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7316 P

Protection Afforded by Certain Vegetable Oils against Nutritional Encephalomalacia of Chicks.*

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For several years, attempts have been made to protect chicks against nutritional encephalomalacia¹ (1) by supplementing Diet 108† with various natural foodstuffs; (2) by varying the proportion of the ingredients. A summary of these experiments is given in Table I.

Although there have been indications that the addition of certain foodstuffs such as wheat, corn, lettuce, spinach and grass conferred partial protection, the results have been by no means consistent. Various modifications in the proportion of the mineral and organic ingredients of Diet 108 have likewise failed to induce complete protection. It has been noted that reduction of the lard content regularly lowers the incidence of the disease, but even complete omission of lard from the diet does not give absolute protection. This indicates that the disease is not due primarily to toxicity of the lard.

When certain vegetable oils were substituted for lard in Diet 108, all the chicks remained free from the disease. Experiments demon-

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¹ Pappenheimer, A. M., and Goettsch, M., *J. Exp. Med.*, 1931, **53**, 11; 1933, **57**, 365.

† Diet 108 has the following composition:

Casein	% 20.5	Cod liver oil	% 2.0
Cornstarch	20.0	Yeast	5.0
Lard	21.0	McCullum salts	6.5
Skimmed milk powder	15.0	Paper pulp	10.0

TABLE I.

Diet	No. of chicks	No. with microscopic lesions	% microscopic lesions
Natural foods—cereals, milk products, minerals, yeast, cod liver oil	166	2	1.2
Same diets, autoclaved 6 hours 120°, with and without added yeast	38	0	0.0
Diet 108	271	164	60.0
Diet 108 with greens			
Lettuce, 2-6 gm. daily per chick	58	10	17.0
Spinach, 5 " " " "	28	3	11.0
Grass, 2-5 " " " "	40	4	10.0
Cabbage, 5 " " " "	14	8	57.0
Dried alfalfa meal, 10%†	29	17	58.0
Diet 108 with cereals and cereal products†			
Whole wheat, 20%	104	20	19.0
Wheat sprouts, 5 gm. daily per chick	31	5	16.0
Wheat products, equivalent to 40% wheat	100	46	46.0
Yellow corn, 20%	16	3	19.0
Polished rice, 25%	13	10	77.0
Diet 108 with animal tissues and products†			
Meat scraps, 20%	15	11	73.0
Beef liver, 5 gm. daily per chick	15	9	60.0
Calf brain, 0.5-5 gm. daily per chick	75	42	56.0
Egg yolk, 1 cc. daily per chick	15	4	27.0
Lecithin	17	9	53.0
Changes in the amounts of the ingredients present in Diet 108†			
Yeast, 20%	8	8	100.0
Cod liver oil omitted, chicks irradiated; in one diet butter added	42	25	60.0
Minerals increased to equal value of natural foods diet	21	14	66.0
CaCO ₃ added to improve Ca/P ratio	34	12	35.0
Skimmed milk omitted	41	10	24.0
Change in lard-cornstarch ratio:			
Per cent lard Per cent cornstarch			
0.0 53.4	28	8	29.0
3.0 45.0	17	4	25.0
21.0 20.0 (Diet 108)	271	164	60.0
33.7 0.0	15	8	57.0

† Diets prepared so as to maintain constant nutritive ratio.

TABLE II.

Diet	No. of chicks	No. with microscopic lesions	% microscopic lesions
Substitution of vegetable oils for lard in Diet 108			
Wesson oil, cotton-seed	13	0	0.0
Crisco, hydrogenated cotton-seed oil	28	0	0.0
Mazola, corn-oil	30	0	0.0
Peanut oil	14	0	0.0
Olive oil	14	3	21.0

strating this are presented in Table II. Thus far Crisco, Wesson Oil, Mazola and peanut oil at the level of 20% have afforded com-

plete protection. Olive oil has been less efficacious. Fractionation of these oils is now being carried out in the attempt to gain further knowledge as to the nature of the protective factor.

7317 C

Experiments on Vitamin G Concentration and Possible Supplementary Relationships with the Vitamin G Deficient Diet.

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Attempts to concentrate the vitamin G of food materials^{1, 2, 3} before completion of the work here reported, have been complicated by the postulation of a multiplicity of factors in vitamin G.⁴⁻¹⁴ While the question of this possible multiple nature of the vitamin still remains very unsettled, much progress has been made in the concentration of the vitamin.^{15, 16, 17} The present paper reports additional evidence of the existence of some unknown variant in vitamin G research and describes a method of concentration of vitamin G which is being used as an initial procedure in the subsequent concentration work of Booher.¹⁷

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