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Avitaminosis. VIII. Effect of Vitamin B Deficiency on Concentration of Non-protein Nitrogen of Blood.*

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Since during advanced stages of vitamin B deficiency there is considerable tissue catabolism, it was thought of interest to investigate if in this avitaminosis there are any significant changes in the non-protein constituents of the blood of the albino rat.

The total non-protein nitrogen of the blood was studied in 8 pairs of rats on diets deficient in the vitamin B complex and in 2 pairs on rations deficient only in vitamin B. Weekly determinations were made. Litters were restricted to the same plane of nutrition as the pathological animals but in addition received either the vitamin B complex or vitamin B in the form of dehydrated Northwestern baker's yeast. In addition, 3 sets of animals were studied in groups of 4. The first one of each group received the vitamin B deficient diet (vitamin G having been supplied by autoclaved N. W. yeast); a litter mate received vitamin B but was restricted to the same amount of food and water as the pathological animal; a third litter mate received the same ration as the second, but water *ad libitum;* and the fourth litter mate received the same diet as the second, and food and water *ad libitum.* In these animals the concentration of the non-protein nitrogen, urea, and uric acid of the blood were determined once weekly.

The age of the animals was 50 to 68 days. The weight was from 65 to 91 gm. and the experimental period lasted from 14 to 155 days.

Summarizing the results on the vitamin B complex, there was an average concentration of 39.7 mg. non-protein nitrogen per cent in the pathological animals and 37.7 mg. per cent in the controls receiving vitamin B, but on the same plane of nutrition as the avitaminotic rats.

In the uncomplicated vitamin B groups there was a concentration of 46.7 mg. non-protein nitrogen per cent in the pathological animals as compared with 44.6 mg. per cent in the restricted controls. It is thus apparent that the rise of non-protein nitrogen in

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the blood of vitamin B deficiency in the albino rat was found to be too small to be considered of any significance, neither was there any appreciable rise in the concentration of urea nor uric acid.

It was rather surprising to find that losses to the extent of 30% in body weight did not produce any greater increase in concentration of non-protein nitrogen of the blood than 8 to 10%.

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Avitaminosis. IX. Influence of Vitamin A Deficiency on Albumin-globulin Ratio of the Blood of Albino Rat.*

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Since it is now generally recognized that infection accompanies vitamin A deficiency,[1] and since it is claimed that during infection there is a change in the albumin-globulin ratio of the blood,[2] due to the rise of the globulins, it was thought of interest to investigate if in this avitaminosis there is produced a shift in the albumin-globulin ratio of the blood of the albino rat.

A total of 18 animals were used in this study, 12 pathological and 6 controls. The micro methods used for the determinations of albumin and globulin were those perfected by Greenberg.[3] Weekly determinations were made for periods ranging from 63 to 102 days. The animals were 49 to 61 days old when started on the experiment and weighed 82 to 127 gm.

Summarizing all of our results for the entire experimental periods, the pathological animals showed an albumin-globulin ratio of 2.0 and the controls a ratio of 1.7. Only 4 animals out of the 12 pathological showed any considerable fall in the albumin-globulin ratio during the terminal stages of the avitaminosis, as indicated by a ratio of 1.3 in 2 animals and a ratio of 1.5 in 2 others.

From the character of our results we conclude that the albumin-globulin ratio cannot be used as an index of infection in vitamin A deficiency.

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[1] Green, H. N., and Mellanby, E., *Brit. Med. J.*, 1928, **3587**, 691. Tyson, M. D., and Smith, A. H., *Am. J. Path.*, 1929, **5**, 57.

[2] Howe, P. E., *Physiol. Rev.*, 1925, **4**, 439.

[3] Greenberg, D. M., *J. Biol. Chem.*, 1929, **82**, 545.