

# Dietary Intake of College Students in Bahrain

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## ABSTRACT

To complete the study, sixty-six students were chosen from those in their first year at the College of Health Sciences. All the students involved had completed one Credit Course in nutrition. A quantitative analysis of three consecutive days was carried out.

It was apparent that no study had previously been carried out to evaluate the diet of College students in Bahrain. Students present special problems in regard to nutrition and diet. These problems include, little chance of regular meals, limitation of funds available for food and the desire to retain their national diets and dietary habits. A great deal depends on the variety of the food served in the College canteen. Sometimes it serves the students nutritional needs, often it does not.

Accordingly, there was a need to conduct research in the field of nutrition and dietary requirements of College students<sup>1</sup>.

## METHODS

The sample studied was sixty-six students: thirty-one males and thirty-five females. The sample had been chosen by systematic random sample 1:2 from first year students of the College of Health Sciences, who had completed one Credit Course in nutrition as a course requirement. The study involved a quantitative analysis of the diet of these students for three consecutive days.

For three days subjects recorded amounts of all foods and beverages consumed, either by direct weighing or by standard cups or spoons, on the diary forms provided. Special attention was paid to obtain quantitative information regarding mixed dishes, including fats and oils used in cooking.

The daily intake of calories, protein, fat, carbohydrate, iron, vitamin A, thiamin, niacin, riboflavin and vitamin C was calculated using the Food Composition Tables for use in the Middle East<sup>2</sup>. Also, height and weight were measured for all the students.

## RESULTS AND DISCUSSION

The average age for the sample was  $19.69 \pm 1.85$  years. Regarding the number of meals consumed per day, the majority of the students (65.15%) reported a consumption of three meals, while the remainder (34.85%) consumed two meals per day.

The mean height for the male students was  $168.93 \pm 8.49$  cm and the mean weight was  $59.11 \pm 9.54$  kg. The mean height for the females was  $158.89 \pm 5.59$  cm and the mean weight  $54.97 \pm 12.56$  kg. Relative body weight according to<sup>3</sup> standard was 90.49% and 100% for the males and females respectively.

Table 1 demonstrates the mean daily caloric intake and nutrients of the students in both sexes. It is evident that the male students consumed more calories and nutrients than the corresponding females.

Table 2 shows percentage of calories as compared with caloric recommendation of the National Research Council of the U.S.A.<sup>4</sup>. The results revealed that the students had an adequate intake of most of the nutrients. The nutrients with a higher intake relative to Recommended Daily Allowances (R.D.A's) were vitamin C, protein, niacin and thiamin especially among males. While the intake of vitamin A and of riboflavin was slightly lower than that of the R.D.A's for both sexes. Concerning female students, the consumption of iron intake was somewhat low (73%). These findings of the present work are in agreement with the results of Talebany<sup>5</sup> in Baghdad as shown in Table 2. On the other hand Yu-Feng et al.<sup>6</sup>, in Shanghai in a similar study, reported a higher intake of iron than that of the students involved in the present study and a lower intake of calories and protein in comparison with the present study's results.

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TABLE I

## Nutrients Intake of The Students According to Their Sex

Nutrient		Intake	
		Male (31)	Female (35)
Calories	Mean	2662.63	2135.98
	S.D.	(562.02)	(445.60)
Total protein (gm)	Mean	77.73	60.57
	S.D.	(20.44)	(19.79)
Animal protein (gm)	Mean	44.50	31.77
	S.D.	(19.50)	(10.93)
Vegetable protein (gm)	Mean	33.23	28.80
	S.D.	(7.08)	(7.89)
Total fat (gm)	Mean	95.63	46.46
	S.D.	(20.74)	(14.31)
Carbohydrate (gm)	Mean	372.76	301.39
	S.D.	(84.10)	(115.23)
Iron (mg)	Mean	18.70	13.04
	S.D.	(5.78)	(4.89)
Vit. A (I.U.)	Mean	3588.15	2827.47
	S.D.	(2068.91)	(1833.17)
Thiamin (mg)	Mean	1.71	1.08
	S.D.	(0.52)	(0.59)
Riboflavin (mg)	Mean	1.39	1.03
	S.D.	(0.91)	(0.63)
Niacin (mg)	Mean	19.92	14.70
	S.D.	(6.41)	(5.87)
Vit. C (mg)	Mean	99.02	87.54
	S.D.	(94.67)	(38.47)

Anderson et al. <sup>7</sup> reported that riboflavin deficiency was the most common deficiency demonstrated in the Middle East countries, which are predominantly rice-eating. Also Musaiger <sup>8</sup> illustrated a high incidence of iron deficiency anaemia among Bahraini patients discharged from Salmaniya Medical Centre.

Table 3 shows the percentage of calories from different nutrients. It is clear that it was similar for the two sexes. The percentage of calories from total protein was 11.68% and 11.34% for the males and females respectively. These results are in accordance with Talebany <sup>5</sup> who reported 11.6% for males and 12.73% for the females. While in the Shanghai country study <sup>6</sup>, the protein share from the total calories was only 10.7%. Comparing these findings with the result of those found in Minnesota students <sup>9</sup>, it is evident that the percentage of calories from total protein for students in Minnesota was 16.3% while the share of protein for College of Health Sciences students is 11.34%.

The percentage of calories derived from animal protein was 6.69% and 5.94% for males and females respectively. Comparing them with the results of Baghdad University, 4.4% for the males and 5.23% for the females <sup>5</sup>, indicates a better consumption of protein of animal origin for Bahraini students.

Energy supplied by fat and oils was adequate, representing 32.22% of total calories. The main source of energy was from carbohydrates (56%).

TABLE II

## Percentage of Nutrient As Compared With Recommended Daily Allowances

	COLLEGE STUDENTS		BAGHDAD STUDENTS		QI-BAO STUDENTS
	Males	Females	Males	Females	Both Sexes
Calories	88.75	101.71	98	96	85.7
Total Protein	143.94	131.67	168	139	75.4
Iron	130.4	72.44	147	36	186.0
Vit. A	71.76	70.69	96	94	2.1
Thiamin	114.0	98.18	99	93	62.5
Riboflavin	77.22	73.57	143	113	38.5
Niacin	99.6	105.0	117	104	74.8
Vit. C	220.4	194.53	212	221	122.2

TABLE III

Percentage of Calorie Intake From Different Nutrients

	COLLEGE STUDENTS		BAGHDAD STUDENTS		MINNESOTA STUDENTS	QI-BAO STUDENTS
	Males	Females	Males	Females	Both Sexes	Both Sexes
Total Protein	11.68	11.34	11.6	12.73	16.3	10.7
Animal Protein	6.69	5.94	4.4	5.23	—	—
Fat	32.22	32.22	37.79	36.53	35.6	22.7
Carbohydrate	56.0	56.44	50.62	50.74	48.1	66.6

**CONCLUSION**

The estimated intake of nutrients and food consumption of these students suggest adequate intake for most of the nutrients except riboflavin and vitamin A in both sexes and limited intake of iron in females.

**REFERENCES :**

1. W.H.O. Tech. Rep. Ser. University Health Services, 320: 10. (1966).
2. Pellet P.L. and Shadarevian S. Food Composition Tables for Use in the Middle East. 2nd edition P: 13. (1970).
3. Jelliffe D.B. The Assessment of the Nutritional Status of the Community. WHO Monograph No. 53, GENEVA. (1966).
4. Recommended Daily Dietary Allowances. 9th ed. National Academy of Sciences, Washington, D.C. (1974).
5. Talebany L.J. Dietary Evaluation of College Students J. Fac. Med. Baghdad, 23: 2, P: 2P7. (1981).
6. X-Feng S., Zhi-Gen Y. and Zhi-Zian W.A Dietary Survey of Qi-Bao Middle School Students. A.J.P.H., (Supplement) 72: 43. (1982).
7. Anderson L.D., Dibble. M.V., Turkki P.P., Mitchell H.S. and Rynbergen H.J. Nutrition in Health and Disease. 17th ed., P: 372 U.S.A. (1982).
8. Musaiger A.O. Nutritional Deficiencies of Patients Discharged from Salmaniya Medical Centre, Ministry of Health, Public Health Directorate, Nutrition Unit, (1980).
9. Ostrom S. and Labuza T.P. Analysis of a Seven Day Survey of College Students. Food Technology May (1977).