

TABLE I.
Summary of Results.

Exposure to I ¹³¹ , days	No. of mice	Dose, millicuries per kg	Approx. % thyroid destruction	Approx. % parathyroid destruction
2	2	20-23	0	0
2	1	53	90	75
3	6	3-5	10	0
3	4	17-18	75	25
3	4	30-35	80-90	75
3	3	50-55	100	95
24	8	3-5	25-50	10
24	4	18-22	100	50
120	4	3-4	90	100

Summary. Dosages of I¹³¹ from 3 to 50 millicuries per kilogram were given to young mice on a normal diet. Higher dosages produced complete thyroidal destruction within a few days. Lower dosages permitted survival of some thyroidal epithelium in the

isthmus and cranial apex of the thyroid for as long as 120 days after injection, but resulted in loss of the parathyroids. Lesions were noted in the tracheal epithelium with all dosages, and in the recurrent laryngeal nerve with higher dosages.

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Thiouracil and Conversion of Carotene to Vitamin A Measured by Liver Storage in the Rat.*

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In a recent report, Canadell and Valdecasas¹ fed rats, which previously were on a vitamin A-free diet with thiouracil administered in the drinking water, 60 γ of carotene per week. The administered carotene was unable to relieve the ocular symptoms produced by a vitamin A deficiency. However, these symptoms were alleviated if small amounts of thyroid powder were administered with the carotene or vitamin A was fed to the thiouracil-treated animals. Their interpretation of this phenomenon was that it involved an inhibition of carotenase.

If this is true, then the feeding of carotene to vitamin A deficient-animals previously treated with thiouracil should produce little or no vitamin A in the liver. Therefore, this experiment was attempted, and a preliminary report of the results obtained is presented.

Twenty-six rats were placed on a vitamin A-low diet when they were 10 days old. When they reached a body weight of 43 g, they were divided into 2 groups. One group was continued on the same diet for 4 weeks while the second group received a similar diet to which 0.25% of thiouracil had been added. All rats were continued for an additional 2 weeks on identical diets except that they were made vitamin A-free by replacing the commercial casein with vitamin A-free test casein

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¹ Canadell, J. M., and Valdecasas, F. G., *Experientia*, 1947, **3**, 35.

TABLE I.
Body Weight and Vitamin A Content of Young Rats Receiving a Vitamin A-free Diet With or Without Thiouracil at Periods of 36 Hours to 7 Days After Feeding 348 γ of β -carotene.

Carotene fed, γ	Rats administered diet containing 0.25% thiouracil			Control rats receiving no thiouracil		
	No. of rats	Body wt, g	Vit. A content per liver,* I.U.	No. of rats	Body wt, g	Vit. A content per liver,* I.U.
0	6	83	(4.5)†	6	156	(6.7)†
348	8	86.5	56.7 $\pm$ 24.4 (11.4-232)‡	6	143	56.2 $\pm$ 10.1 (17.9-91.5)‡

* Includes standard error of the mean calculated as follows:

$$\sqrt{\Sigma d^2/n} / \sqrt{n}$$

where "d" represents the deviation from the mean and "n" is the number of observations.

† Not considered as vitamin A since no fading blue color developed.

‡ Range of results.

(General Biochemicals, Inc.). Some of the animals in each group received a single oral dose of a solution of β -carotene in cottonseed oil containing 348 γ while the remaining rats, which served as controls, received cottonseed oil. The animals were sacrificed at 36 hours, 5 days or 7 days. Since the vitamin A levels in the different groups did not show any significant trend with time, the results obtained with animals sacrificed at 36 hours, 5 or 7 days have been averaged together. Vitamin A was extracted from the livers by the procedure employed by Mattson, Deuel and Mehl.² The determination of vitamin A was by the Carr-Price method using a Coleman Junior spectrophotometer. The results are summarized in Table I.

It would appear from these experiments that a thiouracil-treated rat can convert carotene to vitamin A and store this product in

the liver when fed 348 γ of carotene. However no results on the animals' ability to utilize this stored vitamin A are presented. Drill and Truant³ in a recent paper, using thyroidectomized animals, could not prevent or alleviate ocular symptoms by injecting 10 γ of carotene per day. However, Remington *et al.*⁴ found that an oral dose of 0.6 γ of carotene per day was able to bring about a cure of the eye symptoms of thyroidectomized rats within 7-9 days. No difference between the effectiveness of vitamin A and carotene was noted in these experiments.

Experiments are now under way to demonstrate the lowest level of carotene and vitamin A which must be fed to a thiouracil-treated animal to alleviate the eye symptoms from vitamin A deficiency.

³ Drill, V. A., and Truant, A. P., *Endocrinology*, 1947, **40**, 259.

⁴ Remington, R. E., Harris, P. L., and Smith, C. L., *J. Nutrition*, 1942, **24**, 597.

² Mattson, F. H., Mehl, J. W., and Deuel, H. J., Jr., *Arch. Biochem.*, 1947, **15**, 65.