

### VITAMIN B<sub>12</sub> CONTENT OF THE RAT LIVERS IN ANEURIN AND RIBOFLAVIN DEFICIENCIES

A study of the vitamin B<sub>12</sub> content of the livers of different animals under normal conditions reveals a comparatively low amount of the vitamin in the livers of rats.<sup>1</sup> In this note is reported our work on the vitamin B<sub>12</sub> activity of livers of rats in aneurin and riboflavin deficiencies.

White albino rats (males) weighing about 50 g. were used as experimental animals. The experiment was performed in two batches of 48 rats each. Each batch of rats was divided into 4 groups—two for the control and experimental animals in aneurin deficiency and two for those in the riboflavin deficiency. The rats were separated in individual cages and were fed *ad lib* on the purified basal diet.<sup>2</sup> In addition, the aneurin group of rats received 10 per cent. autoclaved brewer's yeast and the riboflavin group of rats received an equal amount of alkali autoclaved brewer's yeast. Each rat of the control groups received aneurin, riboflavin calcium pantothenate and pyridoxine to the extent of 20, 45, 100 and 20 µg. respectively per day. The experimental animals in aneurin and riboflavin deficiencies received all these vitamins except aneurin and riboflavin respectively. Severe symptoms of aneurin deficiency were observed in about 4 weeks and those of riboflavin deficiency in about 8 weeks. The deficient and control animals were then sacrificed simultaneously. The livers were removed, weighed and analysed for vitamin B<sub>12</sub> activity by the microbiological method using *Leatobacillus leichmannii*.<sup>3-5</sup> The results are given in Table I.

TABLE I  
Mean vitamin B<sub>12</sub> content of control and deficient rats

Group	µg./g. liver	Batch
1 <i>Aneurin</i>		
(a) Control	.. 55.45	I-(8)*
	53.76	II-(8)
(b) Deficient	.. 24.20	I-(7)
	20.46	II-(6)
2 <i>Riboflavin</i>		
(a) Control	.. 54.56	I-(10)
	52.60	II-(11)
(b) Deficient	.. 32.79	I-(9)
	41.44	II-(7)

\* The figures in the parenthesis refer to the number of animals used in the determination.

On applying the 't' test it is seen that the difference in the mean values of vitamin B<sub>12</sub> in the control and deficient animals is significant at 5 per cent. level of confidence. It appears that a deficiency either of aneurin or riboflavin leads to a deficiency of vitamin B<sub>12</sub> in the livers of rats. Several workers have reported such definite interrelationships between other members of the B group of vitamins.<sup>2,6,7</sup> The above results suggest that vitamin B<sub>12</sub> is probably interrelated to aneurin and riboflavin. Work is in progress to study this aspect of the problem in detail. A detailed account of all the work will be published elsewhere.

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1. Shenoy, K. G. and Ramasarma, G. B., unpublished data.
2. Bhagwat, K. and Devi, P., *Biochem. J.*, 1949, **45**, 1, 32.
3. Thompson, H. T., Dietrich, L. S. and Elvehjem, C. A., *J. Biol. Chem.*, 1950, **184**, 175.
4. Loy, H. W. (Jr.), Haggerty, J. F. and Kline, O. L., *J. Assoc. Official Agr. Chem.*, 1952, **35**, 161.
5. *Third Suppl. to U.S.P.*, **14**, p. 15.
6. Sure, B. and Ford, Z. W. (Jr.), *J. Nutri.*, 1943, **26**, 659.
7. Singher, J. *Bio elat l. Chem.*, 1944, **154**, 69.

### FEEDING WATER-MISCIBLE VITAMIN A TO DAIRY CATTLE

It has been reported by Sobel and co-workers<sup>1,2</sup> that the oral administration of aqueous dispersion of vitamin A to lactating animals produces milk with higher vitamin A potency than those fed with oil-soluble vitamin A. Investigations at this Institute<sup>3</sup> revealed that the water miscible form of vitamin A used for fortifying milk remained practically in the aqueous phase and if the milk was mechanically separated, most of the water miscible vitamin A could be recovered in the skim milk. It is not known whether the aqueous form of vitamin A fed to cattle will have any effect on the vitamin A content in the aqueous phase of the milk. Some work has been done in this direction and the results are presented here.

After a preliminary period of 1 week when the animals were maintained on ragi straw alone as roughage, 100,000 i.u. of water miscible vitamin A was fed daily to each animal as