

6411

**Avitaminosis XIII. Effect of Vitamin A Deficiency and Vitamin D Deficiency on Differential Leucocyte Count of the Albino Rat.\***

BARNETT SURE AND KATHRYN S. BUCHANAN.

*From the Department of Agricultural Chemistry, University of Arkansas, Fayetteville.*

*Vitamin A Deficiency.* Forty-nine rats were employed, 30 to 50 days of age, each animal weighing 50 to 86 gm. Of these, 31 were placed on a diet satisfactory in every respect with the exception of vitamin A, and 18 served as controls. The experimental period lasted 30 to 70 days. Various stages of the avitaminosis were produced, ranging from loss of weight with or without accompanying incipient ophthalmia to severe ophthalmia associated with pneumonia. Our results on the differential leucocyte count in vitamin A deficiency are essentially in accord with the recent findings of Turner and Loew,<sup>1</sup> namely, that, as the disease progresses in severity there is a relative increase of polymorphonuclear leucocytes and a corresponding decrease in lymphocytes in the majority of pathological animals compared with the litter mate controls. The extent of such relative polymorphonuclear leucocytosis and corresponding lymphopenia is 10 to 30%. What we are unable to explain, however, is why a number of animals that are apparently in advanced stages of this avitaminosis show no significant changes in the differential leucocyte count.

Total leucocyte counts were made on 6 pathological animals and on 6 controls. The extent of variation on the same control animals was so great that no noteworthy influences can be ascribed to the vitamin A deficiency. In this respect our findings are not in agreement with those of Turner and Loew who report higher values for animals suffering from this avitaminosis. No significant differences were observed in the monocyte, basophil or eosinophil counts between the pathological and control animals.

*Vitamin D Deficiency.* For the vitamin D work 42 animals were employed, 31 of which were placed on Steenbock and Black's ricketic diet,<sup>2</sup> and 11 of which served as controls. The animals

---

\* Research paper No. 270, Journal Series, University of Arkansas.

<sup>1</sup> Turner, R. G., and Loew, E. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **28**, 506.

<sup>2</sup> Steenbock, H., and Black, A., *J. Biol. Chem.*, 1925, **64**, 263.

were 29 to 48 days of age when placed on the experiment and each weighed 40 to 50 gm. The experimental period ranged from 30 to 35 days.

A summary of all the results discloses that in experimental rickets produced on diets high in calcium and low in phosphorus, and deficient in vitamin D, no disturbance takes place in the differential leucocyte count. No observations were made on the total leucocyte count in this avitaminosis.

## 6412

### Avitaminosis XII. Influence of Vitamin B Deficiency on Differential Leucocyte Count of the Albino Rat During Lactation.\*

BARNETT SURE AND KATHRYN S. BUCHANAN.

*From the Department of Agricultural Chemistry, University of Arkansas, Fayetteville.*

It was reported that in vitamin B deficiency of the weaned albino rat, there is produced a relative lymphopenia and corresponding polymorphonuclear leucocytosis<sup>1</sup> which is due to the *specific* effect of this avitaminosis<sup>2</sup> unrelated to the plane of nutrition.

In this investigation a study was made of the influence of vitamin B deficiency on the differential leucocyte count of the lactating albino rat and its nursing young. Forty-seven mothers and litters were employed, 21 of which were pathological and 26 of which served as controls. The biological methods used have been previously described.<sup>3</sup> The experiments were set out in pairs and triads, so that the results could be interpreted as due to inanition or to the vitamin B deficiency *per se*.<sup>3</sup>

In lactation studies of the rat complicating factors arise that are not encountered in growth. For instance, since it is impossible to obtain sufficient milk from nursing rats for biological studies, the criterion of lactation performances is the character of growth of the nursing young, which is correlated with a limiting factor in

---

\* Research paper No. 269, Journal Series, University of Arkansas.

<sup>1</sup> Sure, B., Thatcher, H. S., and Walker, D. J., *Arch. Path.*, 1931, **11**, 413.

<sup>2</sup> Sure, B., and Walker, D. J., *Arch. Int. Med.*, 1932, **49**, 405.

<sup>3</sup> Sure, B., *J. Biol. Chem.*, 1932, **97**, 133.