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Nutritional evaluation of mid day meal in selected Govt. School in Ghaziabad District (India)

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ABSTRACT

Assessments of food intake for 150 Government school children 5-13 years of age were performed at a time. Date of birth, sex, weight, height and questionnaire about MDMS programme was taken at the time of field work. Data collection was obtained by using performa having set of questions and interviews. Nutritional value of mid day meal programme at Ghaziabad (U.P.) was analyzed in terms of calories, protein, calcium, Vitamin A, Vitamin-B, Vitamin-C, iron, fat, riboflavin, niacin, carbohydrate, fiber, sodium. The mean values of the above nutrients had been calculated and were found as follows : Calories- 458.12 (S.D.=33.31), protein-10.58 (g) (S.D.= 4.35), calcium-40.18 (S.D.= 22.72), Vitamin A-31.03 (S.D.=28.78), Vitamin B-0.11 (S.D.=0.02), Vitamin-C(mg) 6.57 (S.D.=4.68), iron-2.90(mg) (S.D.=2.18), fat-5.26(g) (S.D.= 2.15), riboflavin-0.05 (S.D.=0.01), niacin-2.00 (S.D.= 0.72), carbohydrate-92.01 (S.D.= 8.89), fiber (g)-0.85 (S.D.= 0.55), sodium-684.78(mg) (S.D.= 298.94).

Key words : School meals, Education attainment, Health, Mid day meal programme, Nutritional evaluation

INTRODUCTION

Food is made up of specific nutrients - proteins, carbohydrates, fats, vitamins, minerals and water - all of which are necessary for life, growth, body function and tissue repair. Nutrition is the most important basic need, being a major determinant of health, labour productivity, and mental development. But in most developing countries of the world, hunger and malnutrition is increasing due to population explosion, shortage of fertile land and high food prices. Protein deficiency is widespread and has been cited as the most common form of malnutrition in developing countries.

Nutritional problems in adolescents starts during childhood and continue, to adult life. Anemia is a key nutritional problem in adolescent girls. Preventing early pregnancies and fortifying the nutritional health of developing girls can reduce maternal and child deaths later, and stop cycles of malnutrition from one generation to the next. For both girls and boys, adolescence is an ideal time to shape good eating and physical activity habits. Nutrition information is required to identify the areas where

nutritional assistance is most needed and monitor the progress of change. In 2006 WHO released international child growth standards that provides benchmarks to compare children's nutritional status within and across countries and regions.

Mid day meal has been introduced in the schools so that Indian system can achieve high literacy rate and a social need to avoid hunger and malnutrition in school children. This programme is an intensive effort to find alternative source of nutrition. As a part of our effort to obtain more information from the various schools, studies were carried out to investigate the nutritional analysis of mid day meals. Analysis can be used as a suggestion/improvement in this programme.

MATERIALS AND METHODS

Research had been conducted to collect data from the Government School from the Ghaziabad District, Uttar Pradesh. Selection of this district is chosen as the research need of rural area's mid day meal. Five schools were chosen under this district. A range of data was collected

Table 1: Frequency of meal according to 7 days among the children of Govt. School

Day	Daliya	Khichiri	Rice Dal	Halwa	Tehri	Kheer	Total(response from the children n=150)
Monday	46	100	0	0	0	4	150
Tuesday	28	30	2	88	0	2	150
Wednesday	37	0	64	29	19	1	150
Thursday	39	46	39	25	0	1	150
Friday	0	2	0	4	27	117	150
Saturday	5	36	18	63	0	28	150

from both female and male heads from each school using female interviewers. All the data had been recorded for all the children from class 1 to 5 as per the performa prepared by the researcher. Studies that had been used to evaluate the nutrient values of student’s intake mid day meal has been cross sectional in nature. Similar analysis had already been done for different geographic locations (2, 3, 4, 5 and 6).

Record of daily food consumed by children of age group among 5-13 years from various classes from 1-5 is presented in Table 1. The recorded food-diary has been developed and used in Mid Day meal food surveys for the age group of 5-13 year-old children in the government schools. Detailed analyses of the results have been presented in Table 2, 3, 4, 5.

RESULTS AND DISCUSSION

Data collection:

Sample size had been chosen n=150. A range of data was collected from NGO employee, female and male students in Table 1. Descriptive statistics with mean intake and standard deviations was used to describe the data. The nutritive values have been calculated from the mid day meals. The means and standard deviations for the basic data and nutritional intakes have been presented in Table 2, 3, 4.

During survey with the NGO employee’s, it was found that an average of 100 g meal was served to each student. Samples have been taken for 150 students, 56 students were female and rest of 94 students were male. It was found that there was difference in intaking food in terms of quantity between opposite sex. Nutritive values have been calculated from the provided meals for all students (also separate calculation is presented for male, and female students).

Table 2 presents the combined nutritive intake of male and female students.

Normalization:

A new table has been derived from the data presented

in above Table 4, 5. In the new table all the values has been normalized *i.e.* mean as well as SD. Reason behind the normalization is, some values of the nutrient are in large values like for Sodium(312.73 mg for female student) and some are very low like for Riboflavin(0.05 for female student). The actual nutrients values are used in the study to see the variation in the data at per unit level. Table is used to compare the standard deviation of male and female student at per unit level. Normalized values have been calculated as :

$$\text{Mean}_{\text{Normalized}} = \text{Mean} / \text{Mean}$$

$$\text{SD}_{\text{Normalized}} = \text{SD} / \text{Mean}$$

For male and female $\text{Mean}_{\text{Normalized}}$ will always equals to 1

Mean values of nutrient and standard deviation have been presented in Table 2 ,3, 4, for simple analysis all the values of mean and standard deviation have been normalized and presented in a separate Table 5. Fig.1 shows the mean values of nutrient. Fig. 2 shows the comparative nutrient study between male and female and

Table 2: Nutrition Intake in Govt. school children

Nutrition in take	Government school student (n=150)	
	Mean	S. D.
Calories (kcal)	458.12	33.31
Protein (g)	10.58	4.35
Calcium(mg)	40.18	22.72
Vitamin-A	31.03	28.78
Vitamin-B	0.11	0.02
Vitamin-C(mg)	6.57	4.68
Iron (mg)	2.9	2.18
Fat(g)	5.26	2.15
Riboflavin	0.05	0.01
Niacin	2	0.72
Carbohydrate	92.01	8.89
Fiber(g)	0.85	0.55
Sodium(mg)	684.78	298.94

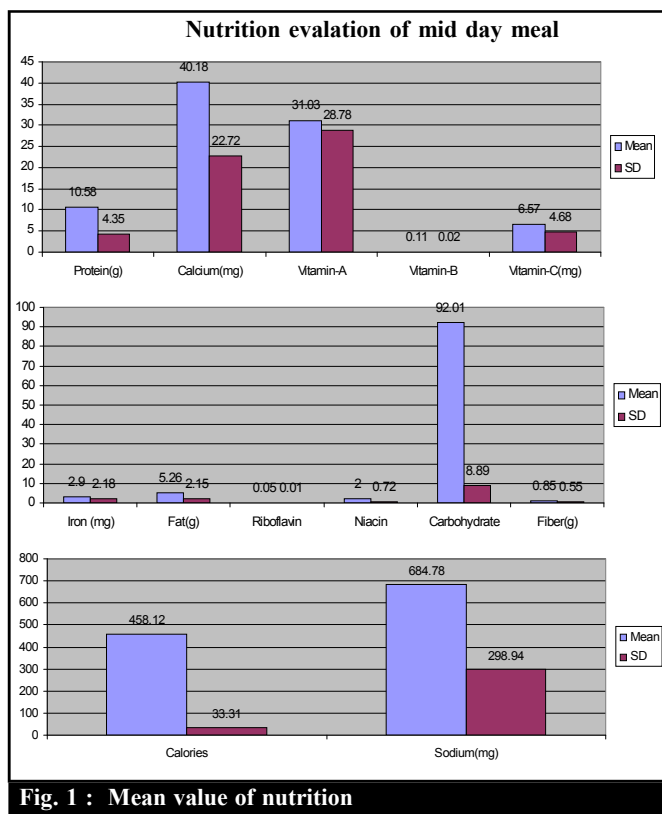


Fig. 1 : Mean value of nutrition

Table 3 : Nutrition in take in Govt. School children (Female)

Nutrition in take	Government school student female (n=56)	
	Mean	S. D.
Protein(grams)	11.06	4.6
Calcium(mg)	42.01	23.73
Vitamin-A	31.04	28
Vitamin-B	0.12	0.01
Vitamin-C(mg)	5.87	4.77
Iron (mg)	3.16	2.36
Fat(g)	5.24	2.28
Riboflavin	0.05	0.01
Niacin	1.89	0.76
Carbohydrate	92.2	9.04
Fiber(g)	0.91	0.59
Calories (Kcal)	460.69	31.98
Sodium(mg)	670.57	312.73

Fig. 3 shows comparative Standard deviation which indicates the data about the mean value. A normalized graph has also been plotted which shows a clear variation of SD between male and female at per unit value for each nutrient. It has been observed that spread of data for vitamin-B and carbohydrates is more in male students in comparison to female students. From Fig. 2 B, all intake nutrients are almost same except carbohydrates which

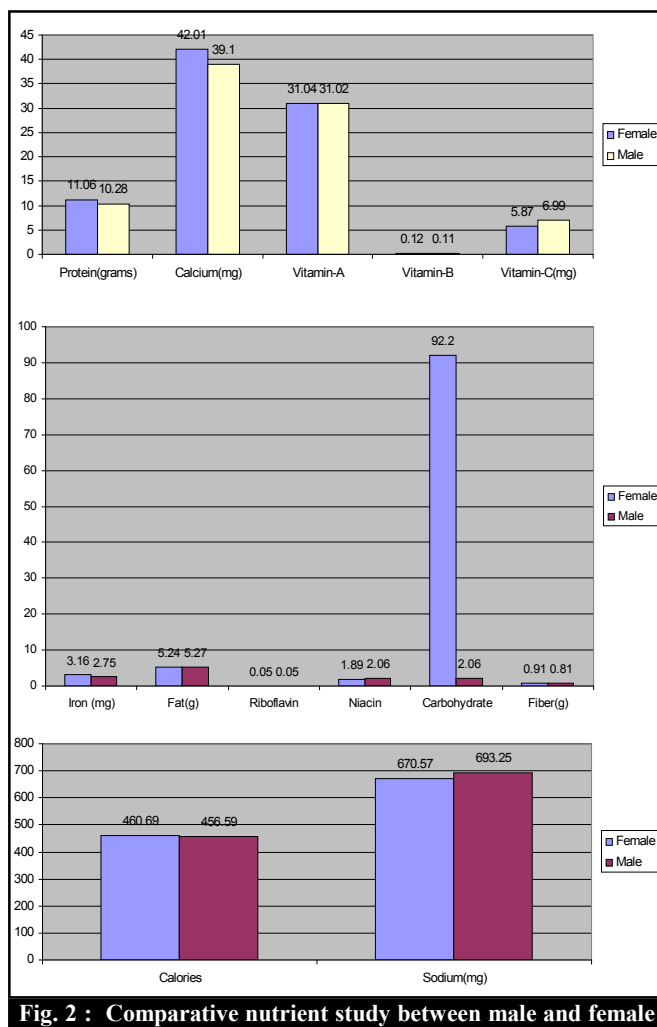


Fig. 2 : Comparative nutrient study between male and female

Table 4: Nutrition Intake in Govt. School children (Male)

Nutrition in take	Government School student male (n=94)	
	Mean	S. D.
Protein (g)	10.28	4.16
Calcium(mg)	39.1	22.02
Vitamin-A	31.02	29.24
Vitamin-B	0.11	0.02
Vitamin-C(mg)	6.99	4.58
Iron (mg)	2.75	2.04
Fat(g)	5.27	2.06
Riboflavin	0.05	0.01
Niacin	2.06	0.69
Carbohydrate	2.06	0.69
Fiber(g)	0.81	0.51
Calories (Kcal)	456.59	33.98
Sodium(mg)	693.25	290.08

have been found more (also very less SD from Fig. 4) for female students.

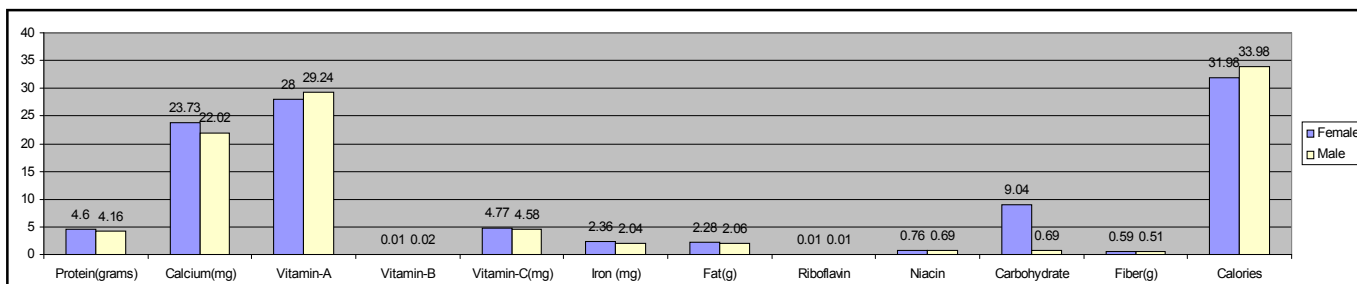


Fig. 3: Comparison of SD between male and female

Table 5: Normalized Table

Nutrition in take	Mean normalized (for female and male)	SD normalized= SD/Mean for female student	SD normalized= SD/Mean for male student
Protein (g)	1	4.6/11.06=0.42	4.16/10.28=0.40
Calcium(mg)	1	23.73/42.01=0.56	22.02/39.1=0.56
Vitamin-A	1	28/31.04=0.90	29.24/31.02=0.94
Vitamin-B	1	0.01/0.12=0.08	0.02/0.11=0.18
Vitamin-C(mg)	1	4.77/5.87=0.81	4.58/6.99=0.66
Iron (mg)	1	2.36/3.16=0.75	2.04/2.75=0.74
Fat(g)	1	2.28/5.24=0.44	2.06/5.27=0.39
Riboflavin	1	0.01/0.05=0.20	0.01/0.05=0.20
Niacin	1	0.76/1.89=0.40	0.69/2.06=0.33
Carbohydrate	1	9.04/92.2=0.10	0.69/2.06=0.33
Fiber(g)	1	0.59/0.91=0.65	0.51/0.81=0.63
Calories	1	31.98/460.69=0.07	33.98/456.59=0.07
Sodium(mg)	1	312.73/670.57=0.47	290.08/693.25=0.42

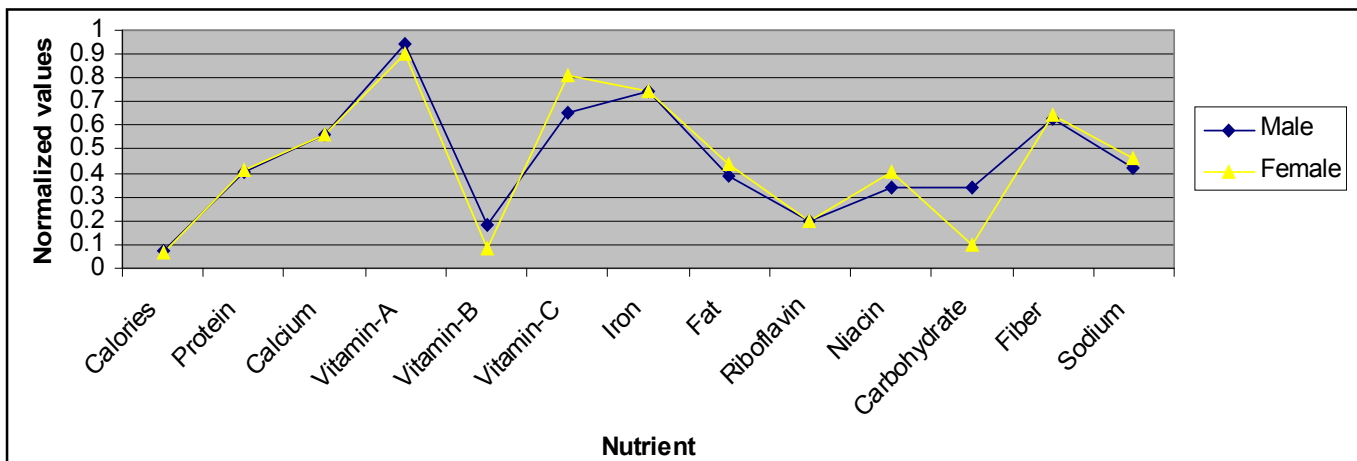


Fig. 4: Comparison of SD between male and female students (S.D. per mean value)

Conclusion:

With regard to the substantive question prepared it was investigated that provided mid day meal and calculated the nutritive values of the mid day meals. A comparative study is also presented about the in take meal between male and female students which shows that all female

students are very consistent in taking food as compare to Male students. From Fig. 6, researcher has also concluded that male students are not well disciplined in taking food as their standard deviation is more for two nutrient. Female students have also shown slightly more variation in S. D. for Niacin and Vitamin C.

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