more showing that most of the worms were expelled. The cases were, therefore, almost cured. Some of the cases not cured by the first treatment were given a second treatment. In all 32 out of 47 were cured and 7 more almost cured.

With a dose of 5 to 6 Gm of the oil used on hookworm cases, 28 out of 78 were cured and 6 more almost cured by a single treatment. Some were treated a second time, and after two treatments, out of a total of 78 cases 33 were cured and 11 almost cured.

Out of 13 cases of *Hymenolepis nana* infection treated with 4 to 6 Gm of the oil, 7 were cured by the first treatment and after two treatments 11 were found to be cured. This result deserves particular attention as very few drugs are known to be effective against this infection.

The anthelmintic action is also apparent against *Hymenolepis diminuta, Strongyloides stercoralis* and *Fasciolopsis buski.*

Thus the prepared oil compares very well with the reputed anthelmintics like santonin, oil of chenopodium, hexylresorcinol, tetrachlorethylene and carbon tetrachloride. But each of them has its action against one or only a few more species of parasites. Besides, their toxicity, contraindications or idiosyncracies often tend to limit their use. For example tetrachlorethylene, is used on a large scale but is active best against hookworms only; and its use is contra-indicated where heavy *Ascaris* infection is co-existant. This oil of cashew-nut-shell however, has a wide range of action, is nontoxic, safe and well-tolerated, and has practically no contra-indications. With improvement, this oil, therefore, is expected to be a valuable, cheap and effective indigenous anthelmintic.

Summary

The oil prepared from the shell of cashew nut has been found to be effective in the treatment of various helminthic infections of man. It is, well-tolerated, non-toxic and has only a mild laxative action. No significant lowering effect on blood pressure was observed.

The dose was 5 to 6 Gm for adults. Out of 47 cases of infection by *Ascaris lumbricoides* 30 were cured with a single treatment and in 5 more the egg reduction was from 70 to 80 per cent. Out of 78 cases of hookworm infection 28 were cured and 6 more almost cured by one treatment. One case of *Hymenolepis diminuta* infection, and 1 out of two cases of *Strongyloides stercoralis* infection were cured by one treatment. With two treatments 11 out of 13 cases of *Hymenolepis nana* infection, and 1 case of *Fasciolopsis buski* infection were cured. All the 10 cases of *Enterobius vermicularis* infection passed a large number of worms but none was cured. The drug was not very effective against *Trichuris trichiura* or *Taenia saginata* infections

REFERENCES

Bhaduri, N. V., and Sanyal, P. K. (1952). *Indian Med. Gaz.*, **87**, 573.

Idem (1953). *Bull. Calcutta School Trop. Med.*, **1**, No. 1, p. 16.

Eichbaum, F. W., Koch-Weser, .D,, and Leao, A. T. (1950). *Amer. J. Digest. Dis.*, **17**, 370.

Lane, C. (1922) .. *Trans. Roy. Soc. Trop. Med. and Hyg.*, **16**, 21.

Leao, A. T., and Eichbaum, F. W. (1947). *Mem. Inst. Butantan*, **20**, 13.

Stoll, N. R. (1923) .. *Amer. J. Hyg.*, **3**, 59.

COMPARISON OF NUTRIENT VALUES OF INDIVIDUAL DIETS FOUND BY CALCULATION FROM FOOD TABLES AND BY CHEMICAL ANALYSIS

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A previous communication (Govil *et al*)— reported dietary habits of school boys in Uttar Pradesh, in which nutrient values of the diets were calculated from food tables. All the ingredients of food to be taken were weighed in their raw state and the amount consumed per capita was calculated by dividing the total quantity eaten, by the number of consumers. It gives average values in a group of people. This paper compares the nutrient values of a number of individual diets in respect of certain nutrients, consumed by senior male students of the local Medical College Hostel, found by calculation from Food Tables and by Chemical analysis. One of us (Mitra) did the chemical analysis of

the diets while the inquiry was planned and executed by the other, during the period August 1952 to December 1952, on the basis of the paper by Bransby, Daubney, and King mentioned under references.

Method

Before the start of the investigation, the method of survey was verbally explained and only those who were willing to co-operate were enlisted. The scientific training of the students helped us considerably in the organisation of the enquiry. Records of weight of food eaten in three days were taken for 28 adult students. Duplicates of the same diets were collected by the chemist for analysis and the cost of the food was paid. The estimation of the raw food actually consumed by the students was made on the proportionate quantity of prepared articles of food eaten. This entailed regular daily visit to the kitchen.

The duplicates to all the 3 daily diets were analysed separately and average worked out for Nitrogen (Protein), fat, calcium, phosphorus and iron.

Chemical Analysis.— The diets of each person were analysed by the methods described by Ranganathan, Sundararajan and Swaminathan in the Indian Journal of Medical Research Volume 24, January 3, 1937 page 689.

Food Tables.— The nutrients in the diet were calculated from Health Bulletin No. 23 (1951), (The nuritive values of Indian Foods and the planning of satisfactory diets — Government of India Press, New Delhi).

Results.

The average daily nutrient values for each of the twenty eight diets by calculation from tables and by Chemical analysis are given in Table I. Table II gives the average values for the twenty eight diets taken together and the average per-centage differences between the results obtained by the two methods. The frequency distribution of the percentage differences for the twenty eight diets are shown in Table III.

TABLE I

Daily nutrient values of diets eaten by 28 male adults, obtained by calculation from food tables and by chemical analysis.

Subject No.	Method of Survey	Protein gm.	Fat Gm.	Calcium Mg.	Phosphorus. Mg.	Iron Mg.
1	C	118.8	149.5	1195	2124	31.7
	A	123.6	150.4	500	1920	29.1
2	C	68.1	60 8	793	1640	26.8
	A	65.9	60.5	430	969	29.7
3	C	76.4	106.7	1024	2050	27.9
	A	79.4	106.0	630	1300	31.8
4	C	74.7	76.7	735	1783	25.8
	A	67.0	77.1	410	995	29.9
5	C	85.7	126.9	1310	2274	29.0
	A	87.9	126.4	868	1752	30.7
6	C	132.3	216.6	2750	2979	33.6
	A	132.9	214.8	2391	3957	33.9
7	C	83.6	136.1	1168	2194	22.9
	A	88.8	153.2	709	1386	33.2
8	C	100.5	142.3	1620	3216	27.9
	A	102.6	161.6	587	4910	20.6
9	C	117.8	138.9	2322	2401	30.7
	A	118.8	138.9	1024	3670	28.8
10	C	80.4	157.9	1011	2247	23.4
	A	85.7	156.4	634	1250	35.5

TABLE I (continued)

Subject No.	Method of Survey	Protein gm.	Fat Gm.	Calcium Mg.	Phosphorus. Mg.	Iron Mg.
11	C	108.2	229.9	3810	3299	30.9
	A	112.6	230.2	3460	3068	34.8
12	C	78.4	91.3	650	2495	31.8
	A	75.2	98.5	640	940	39.1
13	C	65.5	104.9	4725	2191	26.2
	A	66.2	105.7	4520	1327	30.6
14	C	73.6	124.9	806	1874	25.8
	A	73.7	123.9	407	1038	27.0
15	C	87.6	121.5	1910	2440	26.0
	A	86.1	120.5	1595	1550	30.6
16	C	96.8	134.6	2034	2719	22.3
	A	93.9	132.9	2490	1780	29.1
17	C	84.6	86.1	1140	2510	22.2
	A	82.6	84.7	580	1620	35.7
18	C	116.0	208.0	3134	3640	29.8
	A	116.9	206.9	8810	2630	34.6
19	C	81.9	136.4	3340	2160	25.2
	A	81.6	134.0	2990	1630	27.6
20	C	141.9	211.1	4806	3560	29.4
	A	146.6	212.7	5240	2930	24.1
21	C	106.5	144.2	2080	2290	31.7
	A	111.5	144.9	990	1608	32.4
22	C	128.6	193.6	3940	3440	26.0
	A	127.2	193.4	3490	2620	28.9
23	C	66.9	73.28	2690	2024	19.6
	A	67.3	72.89	2430	798	30.4
24	C	87.6	130.7	3490	2440	27.0
	A	88.1	126.2	3781	1690	27.9
25	C	89.9	173.0	1655	2576	23.3
	A	95.6	173.3	1234	1850	33.0
26	C	94.3	158.5	1850	2690	29.6
	A	95.7	157.8	1440	1670	33.4
27	C	164.3	136.5	2280	2570	31.1
	A	146.4	142.8	1330	2264	22.3
28	C	132.1	123.0	2160	2670	26.2
	A	128.8	123.9	1430	2120	30.4

C—Calculated from food values given in Health Bulletin No. 23

A—Chemical analysis.

TABLE II

Average daily nutrient values of diets eaten by 28 male adults found by calculation from food tables and by chemical analysis.

	Value by calculation.	Value by analysis.	Absolute difference		Percentage difference	
			Value	Standard Deviation	Value*	Standard Devation.
Protein (g)	97.6	98.1	—0.5	4.06	—0.71	3.7
Fat (G)	139.0	140.1	—1.1	5.17	—0.54	3.4
Calcium (G)	2.1	1.7	+0.4	0.4	+36.4 S	0.06
Phosphorus (G)—	2.4	1.9	+0.5 S	0.85	+38.9 S	0.05
Iron (Mg)	27.2	30.5	—3.3 S	6.08	—8.45	18.8

S—Signifies that the difference is statistically significant.

*For each of the 28 diets, the values calculated—analysis x 100 were found for each nutrient. The figures in this column are the averages of the figures thus found.

TABLE III

*Distribution of percentage differences between values found by calculation from food tables and by chemical analysis.**

Percentage differences	Protein		Fat		Calcium		Phosphorus		Iron.	
0— 9	+8	—19	+17	—9	+3	—1	+1	—	+2	—7
10—19	+1	.	—	—2	+6	.	+2	.	—	—10
20—29	.	.	.	.	+1	—1	+2	—1	+1	—1
30—39	.	.	.	.	+3	.	+4	—1	+2	—5
40 or above.	.	.	.	.	+12	—1	+16	—1	.	.

*This table is based on the values obtained by the formula

Calculated—analysis x 100 for each nutrient of each of the twenty eight diets.

Discussion.

Table II shows that the absolute differences between the average nutrient values found by the two methods of survey are statistically significant for phosphorus and iron but not for protein, fat and calcium. The percentage differences are significant for calcium and phosphorus only. Table III shows that, there are considerable differences between the values found by calculation and those found by analysis for many of the diets. Thus the difference is 10 per cent or more for twenty four, twenty seven, and nineteen of the twenty eight diets for, calcium, phosphorus and iron, respectively; for eighteen, twentyfive and nine diets the difference is 20 per cent or more. There is better agreement for protein and fat where the difference is less than 10 per cent for 27

and twenty six of the twenty eight diets respectively.

There is a closer agreement between the average nutrient values found by calculation from food tables and by chemical analysis for protein and fat, but less for calcium, phosphorus and iron. For iron, the values of absolute difference and percentage difference are so small as to make them unimportant for most practical purposes. The results of the present inquiry therefore indicate that the average values obtained for a group of people by calculation from food tables for protein, fat and iron, are sufficiently accurate for practical purposes. Values for calcium and phosphorus show that calculation from food tables may give very wrong information. The differences in the values found for individual diets may be large enough to make the data found by calculation doubtful.

Summary

1. Weights of the foods eaten in three days were taken for twenty eight male adult students living in the local Medical College Hostel. The nutrient values of these diets were calculated from tables of food composition. Duplicates of the diets were collected and analysed for protein, fat, calcium, phosphorus and iron.

2. The average values ob ained for protein, fat and iron by calculation were in sufficient agreement with those obtained by chemical analysis. The values found for calcium and phosphorus by calculation were much greater than found by chemical analysis.

3. The differences between the values found by calculation and by chemical analysis for individual diets were in many cases so large as to throw doubt on the utility of the individual results obtained by calculation.

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REFERENCES

Bransby, E. R., Daubney, C. G., and King, J. *Brit. J. Nutrit.*, **2**, No. 3. (1948).

Ranganathan, S., Sundararajan, A. R., and and Swaminathan, N. *Ind. Jour. Med. Res.*, 24. (1937).

Health Bulletin No. 23 (1951). The Nutritive value of Indian Foods and the planning of satisfactory diets. Govt. of India Press, New Delhi.

MERCURIAL DIURETIC IN THERAPY WITH SPECIAL REFERENCE TO CONTROL OF ASCITES IN HEPATIC CIRRHOSIS AND ITS TOXIC MANIFESTATION WITH CASE REPORTS

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Cirrhosis of liver, when fully established, precludes any chance of cure, and therapeutic measures are directed towards amelioration of the distressing symptoms. Of the three groups of symptomatology due to parenchymal failure, excretory failure and portal obstruction (Himsworth 1950), the last group attract the attention of the patients predominantly. The distended abdomen full of fluid with or without generalised swelling of the body demands immediate relief. Portal obstruction due to intrahepatic fibrosis, hypoproteinaemia due to deficient function of the liver, accumulation of antidiuretic hormones in the body due to inadequate disposal by the liver and retention of sodium salt in the body due to not-definitely-known causes, are responsible for ascites and oedema (Himsworth, 1950, Karmachandani, 1951). Portal obstruction cannot be removed by medical means, increased intake of protein cannot keep up the plasma protein as the liver is unable to work, nor can intravenous protein administration can keep up a lasting plasma