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Physiology of Pyrimidines. VIII. Metabolism of Isobarbituric Acid in the Rabbit.

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As a preliminary to a study of the origin of ethereal sulfates in the rabbit, we thought it worth while to investigate the metabolism of isobarbituric acid in this species. In the adult dog[1] and in man[2] this pyrimidine is partly broken down to urea, partly conjugated with sulfuric acid.

Four adult rabbits were placed in metabolism cages, and kept on a diet consisting of equal parts of alfalfa and oats. The amount of food given each animal was 10 gm. less than that eaten at will. This was found to be sufficient to permit a slight gain in weight over a period of 3 months. The animals were allowed to drink water *ad libitum*. The freely voided urine was collected every 24 hours.

TABLE I.
Metabolism of Isobarbituric Acid in the Rabbit.

	Day	Urine volume cc.	Total N gm.	Urea N gm.	Total S gm.	Inorganic S gm.	Ethereal S gm.	Neutral S gm.
Rabbit No. 1	1	158	1.76	1.17	0.203	0.133	0.012	0.058
	2	163	1.79	1.24	0.171	0.123	0.008	0.040
	3	165	1.82	1.22	0.190	0.128	0.011	0.051
	4	166	1.78	1.24	0.205	0.136	0.012	0.057*
	5	171	1.96	1.50	0.202	0.086	0.058	0.058
	6	158	1.70	1.19	0.201	0.126	0.014	0.061
	7	162	1.79	1.10	0.196	0.131	0.013	0.053
Rabbit No. 2	1	113	1.45	1.30	0.116	0.076	0.010	0.030
	2	121	1.43	1.11	0.121	0.078	0.012	0.031
	3	103	1.44	1.19	0.120	0.083	0.011	0.026*
	4	112	1.66	1.36	0.150	0.043	0.069	0.038
	5	133	1.31	1.04	0.148	0.091	0.016	0.041
	6	127	1.44	1.23	0.143	0.094	0.009	0.040
Rabbit No. 3	1	178	1.32	0.87	0.151	0.095	0.012	0.044
	2	153	1.29	0.91	0.154	0.098	0.013	0.043
	3	146	1.21	0.90	0.151	0.105	0.011	0.035*
	4	160	1.52	1.11	0.164	0.027	0.093	0.044
	5	178	1.31	0.90	0.146	0.099	0.009	0.038
	6	153	1.20	0.84	0.121	0.083	0.008	0.030

* 1.5 gm. of isobarbituric acid fed with the food, N = 0.33 gm.

1 Cerecedo, L. R., *J. Biol. Chem.*, 1930, **88**, 695.

2 Stekol, J. A., and Cerecedo, L. R., *J. Biol. Chem.*, 1933, **100**, 653.

Isobarbituric acid was prepared according to Davidson and Baudisch.[3] The purity of the compound was checked by analysis.

The following analytical methods were used: Total N, Kjeldahl; urea, Van Slyke's gasometric method[4]; inorganic and ethereal sulfur, Folin's method[5]; total sulfur, Denis' modification of Benedict's method.[6]

Isobarbituric acid was fed altogether 9 times to rabbits. Three representative experiments are given in Table I. We find a rise in the urea output, a drop in the inorganic sulfur fraction, and a corresponding increase in the ethereal sulfates. These observations indicate that the metabolism of isobarbituric acid in the rabbit follows the same path as in the adult dog and in man.

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Serum Phosphatase in Normal Young Rabbits.

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In connection with studies on certain familial bone abnormalities of the rabbit, the sera of animals presenting the deformities under investigation were analyzed for their phosphatase content. For comparative purposes similar determinations were made on a group of normal animals, and these normal findings form the basis of the present report.

The rabbits varied in age from 15 to 71 days, with a mean age of 39.3 ± 15.3 days. They were all vigorous, healthy young, with no clinical evidence of bone lesions, and were derived from lines unrelated to the group with bone pathology. All were caged with their mother or foster-mother. The diet consisted of maternal milk supplemented in varying degrees depending on the age of the animal by a mixture of grains and grain products, with alfalfa, mineral salts and a molasses binder. The technique employed in the serum phosphatase determinations was that described by Bodansky.* [1] Except

[3] Davidson, D., and Baudisch, O., *J. Biol. Chem.*, 1925, **64**, 619.

[4] Van Slyke, D. D., *J. Biol. Chem.*, 1927, **73**, 695.

[5] Folin, O., *J. Biol. Chem.*, 1905, **1**, 131.

[6] Denis, W., *J. Biol. Chem.*, 1910, **8**, 401.

* The author wishes to thank Dr. Bodansky for personally demonstrating the technique of this procedure.

[1] Bodansky, A., *J. Biol. Chem.*, 1932, **99**, 97; *ibid.*, 1933, **101**, 93.