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Influence of the Maternal Diet on Concentration of Hemoglobin of Nursing Young of Albino Rat.*

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In a recent communication[1] we have reported on "Blood Formation of the Albino Rat on a Standard Dietary Regime", of the following composition: whole wheat, 25; rolled oats, 26; yellow corn, 25; oil meal, 15; commercial casein, 5; cod liver oil, 1; $CaCO_3$, 0.5; NaCl, 0.5; and a liberal supply of whole milk daily. On that ration, designated as stock diet 1, we found the concentration of hemoglobin of nursing baby rats appreciably below that reported by Williamson and Ets.[2] We are now finding considerably higher values on a different type of diet, designated as ration 1145, of the following composition: casein (purified) 20; dehydrated baker's yeast (Northwestern), 10; McCollum's salt mixture No. 185, 4; butter fat, 5; and dextrin, 61. Our findings are submitted graphically in Chart I.

All the lactating mothers were raised on stock diet 1. During the reproduction period the females were divided into 3 groups. One group was mated and allowed to rear the young on stock diet 1; another group was transferred during the later part of pregnancy to ration 1145; and the third group was transferred to ration 1145 on the date of the birth of young.

The curve of hemoglobin concentration of nursing young on maternal stock diet 1 represents 416 determinations.[1] For our work on maternal diet 1145 we made 432 determinations, 18 young having been taken for each age. Since we found no significant increase in the concentration of hemoglobin of the nursing young, whose mothers received ration 1145 during the latter part of gestation compared with that of the nurslings whose mothers received the same diet on the date of birth of the litters, we are showing only the figures of the latter group.

In this study we have also investigated the effect of the abovementioned 2 types of maternal diets on the concentration of erythrocytes of nursing young of the albino rat. We found that, while the

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[1] Sure, B., Kik, M. C., and Walker, D. J., *J. Nutr.*, 1929, i, 299.

[2] Williamson, C. S., and Ets, H. N., *Am. J. Physiol.*, 1926, lxxvii, 480.

concentration of red blood corpuscles is somewhat higher on ration 1145 than on stock diet 1, the differences are relatively small compared with the differences in the concentration of hemoglobin of nurslings on these 2 rations.

On ration 1145 we have found marked variations in growth of nursing young. Recently[3] a number of litters showed greater

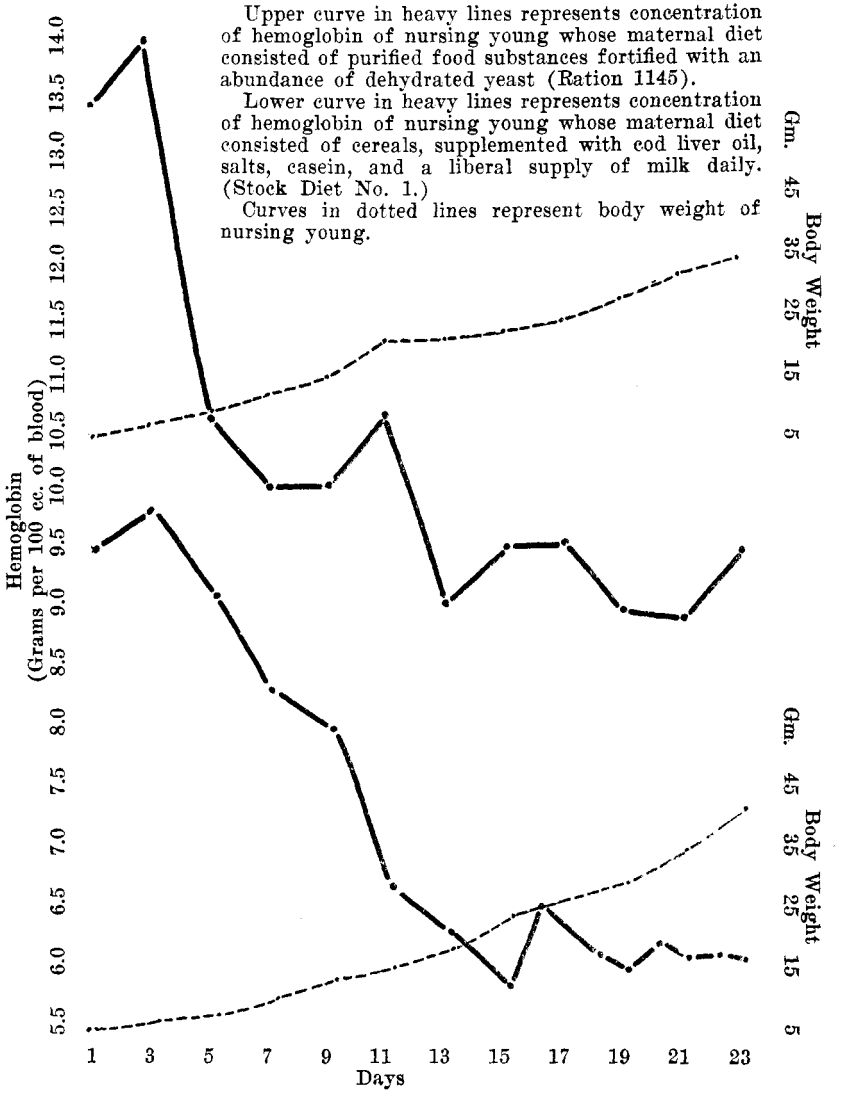
CHART I.

Effect of the Maternal Diet on the Concentration of Hemoglobin of Nursing Young of the Albino Rat.

Upper curve in heavy lines represents concentration of hemoglobin of nursing young whose maternal diet consisted of purified food substances fortified with an abundance of dehydrated yeast (Ration 1145).

Lower curve in heavy lines represents concentration of hemoglobin of nursing young whose maternal diet consisted of cereals, supplemented with cod liver oil, salts, casein, and a liberal supply of milk daily. (Stock Diet No. 1.)

Curves in dotted lines represent body weight of nursing young.



[3] Sure, B., Kik, M. C., and Walker, D. J., *J. Biol. Chem.*, 1929, in press.

growth on such a maternal diet than the nursing young reared on stock diet 1. The nursing young represented in this study on maternal ration 1145, while growing at a more rapid rate during the first half of the lactation period, showed inferior growth during the later part of lactation than the nurslings on maternal stock diet 1. The young of the former group, nevertheless, show higher concentration of hemoglobin throughout the nursing period than the young of the latter group.

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The Specific Conductivity of Protozoan Cultures.

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It is an established fact that rhythmical fluctuations of protozoan fauna occur in ponds and laboratory cultures. A number of factors, such as food and oxygen supply, hydrogen ion concentration, temperature, etc., have been measured and attempts made to explain the abundance or scarcity of protozoan forms as being controlled by some one of these factors. Darby[1] has recently presented a thorough review of the subject.

In the present study, one of the factors which seems to have been neglected has been studied. The specific conductivity of several types of laboratory cultures has been measured daily over a considerable period of time. The cultures were made up in duplicate sets with boiled pond water. Cultures I-A and I-B contained dry hay; cultures II-A and II-B had boiled hay and cultures III-A and III-B had no hay at all. All cultures were inoculated from the same stock and kept in the laboratory.

The accompanying graph shows the results obtained. During the first 10 days after the cultures were made, the specific conductivity fluctuated to a considerable degree. From this time on, the points seem to suggest a rhythmical fluctuation such as suggested by the solid lines. Cultures III-A and III-B which had no hay in them and in which the protozoa soon disappeared, showed a specific conductivity which was very low and very constant. Cultures I-A and

[1] Darby, H. H., 1929, *Arch. f. Protist.*, B. 65, S. 1.