The Sciences 1 (2): 63-66
March-April 2001

Determination of Protein in Pakistani Meal

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The present study deals with the determination of protein contents in Pakistani meals. The daily meals each including breakfast, lunch and dinner was collected for about a week and subsequently analyzed for proteins by the standard techniques. Summing up the three values and comparing with the recommended daily requirements by the recognized experts in nutrition, calculated the intakes of these nutrients per day. From the daily intakes of the nutrients, the daily caloric requirements were also calculated.

Key words: Protein determination, Pakistani meal, protein contents.

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Introduction

Increasing interest and importance is being attached to food in its relations to health (Sun *et al.*, 1999). The science of foodis concerned with the processing of food ingredients, utilized by living organisms to maintain their life. (Svend, 1993). This includes the building and repairing of body tissues, the liberation of energy required to maintain body temperature and for conversion into useful work, to sustain respiration, heart beat and other functions essential for life (Bittenbender, 1970; Dudev and Lim, 2000).

In order to survive, the animals must not only eat but must eat a diet which contains all the six Proximal Principles; Proteins, Carbohydrates, Fats or Lipids, Vitamins, Minerals and Water. Proteins are principally nitrogen suppliers but occasionally they compensate the loss of phosphorus, iodine, iron, copper and zinc (Zoha, 1986). They are highly complex substances consisting of amino acids linked together through peptide bonds. Out of the 20-25 known amino acids, 8 are indispensable for man. The body cannot synthesize them, so they must be provided by the diet (Bodwell *et al.*, 1978). Proteins are the basis of protoplasm of the living tissues. No living tissue is known which does not contain some protein. The amino acids are the units from which the complex protein structure is built. The proteins constitute three fourth of the dry substance of human body. In case of protein deficiency, wounds heal with difficulty and are subjected to various types of infections. The activity of hormones, antibodies and enzymes depends upon the presence of proteins (Bodwell *et al.*, 1978; Beck *et al.*, 1999).

The main objective of the present work is to compute the data that could be read to know the quantities of protein taken per day by the members of lower, middle and upper class families of Pakistan. This data will also include the analysis of different food combinations and thus will tell which combination will be more appropriate choice to keep the nutritional balance for the maintenance of general health and control of diseases.

Materials and Methods

Collection of samples: The food samples for analysis were collected from rich, middle and poor classes of Pakistan. It was planned to collect the full meals daily, taken by above mentioned classes as breakfast, lunch and dinner for one week. The samples were collected, homogenized, weighed and transferred to aluminium trays and preserved in a deep freezer at −16°C.

Analysis: Protein and the Caloric values were computed according to the formula of Gillis (1998).

Results and Discussion

The nutrients under investigation were determined in full meal and their daily intakes were calculated (Tables 1-5). In order to assess the nutritional status of meals the daily intake may be compared with the daily requirements.

Protein: According to the recommendations of different agencies the average daily protein intake for a normal human individual should be 56-80 g/day (Victor *et al.*, 1981, Sun *et al.*, 1999). A comparison of daily intake of protein with the daily requirement indicated that about 85% of meals qualifiified as adequate food in nutritional context. A few combinations such as 4 and 14 supplied protein above average. These combinations contained two meals, which were rich in meat such as fish, mutton, chicken and excess protein intake might lead to accumulation of injurious protein products such as urea, uric acid in blood. It was suggested (Sumner *et al.*, 1981) that the day, which is very rich in meaty ingredients supply excess protein. If at all the meat is to be taken twice a day it should be in small quantities as one or two average sized pieces of mutton, lamb beefs, chicken, fish

Table 1: Composition of Homogenized Meals (Rich Family)

Meal No.	Day	Meal Composition
Breakfast	Sat.	Paratha + sweet curd + tea
	Sun.	Half fried egg + 2 slices + tea
	Mon.	Same as Sund
	Tue.	Slices + Jam + Milk
	Wed.	Same as Mon
	Thr.	Kulcha + Chekarcholey + Milk
	Fri.	Poorian + Choley + tea
Lunch	Sat.	Beans gosht + Boiled rice + 2 oranges
	Sun.	2 Chapaties + Fish curry
	Mon.	2 Chapaties + Matar gosht + Rita + salad + 2 oranges
	Tue.	2 Chapaties + Chicken + Salad + 2 oranges
	Wed.	2 Chapaties + Alu gobhi + 2 oranges
	Thr.	2 Chapaties + Kachnar gosht
	Fri.	2 Chapaties + Alu Keema + 2 oranges
Dinner	Sat.	Boiled rice + Kadu gosht
	Sun.	Gajar alu + Boiled rice
	Mon.	Palik gosht + Boiled rice
	Tue.	Fried fish + 1 Chapaty + Custard
	Wed.	Sample unavailable
	Thr.	Alu matar cholia + 1 Chapaty + 2 oranges
	Fri.	Dalmash gosht + Boiled rice

Table 2: Composition of Homogenized Meals (Middle Class Family)

Meals No.	Day	Meal Composition
Breakfast	Sat.	Repeated No. 2
	Sun.	Butter + Bun + Tea
	Mon.	French toast + Tea
	Tue.	Same as No. 1
	Wed.	Same as No. 22
	Thr.	Same as No. 23
	Fri.	Same as No. 7
Lunch	Sat.	Kofte + Boiled rice
	Sun.	Palao + Shami kabab + Curd
	Mon.	Same as No. 8
	Tue.	Moongre alu + 2 Chapaties
	Wed.	Same as No. 11
	Thr.	Tinda gosht + 2 Chapaties
	Fri.	Liver + 2 Chapaties + Zarda
Dinner	Sat.	Bhindi gosht + 2 Chapaties
	Sun.	Gobhi gosht + 2 Chapaties
	Mon.	Dal chana gosht + 2 Chapaties
	Tue.	Dal moong + 2 Chapaties
	Wed.	Dal chana + Boiled rice
	Thr.	Kofte eggs + 2 Chapaties
	Fri.	Qorma + Palao

Table 3: Composition of Homogenized Meals (Poor Family)

Meals No.	Day	Meal Composition
Breakfast	Sat.	Bhindi Tori + 2 Chapaties
	Sun.	Paratha + Tea
	Mon.	Kulcha + Alu + Lasi
	Tue.	Fried egg + Paratha
	Wed.	Sample unavailable
	Thr.	Mulee Palik + 2 Chapaties
	Fri.	Same as No. 44
Lunch	Sat.	Not available
	Sun.	Began arvi + 2 Chapaties
	Mon.	Same as No. 44
	Tue.	Khichry Dal chana + curd
	Wed.	Began Alu + 2 Chapaties
	Thr.	Phaliyan gosht + 2 Chapaties
	Fri.	Karele keema + 2 Chapaties
Dinner	Sat.	Unavailable
	Sun.	Same as No. 51
	Mon.	Same as No. 48
	Tue.	Dal masoor + 2 Chapaties
	Wed.	Same as No. 54
	Thr.	Same as No. 55
	Fri.	Same as No. 56

Table 4: Protein Contents (%age) of Full Meals

Sample No.	Days	Breakfast	Lunch	Dinner	Total
Rich family					
1.	Sat	4.7	7.05	2.8	14.55
2.	Mon	4.7	4.3	4.1	13.10
3.	Tue	2.6	6.8	9.05	18.45
4.	Wed	4.7	3.84	Not available	
5.	Thr	2.8	6.5	3.28	12.58
6.	Fri	2.42	7.05	4.67	14.14
Middle class family					
7.	Sat	4.7	4.2	3.8	12.7
8.	Sun	2.8	4.2	3.8	10.8
9.	Mon	2.5	4.2	5.2	12.2
10.	Tue	3.5	4.5	4.2	12.2
11.	Wed	4.7	6.8	2.1	13.6
12.	Thr	4.7	3.8	8.2	16.7
13.	Fri	2.42	5.8	6.5	14.72
Poor family					
14.	Sat	3.6	Not available		
15.	Sun	2.8	3.4	3.4	9.6
16.	Mon	5.3	1.8	1.8	8.9
17.	Tue	2.7	1.9	4.0	8.6
18.	Wed	Not available	3.1	3.1	
19.	Thr	1.8	3.8	3.8	9.4
20.	Fri	2.8	3.7	3.7	9.2

Table 5: Total Protein in Full Meal and Their Total Daily Intake (% age.)

Meals	Days	Breakfast	Lunch	Dinner	Total Daily Intake
Rich family					
1.	Sat	15.75	22.05	20.05	58.75
2.	Sun	13.25	35.25	11.03	59.80
3.	Mon	13.25	32.46	16.60	62.31
4.	Tue	9.88	41.02	36.20	87.28
5.	Wed	13.25	17.28	Not available	Not available
6.	Thr.	15.04	22.75	19.68	57.83
7.	Fri	12.01	28.20	21.00	61.32
Middle class family					
8.	Sat	13.25	18.09	20.14	52.29
9.	Sun	8.68	27.03	19.30	55.28
10.	Mon	7.05	22.05	24.96	54.96
11.	Tue	15.75	25.02	16.08	47.75
12.	Wed	13.25	41.02	8.61	63.06
13.	Thr	8.68	23.18	41.82	73.68
14.	Fri	12.01	34.08	42.25	89.15
Poor family					
15.	Sat	14.08	Not available		
16.	Sun	8.04	20.74	20.74	49.88
17.	Mon	26.05	9.00	9.00	44.05
18.	Tue	8.37	5.72	24.00	42.82
19.	Wed	Not available	18.60	18.60	Not available
20.	Thr	9.00	22.99	22.99	54.98
21.	Fri	8.04	24.05	24.05	56.50

etc. Bodwell *et al.*, 1978 and Dudev & Lim, 2000, have also reported similar kind of findings. The combinations, below average, were No.11, 17 and 18. All these combinations did not contain meat and thus were below average in protein contents. The values were not abnormally below average. The reason being the protein in the breakfast contained a protein source such as eggs etc.

Caloric Requirments: The caloric requirements depend upon the individual's activity (Bittenbender, 1970). For example a labourer or an athlete has a caloric requirement much higher than an officer sitting in the office. An average of the recommendation ranged from 1700 to 3000 calories. In Pakistan those who are poor have to do more active work, thus the caloric requirements of the poor families usually greater than the rich family. A general view of the Tables 6 indicates that the caloric intake of rich and middle families is quite adequate. Most of the combinations for poor families seemed to be quite adequate from the view point of their caloric requirements (Gillis, 1998). Some of the combinations

Table 6: Caloric Intake of Proteins (% age)

Meals No	Days	Breakfast	Lunch	Dinner	Total
Rich family					
1.	Sat	63.00	90.00	82.00	235.00
2.	Sun.	53.00	141.00	45.00	239.20
3.	Mon.	53.00	129.84	66.04	249.24
4.	Tue.	39.52	164.08	36.20	349.12
5.	Wed.	53.00	69.12	Not available	Not available
6.	Thr.	61.06	91.00	78.72	231.32
7.	Fri	48.40	112.80	84.00	245.28
Middle class family					
8.	Sat.	53.00	75.00	80.56	209.16
9.	Sun	34.72	109.02	77.20	221.12
10.	Mon.	30.00	90.02	99.84	219.84
11.	Tue.	63.00	100.08	67.20	191.00
12.	Wed.	53.00	164.08	34.44	252.24
13.	Thr.	34.72	92.72	167.28	294.72
14.	Fri.	48.08	139.20	169.00	356.06
Poor family					
15.	Sat.	57.06	Not available	Not available	Not available
16.	Sun.	33.06	82.96	82.96	199.52
17.	Mon.	106.0	36.00	36.00	178.00
18.	Tue.	33.48	22.88	96.00	171.28
19.	Wed.	Not available	74.40	74.40	Not available
20.	Thr.	36.00	91.96	91.96	219.92
21.	Fri.	33.06	96.20	96.02	226.00

i.e., 16 and 18 were not adequate. It is suggested that such combinations should be enriched with the supply of nutrients to pull the caloric intake to about 2500. The study is related with Dudev and Lim (2000). The data revealed that the Pakistani meals with exception of few, to be quite satisfactory and thus it qualified the nutritional standards laid down by national and international agencies.

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