These determinations show that concentrations measured by a depression of 13.0°, presumably the equivalent of 153 atmospheres, may be found in the tissue fluids of apparently normal leaves.

51 (1633)

The carbohydrate-fat ratio in relation to the production of ketone bodies in diabetes mellitus.

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Since relatively large amounts of fats are used in the construction of maintenance diets in the treatment of diabetes mellitus it is important to know the limits within which fat may be employed with safety. The normal composition of fat demands that carbohydrates shall be simultaneously oxidized. Zeller[1] has shown in two normal men and two normal dogs that of the total calories, the protein intake being kept low, 10 per cent. must be yielded by carbohydrate if 90 per cent. arises from fat in order to prevent the production of the ketone bodies. In commenting on these experiments Lusk[2] calls attention to the fact that it is possible that for the proper oxidation of fat, the end product of which is B-oxybutyric acid, the burning of one triose molecule may be necessary for the normal oxidation of one molecule of B-oxybutyric acid. The attempt has been made in this work to establish the proportion of available carbohydrate to fat when ketone bodies appear in the urine.

Diabetic cases are treated as follows: Freed from sugar and acetone body excretion, sugar tolerance ascertained and then the following experiment. The individual is put on a diet having a protein intake that will enable nitrogen equilibrium to be maintained with the fat and carbohydrate given. During different periods the protein intake is kept constant and the amount of carbohydrate and fat are varied isodynamically, the proportion

[1] Zeller, *Archiv. fur Physiologie*, 1914, p. 213.

[2] Lusk, "Science of Nutrition," third ed., pp. 270–271.

of carbohydrate being reduced in proportion to the fat until ketone bodies show a definite increase in the urine.

The following table shows the percentage relationship of fat and carbohydrate and total available carbohydrate in the diet of the patients at the point in the experiment where the ketone body excretion shows a marked increase.

Case No.	Per Cent. of Total Calories Yielded by			Gms. Avail CH.	Gms. Fat.	Ratio.
	Fat.	CH.	Avail. CH.			
101	79	4	14	60	150.6	1 : 2.5
102	87	4	9	25.1	111.0	1 : 4.4
103	78	11	17	40.9	80.4	1 : 1.9
104	87	3	9	31.4	140.1	1 : 4.5
105	84	5	12	25.4	80.5	1 : 3.2
106	83	5	12	25.6	80.1	1 : 3.2
107 non diabetic	89	4	8	51.6	235.3	1 : 4.6
109	87	3	8	28	129.9	1 : 4.0
110	78.1	5.5	15	36.6	84.1	1 : 2.3[4]

[3] Total available carbohydrate calculated by taking 58 per cent. gms. protein and adding to grams carbohydrate.

[4] Case No. 103 re-admitted seven months later.

The results suggest that the ratio of carbohydrate to fat necessary for complete oxidation of the fat may be about the same as Zeller obtained in normals.

52 (1634)

The nutritive value of extra-yeast bread.

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Eleven albino rats were placed upon a diet containing besides inorganic salts and butter fat in adequate amounts, a bread made from white flour in the ordinary manner containing the usual amount of yeast, the liquid used in preparing the dough being half milk and half water.

Another group of eleven rats of the same average weights were placed upon a diet similar to the preceding, except that 5 per cent. of dried yeast was added to the flour and some extra fresh yeast added to raise the dough.