



# Assessment of Food Consumption Pattern of Rural School Children of Arwal District in Bihar

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## ABSTRACT

**Background:** The dietary and nutrition transition in rural areas, influenced by improved agricultural practices and food processing techniques, has led to imbalanced nutrient intake among children, impacting health profiles. This study explores the changing dietary patterns among rural school children in Arwal district, Bihar. The research aims to observe the consumption of various food items and their timely practices within households.

**Methods:** A cross-sectional study was conducted using a pretested semi-structured questionnaire among 154 rural school children which is randomly selected in Arwal district.

**Result:** Results indicate that the majority of participants (55.19%) belong to the 18-21 age group. Timely consumption of green vegetables, tea and coffee is prevalent among participants. However, variations exist in the consumption of cereals, dal, rice and other food items. The study reveals that dietary diversity among rural school children is generally low, with 48.70% falling within the 4-5 DDS range.

**Key words:** Consumption pattern, Dietary diversity, Rural children.

## INTRODUCTION

The importance of food for human health is known since the Hippocrates's days, when he said "Let food be thy medicine and medicine be thy food" (let food be your medicine and medicine be your food). The consumer's standard of living, work culture, hectic schedule, liberal and global thoughts are changing rapidly. These impact our dietary pattern and routine food consumption. Out of various foods consumed across the world, "fast food" is one that is becoming popular among masses, especially young generations, thereby it is one of the fastest growing industries. Hence, it is pertinent to know about the fast food and its impact on consumers. Eating out in India has evolved from an occasion driven activity to an everyday activity and fast-food has become a significant symbol for the modern culture as it tends to satisfy customers in a relatively short time (Narayan and Prabhu, 2015). India also has long tradition foods with variety of recipes that still prevail in various part of country. Indian foods that includes in fast food lists are alloo-tikki, bhelpuri, panipuri, paav-bhaji, chat, pakora, samosa, Kachaudi, chole-bhature, idali, dosa, uttapam, etc. IFF depends on the cooking method. Indian fast foods (IFFs) are traditionally prepared by deep frying in fat (Keshari and Mishra, 2016). The dietary and nutrition transition has been characterized by the improved agricultural practices, food supplies and advances in food processing techniques, while making more food available to children has resulted in imbalanced nutrient intake resulting in changes the profile for health (Prakruthi *et al.*, 2013). There is a trend of declining cereal intake particularly coarse cereals and really low increase of consumption of

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other food items within the rural diet, which has often been explained as an expected outcome of economic growth. These changes in diet pattern, however, are not uniform rather vary across various socio-economic groups (Gupta *et al.*, 2014). Such differential access to food has resulted in widening inequalities among these groups in terms of nutrition intake, which in turn may lead to inequalities in health outcomes. While with increase in per capita income, decline in cereal consumption is expected to some extent, it is important to note that cereals are considered to be among the best source of energy and they also provide important nutrients to the body but they lack some micronutrients such as vitamins and minerals (Gopalan,

2016). This study was undertaken to observe the dietary pattern of different food items and their timely consumption and practices of daily food items used in kitchen.

## MATERIALS AND METHODS

It was a cross-sectional study done in Arwal district of Bihar with the help of pretested semi structured questionnaire amongst the rural school children. A school-to-school survey was performed in which the selection of participants was done by random sampling method. Dietary diversity of the rural school children was measured by calculating their Dietary Diversity Score (DDS). DDS is the description of different food groups consumed in a reference period. Diversity of food break the monotony of diet and result in augmentation of energy consumption and also the micronutrients intake in the developing nations. Dietary diversity score was computed based on 12 food groups given by Food and Nutrition Technical Assistance (FANTA) Project (Swindale and Bilinsky, 2006). Last 24 hours were taken as reference period to collect information accurately. Food items eaten by respondent at home and outside the home were considered and one point was allocated for each food groups consumed over the last 24 hours while zero score was given if no food group was consumed. Total 154 subjects were interviewed in one month period. Prior verbal consent was taken from each subject in study before giving him or her the pretested semi structured questionnaire. The questionnaire consisted of questions related to their daily household consumption and practices. The collected data was entered in the excel sheet. The data analysis was done with the help of appropriate statistical test at the end of study.

## RESULTS AND DISCUSSION

Table 1 describes age and sex wise distribution of the children, where it was found that the maximum participants 85 (55.19%) belong to 18-21 years of age group.

Table 2 describes the frequency of consumption of different food items. It was found 134 (87.01%) of participants consumed green vegetables daily. Daily consumption of beverages such as tea and coffee were found common to 148 (96.10%) participants. It was also found that 95 (61.68%), 88 (57.14%) and 90 (58.44%) were found to consume dal, pickle and rice on daily basis respectively. Milk was never consumed by 24 (15.5%) participants. Sprouts intake is must but in the study majority 110(71.42%) took it sometimes i.e. occasionally.

A study found that majority of women in India (85%) consumed pulses or beans and green leafy vegetables at least once a week with the exception of Kerala. Padmadas (2003) reported that consumption of egg and meat products was found relatively low in several states, particularly in the North. George *et al.* (2020) study in Kerala and found that penurious diet patterns among females. They found 64.6% were used to skip one meal in a day and 86.7% consumed junk food with decreased consumption of green leafy vegetables and no fruits. Contrary to this, the present study found daily consumption of green vegetables by 87.01% participants. According to the 1998 FAO report, the average Indian dietary intake is mostly deficient in the consumption of green leafy vegetables, milk and milk products and meat.

Table 3, shows different uses of daily food items according to the population. Iodized salt intake consumption was seen in majority 148 (96.10%). Use of mustard oil and flour without choker in the kitchen was found to be 93 (60.38%) and 118 (76.62%) respectively. In a study done by Prakruthi and Prakash in the state of

**Table 1:** Age and gender-wise distribution of participants.

| Age group | Males | Females | Total (%)   |
|-----------|-------|---------|-------------|
| 10-13     | 14    | 12      | 26 (16.8)   |
| 14-17     | 48    | 37      | 85 (55.19%) |
| 18-21     | 20    | 10      | 30 (19.48)  |
| 22-25     | 7     | 6       | 13 (8.54)   |

**Table 2:** Timely consumption of different food items.

| Food items       | Eat daily (%) | 1-2 times a week (%) | 3-4 times a week (%) | 1-2 times a month (%) | Sometimes (%) | Never (%)  |
|------------------|---------------|----------------------|----------------------|-----------------------|---------------|------------|
| Chapattis        | 154 (100)     | 0 (0)                | 0 (0)                | 0 (0)                 | 0 (0)         | 0 (0)      |
| Dal              | 95 (61.68)    | 43 (27.9)            | 13 (8.44)            | 3 (1.94)              | 0 (0)         | 0 (0)      |
| Rice             | 90 (58.44)    | 39 (25.3)            | -                    | 9 (5.84)              | 16 (10.3)     | 0 (0)      |
| Milk             | 83 (53.89)    | 6(3.8)               | 7 (4.54)             | 3 (1.94)              | 31 (20.12)    | 24 (15.5)  |
| Ghee/Dalda       | 30 (19.48)    | 19 (12.3)            | 4 (2.59)             | 61 (39.61)            | 40 (25.9)     | 00         |
| Green vegetables | 134 (87.01)   | 1 (0.64)             | 3 (1.94)             | 4 (2.59)              | 26 (16.88)    | 00         |
| Kand             | 10 (6.4)      | 14 (9.09)            | 14 (9.09)            | 62 (40.25)            | 54 (35.06)    | 00         |
| Sprouts          | 13 (8.4)      | 12 (7.7)             | 0 (0)                | 12 (7.79)             | 110 (71.42)   | 7(4.54)    |
| Tea/coffee       | 148 (96.10)   | 0 (0)                | 0 (0)                | 0 (0)                 | 6 (3.89)      | 0 (0)      |
| Soft drinks      | 34 (22.07)    | 2 (1.29)             | 4 (2.59)             | 18 (11.68)            | 75 (48.70)    | 21 (13.63) |
| Pickle           | 88 (57.14)    | 8 (5.19)             | 5 (3.24)             | 3 (1.94)              | 45 (29.2)     | 5 (3.2)    |
| Salad            | 68 (44.15)    | 10 (6.49)            | 14 (9.09)            | 1 (0.64)              | 55 (35.7)     | 6 (3.89)   |

**Table 3:** Use of daily food items and common practices in kitchen.

| S. no.                                         | Food items       | Total popul. (%) |
|------------------------------------------------|------------------|------------------|
| Use of salts                                   | Iodized salt     | 148 (96.10)      |
|                                                | Non-Iodized salt | 3 (1.94)         |
| Use of oils                                    | Mustard oil      | 93 (60.38)       |
|                                                | Groundnut oil    | 30 (19.48)       |
|                                                | Soya bean oil    | 20 (12.98)       |
|                                                | Mixed oil        | 11 (7.14)        |
|                                                | With choker      | 45 (29.22)       |
| Flour used                                     | Without choker   | 118 (76.62)      |
|                                                | Don't wash       | 0(0)             |
| No. of times washing of cereals (dal and rice) | 1 time           | 50 (32.46)       |
|                                                | 2 times          | 97 (62.98)       |
|                                                | 3 times          | 15 (9.7)         |
|                                                | After cutting    | 35 (22.72)       |
| When do you wash vegetables                    | Before cutting   | 128 (83.11)      |
|                                                | Both             | 2 (1.29)         |

**Table 4:** Describing the types of food consumption.

| Types of food        | Males | Females | Total (%)  |
|----------------------|-------|---------|------------|
| Veg.                 | 40    | 30      | 70 (45.45) |
| Non-Veg.             | 23    | 11      | 34 (22.07) |
| Eggiterian           | 33    | 16      | 45 (29.22) |
| Occasionally non-veg | 0     | 14      | 5 (3.24)   |

**Table 5:** Distribution of rural school children on the basis of their dietary diversity score.

| DDS | Children |       |
|-----|----------|-------|
|     | f        | %     |
| ≤3  | 45       | 29.22 |
| 4-5 | 75       | 48.70 |
| ≥6  | 34       | 20.07 |

Note: \*≤5= Low dietary diversity score.

\*≥6= High dietary diversity score.

Karnataka, it was found that a high consumption of fats from 146.5% to 212% of the recommended intake. The present study shows that 60% of the school children used oils daily in food. The fat consumption was much higher than recommendation in all the age groups ranging from 146.5 to 212% of the desired intake with marginally significant difference between groups. Washing practices of cereals, at least two times a day was seen in 97 (62.98%) participants and it was also observed that 128 (83.11%) participants practiced washing of vegetables before cutting.

Table 4, shows the moderate pattern of consumption of vegetarian foods by 70 (45.45%) participants while 45 (29.22%) were eggiterian. A study found, among girls within the low mixed diet cluster, quite three-fifth consume milk/curd, pulses/beans and other vegetables on a day to day whereas only negligible proportions seem to possess consumed eggs, meat/chicken/fish. This clearly points

precisely to the distinctiveness of the low mixed diet cluster. About 99% of girls during this cluster consume important vegetarian foods; quite 60% of them tend to consume vegetarian foods on a day to day. Similarly, the present study found 45% of participants consumed vegetarian food items daily.

It is apparent from Table 5 that a maximum percentage (48.70%) of children follow the range 4-5 DDS, followed by 20.07 per cent children with DDS 6 or more than 6 and remaining 29.22 per cent respondents' score was 3 or less than 3. Majority of the rural school children fall under low DDS category. Maximum percentage (48.70%) of children follow the range 4-5 DDS (Low dietary diversity score). Similar findings reported by Mirmiran (2004) stated that 50 per cent of the respondents had 5 DDS which show the low dietary diversity score.

## CONCLUSION

Out of total population majority of the respondents belonged to the age group of 14-17 yrs. of age thereby the response what we got in the study showed a peak view of young age choices. While most of them were vegetarian by diet. Many of them were aware of their consumption of food and its pattern, still few were lagging. Chapatti was the most common food item which was included at least once in a day. Next in the row comes rice, dal and milk which were consumed daily by the respondents. Consumption of green vegetables was seen daily in their diets on majority basis, but on the personal contrary the amount consumed was not as per RDA. Pickles and salad were common and consumed daily. Use of iodized salt was seen to be practiced by majority of them. More than fifty percent of the participants did proper practice of washing cereals and vegetables. Overall, everyone had different pattern of food habit and it shows that much work has to be done in the field of health dimension with the help of

education and motivation and through implementation of healthy life style behaviour in terms of nutrition and its monitoring from time to time.

### Conflict of interest

All authors declare that they have no conflicts of interest.

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