgm. coco-nut oil	9	13	0
C 3	6	1 μgm. carotene and 38·6 μgm. α-tocopherol in 100 mgm. coco-nut oil	14	17	trace

The control groups of rats given the different oils, and one group on tocopherol in coco-nut oil, declined in weight and died.

The results show that the wide variations in growth-response to 1 μgm. of β-carotene in groundnut, olive and coco-nut oils were reduced when pure α-tocopherol was added to the oils low in tocopherol, and the total intake of vitamin E thus equalized. The slight persistent difference might be due to the occurrence in the oils of other isomeric tocopherols which are more efficient antioxidants than α-tocopherol[4].

Gridgeman[5] failed to confirm the vitamin A-E synergy, but the results given above support Hickman's[6] conclusions. Experiments with other dosage levels of tocopherol are in progress.

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Frost Injury Simulating Virus Disease Symptoms on Potato Foliage

THE production of virus-free seed potatoes has been a matter of increasing interest in the British Isles during recent years. The methods of building up healthy stocks originally adopted in Ireland and now being favoured elsewhere consist, briefly, in the scientific testing of selected plants in the glass-house and the subsequent propagation of proved healthy units in isolation in the field. Foundation stocks produced in this manner are distributed to the growers, whose crops are subject to a rigid system of inspection before being certified for seed purposes.

In the working of such a scheme, not the least difficult part is that of the potato inspector, who must diagnose virus infection in the field; and it is in this connexion that we wish to direct attention to the effects of frost on potato foliage. The majority of agriculturists are familiar with the type of injury caused by late spring frosts, such as occurred in April and May of this year; and it is probable that most potato inspectors can also recognize the after-effects of such frosts although these may not be obvious until four to six weeks after the damage has occurred. These effects have been described by Murphy and McKay in a previous publication[1]. Little appears to be known, however, regarding the possible damage to potato foliage caused by the dropping of night temperatures below freezing point during June and early July. So far as we are aware, the only previous reference to such injury is that by Mac-Millan[2], who describes the development of necrotic spots on the tops of potato plants due to sudden cooling at night during summer. Symptoms of this type have not been observed by us, but evidence of a circumstantial character has been accumulating which suggests that cold nights in early summer are liable to produce other effects which may be mistaken for virus disease symptoms. As in the case of late spring frosts, it would appear that these effects may show up almost immediately, or their development may be delayed until leaves which are still folded at the critical period become fully expanded. A few instances will serve to illustrate this point.

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