

Vitamin B₆ and Erythropoiesis in the Rat.* (22402)

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Vit. B₆ deficiency has been shown to result in anemia in several species including dogs, swine, and chicks(1). The anemia observed has been microcytic and hypochromic. Quite recently it has been reported that vit. B₆-deficient rats exhibit a decreased mean corpuscular hemoglobin and a slightly increased red cell count(2). In the latter experiments peripheral lymphocytes were found to be reduced in the vit. B₆-deficient rats. The data to be given in the present report indicate that vit. B₆ is definitely required for normal hemoglobin production by the rat.

Methods. Weanling Sprague-Dawley rats of both sexes were fed a basal vit. B₆-deficient diet consisting of vitamin-free casein, 18.6 g; sucrose, 67.4 g; lard, 8.0 g; cod liver oil, 2.0 g; salt mix (*J. Nutrition*, v14, 273), 4.0

TABLE II. Influence of Vit. B₆ Deficiency on Peripheral Leucocytes of Rats.

Animals	Total leucocytes	Lymphocytes	Neutrophils
	Thousands/ μ l		
Control	12.5	11.0	1.3
B ₆ -deficient	23.5	6.5	16.6
P*	<.01	<.01	<.01

* See footnote to Table I.

mean cell volume, and mean cell hemoglobin. The most striking change due to vit. B₆ deficiency was the reduction in mean cell hemoglobin. These data indicate that vit. B₆ is necessary for hemoglobin synthesis by the rat.

As shown by the data in Table II, vit. B₆ deficiency resulted in a significant lymphopenia and a striking increase in peripheral neutrophils.

TABLE I. Influence of Vit. B₆ Deficiency on Peripheral Erythrocytes of Rats.

Animals	Erythrocytes, millions/ μ l	Hematocrit, ml/100 ml	Hemoglobin, g/100 ml	Mean cell vol, μ^3	Mean cell hemoglobin, $\mu\mu$ g
Control	6.95	51	14.5	73	20.9
B ₆ -deficient	8.75	48	11.3	55	12.9
P*	<.01	<.1, >.05	<.01	<.01	<.01

* Probability that differences between control and B₆-deficient means are due to chance.

g; choline chloride, 0.1 g; inositol, 10 mg; riboflavin, 0.8 mg; thiamine chloride, 0.5 mg; Ca pantothenate, 2 mg; nicotinic acid, 2 mg; 2-methyl-1, 4-napthoquinone, 0.44 mg. The animals were each given 3 mg of α -tocopherol acetate 2 times weekly. Control rats received this same diet supplemented with 10 mg of pyridoxine per kilo of diet. The animals were fed these diets for 15 weeks at which time complete blood counts were made on tail blood. There were 6 rats per group and the data were analyzed statistically by the "t" test.

Results. The data in Table I show that vit. B₆ deficiency resulted in an increase in red cell count and a decrease in hemoglobin,

These data taken in conjunction with other reports in the literature demonstrate that the rat must be added to the list of animals requiring vitamin B₆ for normal erythropoiesis.

Summary. 1) Severe vit. B₆ deficiency in the rat resulted in an increased red cell count and in a reduction in hemoglobin, mean cell volume, and mean cell hemoglobin. The most striking effect was the reduction in mean cell hemoglobin in the deficient rats. The B₆-deficient rats exhibited lymphopenia and granulocytosis. 2) The data show that the rat must be added to the list of animals requiring vit. B₆ for normal hematopoiesis.

1. Cartwright, G. E., *Blood*, 1947, v2, 111.

2. Batchen, J. M., Cheesman, E. M., Copping, A. M., and Trusler, A. D., *Brit. J. Nutr.*, 1955, v9, 49.

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