International Journal of Food Science and Nutrition
www.foodsciencejournal.com
ISSN: 2455-4898
Received: 19-06-2025, Accepted: 20-07-2025, Published: 05-08-2025
Volume 10, Issue 4, 2025, Page No. 35-40

To appraise the breakfast eating habits of school children in rural and urban areas of Varanasi district of U.P.

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Abstract
Breakfast is the most essential meal of the day which provides essential nutrients for optimal health. A nutritious breakfast helps to maintain energy levels and supports overall wellbeing of the children. Eating breakfast regularly facilitates to establish healthy eating habits and assists for physical and mental development of the children. This study was carried out to assess the breakfast eating habits of school going children in rural and urban areas of Varanasi district. Systematic random sampling technique was adopted for the selection of the desirable data of 400 samples. To collect the data regarding breakfast eating habits of school children schedule method was used which consists of set of questions on general profile as well as specific information of breakfast intake of school children. Analysis of the data revealed that school going timing of children did not affect their breakfast consumption pattern. Out of total 400 school going children 95% school children used to have their breakfast whereas only 5% school children were not having their breakfast before leaving for school. Data further revealed that 93% school children of rural areas and 95.9% school children of urban areas are taking significantly ($P<0.001$) less amount of energy as compared to the EAR, whereas 60.9% school children of rural area and 61.7% schools children of urban area are taking significantly ($P<0.01$) less amount of protein as compared to the RDA while 39.1% school children in rural areas and 38.3% school children in urban areas or a total 38.7 % school children of rural and urban areas were consuming more protein than the RDA but it was not significant ($P >0.05$). Hence, it is clear from the findings that the school going children from rural and urban areas were taking significantly less amount of energy and protein in their breakfast on an average as compared to EAR/RDA. Evaluation of the data suggests that there is a need of nutritional education for school children so that nutritional status of school children can be improved.

Keywords: School children, eating habits, breakfast, health, nutrition, EAR, RDA

Introduction

Health is the biggest asset of human life. According to Aristotle, "A healthy mind is formed in a healthy body". Only a physically and mentally sound person can build a healthy society. Habits have a special role in the formation of health, which starts from childhood. Childhood is very crucial period for all type of physical, mental, emotional, and cognitive, language and social development of the children. It is a learning stage and children start learning good habits regarding their health during this period. Nutritious eating habits taught at this stage affect the life of the child for a long time (Ashokan V. *et al*. 2020) [4]. Healthy and nutritious food affects childhood performance but in the present time the food habits of children have changed completely. They love to eat junk food, fast food inspite of nutritious foods which are not good for their health. They don't prefer to eat home cooked nutritious food which is good for their health. Basic behaviors are developed in childhood and if children develop poor and improper eating habits during this age, these habits will become a part of their lives unless appropriate interventions are made (Godwin L. *et al*. 2016) [9].

Nutrient-rich food is a basic human need which is important for appropriate development, and can be adopted in the form of wellness habits to achieve healthy body and healthy future (Agrahari K. *et al*. 2017) [2]. Food we consume has a direct effect on our body and mind. Irritability and sad behavior in nature are displayed in the form of irregular and unhealthy food. Quality and quantity of food affect children's attention, memory and ability to learn (Chauhan V. *et al*. 2018) [6]. Nowadays the eating habits of children have become very strange, the place of balanced and quality diet in their lifestyle has been replaced by snacks and combined food items like pizza, burger etc., which is gradually adding to their habits and making them malnourished (Godwin L. *et al*. 2016) [9].

Breakfast intake is important for the nutritional balance of all population groups. Nutritional intake with breakfast contributes to create a favorable environment for learning processes, concentration, cognitive performance and physical activity (Adolphus K. *et al* 2013) [1]. Inadequate breakfast intake cannot be compensated by other dietary intakes during the day. Skipping breakfast not only affects growth and development but also affect the cognitive performance and emotional engagement. (Moller H. *et al*. 2021) [11].

Breakfast is a very vital morning meal of day, nutritional intake with breakfast imparts good mental health as well as physical well being of the children. At present most of the girl students don't eat their breakfast daily (Sathiya V. *et al*. 2018) [14]. Skipping breakfast and irregular consumption of breakfast are also very common among youth of Sultanpur district (Agrahari K. *et al*. 2017) [2]. One study showed that breakfast eating pattern of Spanish children was not good.

Children were eating poor quality breakfast due to low economic status of the family and it was also found that a large proportion of Spanish school going children were not eating adequate amount of breakfast (Aranceta J. *et al*. 2001) [3].

In India total 2220 kcal energy is recommended for boys (10-12 years) per day while for girls (10-12 years) the total energy requirement is 2060 kcal per day by ICMR-NIN (EAR/RDA-2020). But optimal total energy intake in the breakfast is still not mention clearly anywhere; nevertheless, some researchers suggested that for school-age children, breakfast should provide 20% of total daily energy intake (Monteagudo, C. *et al*. 2013, Faci, M. *et al*. 2001) [7, 12].

This study was planned to evaluate the breakfast eating habits of school going children in rural and urban areas of Varanasi district of Uttar Pradesh. Data obtained from the study are beneficial to correct breakfast eating habits of school children which are very crucial for their good health.

Objective

The objective of this study was:

1. To evaluate the breakfast eating habits of school going children in rural and urban areas of Varanasi district.
2. To examine the energy and protein intake of school going children and compare with the EAR/RDA.

Methods and Material

Study Design: This study was a cross sectional and had a systematic random sample of 400 school going children of 10-12 years of age in primary school. These age group children were selected for the study so that information regarding eating habits has less error. Out of total sample 192 school going children were from rural areas whereas 208 school going children were from urban areas of Varanasi. Boys and girls both were selected for the study, among all school going children 196 were boys and 204 were girls. Selection of subjects on the basis of their gender depends upon the availability of the school children in the particular class of the school. Total 26 schools in rural (13 schools) and urban (13 schools) areas of Varanasi district were selected for the study. Information was collected from schools of all the direction (East, West, North, and South) so that data represent whole population of school going children in Varanasi.

Area of the study: In rural areas Rohania, Hardattpur, Banwaripur, Gosaipur, Shivpur, Chiraigaon, Harahua, Sewapuri, Ashapur, Khochawa, Cholapur were selected to study the food eating habits of breakfast of school going boys and girls. To get the desirable information related to the food eating habits of school going children from urban areas B.L.W, Lohta, Cant, Gaudoliya, Maidagin, Jagatganj, Pandeypur, Lahurabeer, Kachehari, Chitaipur, Gurubaag, Pahadia, Bhojubeer were selected.

Data Collection Tools

Schedule Method: Schedule method was used to collect the information regarding the breakfast eating habits of the school going children. Schedule is a structured set of questions for data collection and in this method, questions were asked from the school children about their breakfast eating habits and response of the children were recorded immediately by the researcher. This method was used for more accuracy and to minimize the error.

Dietary Survey: Daily dietary intake of breakfast of school going children was recorded for five consecutive days. Questions were asked to the school children regarding their diet especially for breakfast and different sizes of cups, bowls and glasses were used to collect the exact information of their breakfast in term of quantity and quality. Information given by school children regarding their diet was recoded immediately in the prepared performa. Dietary survey is useful criteria for knowing food eating habits of children. Energy and Protein were calculated to know the per day intake of calorie and protein (C. Gopalan, 2012) [5] and compared with the ICMR- NIN standards (EAR/RDA 2020).

EAR and RDA: There is no RDA for energy in Nutrients Requirements for Indians given by ICMR- National Institute of Nutrition (NIN), Hyderabad. It is Estimated Average Requirements (EAR) for energy. EAR of energy for 10-12 years old boys and Girls are 2220 kcal and 2060 kcal respectively. Details of EAR for energy and RDA for Protein are given below (EAR/RDA- ICMR-NIN, 2020)

Table 1: Nutrient requirements for Children. Estimated Average Requirements (EAR) and Recommended Dietary Allowances (RDA) - 2020

Sl. No.	Age Group	Category of work/ Age	Body wt. (kg)	EAR for Energy (kcal/day)	RDA for Protein(gm/d)
1.	Boys	10-12 years	34.9	2220	32.0
2.	Girls	10-12 years	36.4	2060	33.0

Results and Discussion

The result of the present study has been described in the form of tables. These tables provide an overview of distribution of school going children according to their age group, gender, tendency to have breakfast in relation to school timing, breakfast eating habits, intake of energy and protein in breakfast, percent intake of energy and protein as compared to EAR/RDA in rural and urban areas of Varanasi district. Results are discussed under the following tables.

Table 2: Classification of school going children based on age and gender

Age group (year)	Number of schools going children	percentage
10.0 - 10.5	100	25.0
10.6 - 11.0	108	27.0
11.1 – 11.5	67	16.7
11.6 – 12.0	125	31.3
Total	400	100.0
Gender		
Boys	204	51.0
Girls	196	49.0

Table 2: This table depicts the total number of schools going children of different age group as well as their gender. Data showed that out of total school going children 25% children were having age of 10.00- 10.5 years, 27% children had age of 10.6-11.0 years, 16.7 % children had age of 11.1 -11.5 years while 31.3 % children had 11.6-12.0 years of age. Maximum numbers of children were of age group 11.6-12.0 years while the age group of 11.10-11.50 years was in minimum numbers in the study.

The percentage of boys and girls among all the selected school going children was 51 and 49 respectively. The little difference in percentage of their gender was depending upon the systematic random sampling and the availability of boys and girls in the school.

Table 3: Classification of school going children based on tendency to have breakfast in relation to school timing

School Going Time	Tendency to have breakfast					
	Yes		No		Total	
	No.	Percent	No.	Percent	No.	Percent
5:30 – 6:30	32	100.0	0	0.0	32	100.0
6:30 – 7:30	64	94.1	4	5.9	68	100.0
7:30 – 8:30	152	90.5	16	9.5	168	100.0
8:30 – 9:30	132	100.0	0	0.0	132	100.0
Total	380	95.0	20	5.0	400	100.0

Test of significance - x^2=15.98, df=3, P<0.01

Table 3: The above table describes the classification of school going children on the basis of their tendency to have breakfast in relation to school timing. All the school children 32 (100%) who were going to school early in the morning between 5:30 to 6:30 A.M. had their breakfast before leaving for school although their consumption of energy and protein in breakfast was less than the requirements. 94.1 % School children who were going to school between 6:30 to 7:30 A.M. had their breakfast while only 5.9% school children were not having their breakfast before going to school. When the school going timing was 7:30 to 8:30 A.M. then 90.5% children were going to school after having their breakfast whereas 9.5 % school children were skipping their breakfast. All the school children (100%) were having their breakfast before going to school when the school timing was 8:30 to 9:30 A.M. School children who did not have breakfast before going to school they said that sometimes they were getting late or they didn't like having breakfast early in the morning. Agrahari K *et al*., 2017 [2] also found that 65% of youth were skipped their breakfast due to lack of time and some they disliked it. One important fact in this table is that all the school children (100%) who were going to school between 5:30 to 6:30 A.M. and 8:30-9:30 A.M. were not skipping their breakfast before going to school. Analysis of the above table shows that school going timing of children did not affect their breakfast consumption pattern. Significant difference (P<0.01) has been found in the given data on the basis of statistical analysis.

Table 4: Classification of boys and girls based on breakfast eating habits in rural and urban areas

Area	Gender	Breakfast eating habit						Test of significance
		Yes		No		Total		
		No.	Percent	No.	Percent	No.	Percent	
Rural	Boys	88	95.7	04	4.3	92	100.0	x^2=0.02
	Girls	96	96.0	04	4.0	100	100.0	df=1
	Total	184	95.8	08	4.2	192	100.0	P>0.05
Urban	Boys	108	96.4	04	3.6	112	100.0	x^2=2.16
	Girls	88	91.7	08	8.3	96	100.0	df=1
	Total	196	94.2	12	5.8	208	100.0	P>0.05
Both	Boys	196	96.1	08	3.9	204	100.0	x^2=1.02
	Girls	184	93.9	12	6.1	196	100.0	df=1
	Total	380	95.0	20	5.0	400	100.0	P>0.05

Table 4: This table represents the breakfast eating habits of boys and girls studying in school of rural and urban areas of Varanasi. Analysis of the above table shows that out of total 192 school children of rural areas 95.8 % children went to school after having breakfast while 4.2% school children skipped their breakfast because they said that breakfast was not ready by the time they left for school. In rural areas 95.7% boys and 96.0% girls had their breakfast while 4.3% boys and 4.0% girls didn't have breakfast before going to school.

In case of urban areas out of total 208 school children 94.2% school children had breakfast and 5.8% didn't have their breakfast before leaving for school. Data further indicates that 96.4% boys and 91.7% girls form urban areas had their breakfast before going to school. Boys and girls from urban areas were skipping their breakfast and said that they didn't feel like having breakfast early in the morning. Out of total 400 school going children 95% school children used to have their breakfast whereas only 5% school children skipped their breakfast before leaving for school. According to statistical analysis, significant similarity (P>0.05) has been found in the breakfast eating habits of boys and girls.

Table 5: Comparison of average energy and protein intake of breakfast by school going children with the EAR*/RDA**.

Energy and Protein of breakfast	Gender	Age	Average	Standard Deviation	EAR/RDA for breakfast	t-test	Df	P value
Energy	Boys	10-12 year	258.84	116.65	444 kcal	22.33	195	<0.001
	Girls		235.47	105.99	412 kcal	22.59	183	<0.001
Protein	Boys	10-12 year	6.85	4.43	6.40 gm	0.94	195	>0.05
	Girls		5.97	2.93	6.60 gm	3.16	185	<0.01

* Estimated Average Requirement

** Recommended Dietary Allowances

Table 5: This table represents the average intake of energy and protein of school going children in breakfast and compared with Estimated Average Requirement of energy and the recommended dietary allowance (RDA) of protein which shows that the average intake of energy and protein (in case of girls) taken by school going children in breakfast was less than the EAR/RDA. 20 % energy/ nutrient intake is recommended in breakfast (Monteagudo, C. *et al*. 2013, Faci, M. *et al*. 2001) [7, 12] and on the basis of this average energy and protein intake was calculated. The statistical t-test makes it clear that the average energy intake by the school going children is significantly less than the EAR. The average protein intake of boys was little more than the RDA but it was not significant whereas the girls were taking significantly less amount of protein on an average as compared to the RDA. Hence, it is clear from the study that the school going children of the selected schools are taking significantly less amount of energy and in case of protein only girls were consuming less protein in their breakfast on an average while boys were taking little more amount of protein as compared to the RDA but it was not significant.

Table 6: Classification of energy and protein content in breakfast of rural and urban school children based on percentage of standards (EAR/RDA).

Energy and Protein of breakfast	% Intake as compared to RDA	Area						Test of significance
		Rural		Urban		Total		
		No.	%	No.	%	No.	%	
Energy	<50	68	37.0	92	46.9	160	42.1	x^2=4.35 df=2 P>0.05
	50-99	103	56.0	96	49.0	199	52.4	
	100 or above	13	7.1	08	4.1	21	5.5	
	Total	184	100.0	196	100.0	380	100.0	
Protein	<50	28	15.2	32	16.3	60	15.8	x^2=0.09 df=2 P>0.05
	50-99	84	45.7	89	45.4	173	45.5	
	100 or above	72	39.1	75	38.3	147	38.7	

Table 6: This table describes the percentage of energy and protein intake of school going children in breakfast as compared to the standard (EAR/RDA) of rural and urban areas. Data clearly represents that 94.5% children are taking significantly less energy than the standard, whereas in terms of protein 61.3% children have been found to have significantly less protein than the standard. A comparative study of children of rural and urban areas shows that 93% children studying in schools of rural areas and 95.9% children studying in schools of urban areas are taking less amount of energy as compared to the EAR, whereas 60.9% children studying in schools of rural area and 61.7% children studying in schools of urban area are taking less amount of protein as compared to the RDA.

The statistical chi-square test makes it clear that there was no significant difference at any level of significance in the intake of energy among children of rural and urban areas. No significant difference was found with respect to protein either, that is, the percentage of energy and protein intake in breakfast as compared to the standard by children studying in rural and urban areas was found to be almost significantly the same. Although the intake of energy and protein was significantly less in breakfast by school going children in both rural and urban areas of Varanasi.

Table 7: Classification based on percentage of energy levels in breakfast as compared to the recommended intake of school going children in rural and urban areas

Area	% Intake of energy as compared to EAR	Gender						Test of significance
		Boy		Girl		Total		
		No.	%	No.	%	No.	%	
Rural	<50	40	45.5	28	29.2	68	37.0	x^2=9.78 df=2 P<0.01
	50-99	39	44.3	64	66.7	103	56.0	
	100 or above	09	10.2	04	4.1	13	7.0	
	Total	88	100.0	96	100.0	184	100.0	
Urban	<50	44	40.7	48	54.5	92	46.9	x^2=8.89 df=2 P<0.05
	50-99	56	51.9	40	45.5	96	49.0	
	100 or above	08	7.4	0	0.0	08	4.1	
	Total	108	100.0	88	100.0	196	100.0	
Both	<50	84	42.8	76	41.3	160	42.1	x^2=87.30 df=3 P<0.05
	50-99	95	48.5	104	56.5	199	52.4	
	100 or above	17	8.7	04	2.2	21	5.5	
	Total	196	100.0	184	100.0	380	100.0	

Table 7: This table indicates the percent intake of energy in breakfast by school going boys and girls as compared to EAR in rural and urban areas. Data revealed that out of total 184 school children from rural area, 88 were boys and 96 were girls. Out of which 93.0% school going boys and girls were consuming less amount of energy than the requirement whereas only 7.0 % school going boys and girls were taking sufficient amount of energy as recommended by ICMR-NIN. Comparative study of boy and girl children shows that 89.8% boys and 95.9% girls' children were consuming insufficient amount of energy than the recommended level whereas 10.2% boys and 4.1% girls, i.e. 7 % of total school children of rural areas were consuming adequate amount of energy as recommended by ICMR-NIN.

Analysis of the table further shows that a total of 196 school children of urban area, including 108 boys and 88 girls were having their breakfast daily but out of which 92.6% boys, 100% girls, total 95.9% school going boys and girls were

consuming low energy as compared to the recommended allowances. Only very few percentages of school going boys (7.4%) and girls (0%) hence a total of 4.1 % school going children were taking adequate amount of energy in breakfast as recommended by ICMR-NIN, Hyderabad**.** Children who were not taking their breakfast (20 school children) were excluded from this category. Therefore, a total of 380 students from both rural and urban areas were having their breakfast daily, out of which 196 were boys and 184 were girls. 91.3% boys, 97.8% girls or a total 94.5% school children were taking less energy than the EAR while 8.7% boys, 2.2% girls or 5.5% school children in total were taking adequate energy as recommended. Significant difference was found in the given data.

Table 8: Classification based on percentage of protein level in breakfast as compared to the standard intake of school going children in rural and urban areas

Area	% Intake of Protein as compared to RDA	Gender						Test of significance
		Boy		Girl		Total		
		No.	%	No.	%	No.	%	
Rural	<50	16	18.2	12	12.5	28	15.2	x^2=5.89 df=2 P>0.05
	50-99	32	36.4	52	54.2	84	45.7	
	100 or above	40	45.4	32	33.3	72	39.1	
	Total	88	100.0	96	100.0	184	100.0	
Urban	<50	16	14.8	16	18.2	32	16.3	x^2=0.59 df=2 P>0.05
	50-99	49	45.4	40	45.5	89	45.4	
	100 or above	43	39.8	32	36.3	75	38.3	
	Total	108	100.0	88	100.0	196	100.0	
Total	<50	32	16.3	28	15.2	60	15.8	x^2=3.43 df=2 P>0.05
	50-99	81	41.3	92	50.0	173	45.5	
	100 or above	83	42.4	64	34.8	147	38.7	
	Total	196	100.0	184	100.0	380	100.0	

Table 8: This table represents the percent intake of protein in breakfast by school going boys and girls as compared to RDA in rural and urban areas. Children who were not having their breakfast were not taken in to the consideration for the above table. So, there were total 380 school children who were having their breakfast. Data showed that a total of 184 children from rural areas were having breakfast out of which 88 were boys and 96 were girls. 60.9% of school children were found to be consuming less protein than the recommended level in rural area. Comparative study of boys and girls school children indicated that 54.6% boys and 66.7% girls' children were consuming less protein than the RDA, while 45.4% boys and 33.3% girls' children, total 39.1% students were consuming more protein than the RDA but it was not significant (P >0.05). A total of 196 school children (108 boys and 88 girls) from urban area were daily having breakfast before leaving for school. Protein intake of 60.2% boys and 63.7% girls or a total 61.7% school children was less than the RDA in urban area, while 39.8% boys, 36.3% girls, hence a total of 38.3% school children were taking more protein (P >0.05) as compared to the RDA.

Total 380 school children (196 boys and 184 girls) from rural and urban areas were having their breakfast daily and out of which 57.6% boys, 65.2% girls, or a total of 61.3% school children were consuming less protein than the RDA, while 42.4% boys, 34.8% girls, or a total of 38.7% school children were consuming more protein than the RDA but it was not significant.

The statistical chi-square test (x^2) shows that there is no significant difference at any level in the tendency of consuming protein in breakfast by the children studying in the school of rural and urban area, that is, the percentage of children consuming protein in breakfast as compared to the standard was found to be almost significantly the same for both rural and urban school children.

Conclusion

This study was conducted to evaluate the breakfast eating habits of school going children in rural and urban areas of Varanasi district. 10-12 years old school boys and girls were selected so that the data regarding eating habit which is obtained from the school children have minimum error. Data revealed that school timing of the children does not affect their breakfast consumption pattern, although the energy and protein intake in breakfast was low in case of both boys and girls as compared to EAR and RDA whereas in case of protein, girls were consuming less protein than the RDA while average protein intake of boys was little more in both rural and urban areas although the difference was not significant. Most of the school children (95%) used to have their breakfast before going to school while very little percentage (5%) of school children were skipping their breakfast. Data further explained that the school going children of the selected schools were taking significantly less amount of energy on an average while in case of protein girls were consuming significantly low amount of protein whereas boys were taking little more amount of protein in their breakfast but it was not significant. Result of the study suggests that there is a need to develop some breakfast eating habit related strategy to improve the health status of school going children and for that nutritional education is required for school children.

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