THE DIETARY INTAKE OF A CLASS OF STUDENTS

BY

R. P. COOK, M.B., D.Sc.

(From the Department of Biochemistry, University College,
Dundee)

For the past two years medical, dental, and science students attending the classes in biochemistry here have measured their dietary intake over a period of one week by the log-book method. Admittedly this method is not as accurate as is the weighing method of computing the dietary, but it is simple. Moreover, it is not difficult to persuade students to make notes of the portions of food they have eaten. If the exercise is taken into account in the practical examination it is surprising how co-operative the students become!

It was possible to check, in part at least, the values obtained by measuring the nitrogen excretion on a 24-hour sample of urine. This experiment was carried out by approximately half the members of the class. The main data with regard to the participants in the experiment are as follows:

Number and Sex: 44 males and 14 females (44 were ex-Service men and women).

Age: 17-31 years.

Residence: 35 lived at home, 12 in university hostels, and 11 in lodgings; about 35 took their midday meal in the University Union dining hall.

Health: All were apparently in good health.

Period of Study: The dietaries were carried out for a period of one week between the months of October and December, 1947.

Dietary intake: Each student was provided with explanatory sheets in which were given the approximate weights of portions of the commoner foodstuffs; a separate table gave the composition of portions of the commoner soups. It was recommended that butter, margarine, jam, etc., and milk be set aside as a separate daily ration. A log was kept by the student of the portions of foodstuffs served at the various meals throughout the seven days. The portions were then converted into gramme equivalents of the different foods.

Food Tables: The values in Table I (i.e., composition of the "edible portion" per 100 g.) of "Nutritive Values of Wartime Foods," M.R.C. War Memorandum No. 14, were used for the calculations.

In Table I are given the values obtained by the class. These values are contrasted with those of Widdowson (1936) for men and Widdowson and McCance (1936) for women. The standard deviation has been calculated by the method advocated by Bradford Hill (1942). No values for vitamin A are given in Table I as there was some doubt about the conversion of carotene into vitamin A units. Carrots were a popular article of diet during the period of study, and an apparent average value of approximately 10,000 i.u. of vitamin A a day was obtained.

Bread: The range of consumption per week was for men 22-108 oz. (624-3,060 g.), mean 56.4 (1,599 g.); for women, range 18.5-41 oz. (525-1,162 g.), mean 28.5 (908 g.).

Potatoes: Men, range per week 22.5-98 oz. (636-2,778 g.), mean 53.6 (1,520 g.); women, range per week 22-62.5 oz. (624-1,762 g.), mean 40 (1,134 g.).

Nitrogen Excretion.—As a class exercise the determination of nitrogen in a 24-hour sample of urine is carried out by about half the class of medical students. The Kjeldahl method of estimation was employed, and it was

TABLE I.—Showing Intake of Dietary Constituents for a Group of Students

The values obtained by Widdowson (1936) and by Widdowson and McCance (1936) are shown for comparison

		Males		Females	
		Dundee (44 persons)	W. (63 persons)	Dundee (14 persons)	W. and McC. (63 persons)
Calories	R	1,994-3,595	1,772-4,955	1,803-3,095	1,453-3,110
	M	2,878 ± 409	3,067 ± 714	2,376 ± 378	2,187 ± 388
Total protein (g.)	R	62-129	53-167	58-107	28-90
	M	92.5 ± 12.8	97.6 ± 23.8	78.8 ± 4.0	67.3 ± 12.4
Animal protein (g.)	R	29-79	30-121	26-79	9-64
	M	46.6 ± 12.7	66.6 ± 19.2	38.9 ± 14.2	46.0 ± 11.3
Per cent of calories from	Carbo-hydrate	R	40-68	33.5-59.8	41-67
		M	51.5 ± 6.0	46.7 ± 5.4	49.6 ± 6.2
	Fat	R	21-48	29.0-50.8	23-47
		M	35.3 ± 5.7	39.1 ± 4.9	37.5 ± 6.4
	Protein	R	10-17	8.3-19.3	10-16
		M	13.2 ± 1.6	13.1 ± 1.9	12.8 ± 2.1
Iron (mg.)	R	11.5-27.0	7.8-28.5	10.0-26.3	5.5-17.3
	M	18.4	16.8 ± 4.64	15.8	11.4 ± 2.50
Calcium (g.)	R	0.6-1.40	0.36-1.96	0.58-1.55	0.23-1.16
	M	0.91	0.87 ± 0.36	0.83	0.63 ± 0.16
Vitamin B ₁ (mg.)	R	0.8-2.18	—	0.71-1.49	—
	M	1.47	—	1.11	—
Ascorbic acid (mg.)	R	36-233	—	57-234	—
	M	119	—	125	—

R = Range. M = Mean. ± = Standard deviation.

usual to determine the concentration of urea in the same specimen. Typical results obtained are shown in Table II. It should be stressed that these determinations were carried

TABLE II.—Excretion of Nitrogen (as g.) in 24-hour Sample of Urine (Men and Women Students)

N by Kjeldahl Method	Urea N	N by Kjeldahl Method	Urea N
14.1	11.2	15.2	10.6
14.1	17.4	14.1	11.3
14.5	11.0	10.4	7.5
13.3	9.4	18.2	—
—	9.9	8.8	—
8.3	10.7	7.2	—
16.2	11.2	7.2	—
18.2	14.5	8.8	—
10.4	7.7	13.0	8.8
18.0	10.1	15.2	14.7
11.9	—	Mean, 13.3	10.9
12.2	—	N × 6.25, 83.1	68.1
18.4	8.3		

out by the students themselves, and the results, owing to inexperience with technical methods, are not of a high degree of accuracy. It will be seen that the average values obtained by multiplying either total urinary nitrogen or urea nitrogen by 6.25 are of the same order as the values for total dietary protein. It should be noted, however, that the collection of the urine samples did not necessarily coincide with the period at which the dietary was taken.

Summary

The dietary intake of a class of university students has been determined by the logbook method. The results are summarized in Table I, which reveals considerable variation in individual intakes. Determination of nitrogen in a 24-hour sample of urine gives a value which when multiplied by 6.25 corresponds to the calculated dietary intake of protein.

REFERENCES

- Hill, A. Bradford (1942). *Principles of Medical Statistics*, Lancet, Ltd., London.
Widdowson, E. M. (1936). *J. Hyg., Camb.*, **36**, 269.
— and McCance, R. A. (1936). *Ibid.*, **36**, 293.