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Studies on Iodine Absorption of Serum in Rats Fed on Fat-free Diets.*

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In view of the apparent necessity for unsaturated fatty acids in the diet, it was thought that a preliminary comparison of the iodine absorption of the serum lipids of control rats with that of animals fed on fat-free diets might show significant differences.

The animals were chloroformed and the blood was collected directly from the heart into a test tube, pressure being made on the body to insure maximum collection. The serum was obtained by centrifuging. An alcohol-ether extract of the serum was prepared according to Bloor's method.¹ The iodine absorption was determined according to the method of Rosenmund-Kuhnhen² as modified by Page, Pasternak and Burt.³ Determinations were made directly on the alcohol-ether extract. Eight healthy control animals and 8 fed on a fat-free diet were used. The results obtained (Table I) are expressed in mg. iodine absorbed per 100 cc. serum.

The differences between the two groups are distinct. In fact, the groups are separated so that the highest of the "fat-free" animals does not reach the lowest of the controls. These results are especially significant in view of the fact that the controls are on a relatively low fat diet (McCollum's diet No. 1),⁴ in which the fat is largely from milk. Therefore, the bodies of these animals probably have fats of as low iodine number as any animals on ordinary mixed diets.

This work is being extended to show whether the low iodine absorption of the alcohol-ether extract of the serum of the fat-starved rats is due to smaller amounts of fats or to a lower iodine

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¹ Bloor, W. R., *J. Biol. Chem.*, 1928, **77**, 53.

² Rosenmund, K. W., and Kuhnhen, W., *Z. f. unter. d. Nahr. u. Genuss.*, 1923, **46**, 154.

³ Page, H. H., Pasternak, L., and Burt, M. L., *Biochem. Z.*, 1930, **223**, 445.

⁴ McCollum, E. V., and Simmonds, N., *J. Biol. Chem.*, 1918, **33**, 63.

TABLE I.
Mg. iodine absorbed per 100 cc. serum of normal rats and of rats fed on a fat-free diet.

Normal rats on stock diet* Iodine absorbed	Rats on a fat-free diet** Iodine absorbed
501	330
435	379
670	395
917	271
646	296
583	273
530	277
505	252
Aver. 598	309

*McCollum's diet No. 1.⁴

**550 B + vitamin supplement, Burr and Burr.⁵

number of the fats. The work of Bloor,⁶ Maynard and McCay,⁷ and Bender and Maynard⁸ indicates large drops in the phosphatides, cholesterol and total lipids of the blood when low fat diets are fed. No iodine number of the serum fatty acids is given by these workers.

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Iodine Numbers of Serum Lipids in Rats Fed on Fat-Free Diets.*

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Our preliminary data¹ indicated that the serum from rats fed on fat-free diets absorbed less iodine than the serum from control animals. We have since attempted to determine whether the differences found could be due to smaller amounts of total lipids or to lipids having a lower iodine number.

The alcohol-ether extract of the serum was prepared in the usual manner.² The iodine absorption was determined on the alcohol-

⁵ Burr, G. O., and Burr, M. M., *J. Biol. Chem.*, 1930, **86**, 587.

⁶ Bloor, W. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **28**, 701.

⁷ Maynard, L. A., and McCay, C. M., Cornell University Agricultural Experiment Station, Bull. 543, September, 1932.

⁸ Bender, R. C., and Maynard, L. A., *J. Dairy Sci.*, 1932, **15**, 1.

* This work was supported by grants from the National Live Stock and Meat Board, from the Medical Research Fund and General Research Fund of the University of Minnesota.

¹ Hansen, Arild E., and Burr, George O., *PROC. SOC. EXP. BIOL. AND MED.*, 1933, **30**, 1200.

² Bloor, W. R., *J. Biol. Chem.*, 1928, **77**, 53.