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Dietary Diversity and Nutrient Adequacy among Anganwadi Children with Special Reference to Protein and Iron: A Study in Bhagalpur, Bihar

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Abstract

Background: Adequate dietary diversity during early childhood is essential for meeting requirements for energy, protein and micronutrients. Children attending Anganwadi Centres constitute an important nutritionally vulnerable population in India. Protein and iron are of particular concern because insufficient protein intake may compromise growth and tissue development, while inadequate iron intake can contribute to iron deficiency and anaemia. Bhagalpur district of Bihar presents an important setting for studying these issues because available population-level evidence indicates considerable nutritional vulnerability among young children.

Objectives: The study aimed to assess dietary diversity among Anganwadi-enrolled children in Bhagalpur, estimate their protein and iron intake in relation to age-specific recommended dietary allowances, identify major dietary sources of protein and iron, and examine the association between dietary diversity and nutrient adequacy.

Methods: A cross-sectional dataset representing 300 Anganwadi-enrolled children aged 24–71 months was developed for methodological illustration. Dietary intake was assessed using a 24-hour dietary recall and a qualitative food-frequency schedule. Seven food groups were used to construct a Dietary Diversity Score (DDS): cereals/roots/tubers; pulses, legumes and nuts; milk and milk products; flesh foods; eggs; vitamin-A-rich fruits and vegetables; and other fruits and vegetables. Consumption of four or more groups was classified as relatively higher dietary diversity for this preschool study. Nutrient values were derived using the *Indian Food Composition Tables 2017*, while nutrient adequacy ratios were calculated against age-specific ICMR-NIN recommendations.

Results: The mean DDS was 4.06 ± 1.46 food groups, and 65.3% of children consumed foods from at least four groups during the preceding 24 hours. Cereals and starchy staples were consumed by 95.7% of children, followed by dairy products (60.7%), pulses/legumes/nuts (58.7%), other fruits and vegetables (55.0%), vitamin-A-rich fruits and vegetables (53.0%), eggs (46.0%) and flesh foods (37.3%). Mean protein intake was 14.46 ± 4.04 g/day and mean iron intake was 7.17 ± 2.57 mg/day. Overall, 56.0% of children attained the age-specific RDA for protein, whereas only 22.0% attained the RDA for iron. Children with higher dietary diversity had significantly greater protein intake (16.34 ± 3.30 vs. 10.93 ± 2.75 g/day; $p<0.001$) and iron intake (8.28 ± 2.19 vs. 5.08 ± 1.86 mg/day; $p<0.001$). DDS showed positive correlations with protein intake ($r=0.777$, $p<0.001$) and iron intake ($r=0.663$, $p<0.001$).

Conclusion: The findings suggest that dietary diversity may be strongly associated with improved protein and iron intake among Anganwadi children. While protein intake appeared comparatively satisfactory, iron emerged as a more critical dietary gap. Strengthening Anganwadi meals through pulses, eggs or other culturally acceptable animal-source foods, green leafy vegetables, iron-rich local foods, fortified staples and vitamin-C-rich foods may improve overall nutrient quality.

Keywords: Anganwadi children; dietary diversity; nutrient adequacy; protein; iron; Bhagalpur; Bihar; preschool nutrition; complementary feeding; POSHAN 2.0.

1. Introduction

Early childhood is a period of rapid physical growth, neurological development, immune maturation and behavioural development. The quality of food consumed during this stage has both immediate and potentially long-lasting consequences. A child may consume an apparently adequate quantity of food and still experience nutrient deficiencies if the diet is dominated by a limited number of staple foods. Dietary diversity is therefore increasingly used as a practical indicator of dietary quality and potential micronutrient adequacy.

The World Health Organization recommends that young children receive nutritionally adequate, safe and diverse diets. Current WHO guidance for children aged 6–23 months emphasizes dietary variety together with regular consumption of animal-source foods, fruits and vegetables, and frequent consumption of pulses, nuts and seeds, particularly where animal-source foods are limited (WHO, 2023). WHO and UNICEF define minimum dietary diversity for children aged 6–23 months as consumption from at least five of eight specified food groups during the previous day (WHO and UNICEF, 2021). Although this exact indicator is designed for children below two years of age, the broader principle that food-group diversity reflects diet quality is also useful in nutritional assessment of preschool children.

Indian evidence has demonstrated substantial variation in the foods consumed by young children. Beckerman-Hsu *et al.* (2020), analysing more than 73,000 Indian children, observed that children failing to achieve minimum dietary diversity had particularly low consumption of fruits, vegetables and protein-rich foods. Importantly, even some children meeting the diversity criterion had limited consumption of protein-rich food groups, indicating that the number and type of foods both require attention.

The nutritional situation is particularly relevant in Bihar. NFHS-5 reported that only 10.9% of Bihar's children aged 6–23 months received an adequate diet, while 42.9% of children under five were stunted and 41.0% were underweight. District-level data for Bhagalpur provide an even more specific rationale: the NFHS-5 district fact sheet reported that only 8.1% of children aged 6–23 months received an adequate diet, while 40.0% of children under five were stunted and 40.4% were underweight.

Iron nutrition is an additional concern. NFHS-5 data indicate that approximately 69.4% of Bihar's children aged 6–59 months were anaemic. District-wise NFHS-5 figures subsequently reported to Parliament indicate anaemia among 78.7% of children aged 6–59 months in Bhagalpur. Anaemia is multifactorial and should not be equated directly with inadequate dietary iron; nevertheless, such a high prevalence makes the quality, quantity and bioavailability of dietary iron an important area for nutritional investigation.

Protein is essential for synthesis and maintenance of body tissues, enzymes, hormones, immune components and other physiological structures. Preschool children require adequate amounts of good-quality protein because of their high growth demands relative to body size. In Indian households, protein commonly comes from combinations of cereals and pulses, milk, curd, legumes, groundnuts, eggs, fish and meat. The contribution of each source depends on household income, food availability, cultural practices and the meals provided through public nutrition programmes.

Iron is needed for haemoglobin synthesis, oxygen transport, energy metabolism and neurological development. Sources available in Bihar include pulses, lentils, chickpeas, green leafy vegetables, sesame seeds, certain millets, eggs, fish, meat and fortified foods. Iron from plant sources generally has lower bioavailability than haem iron from animal-source foods, making meal composition important in addition to total iron content.

India's Anganwadi system has a major role in improving the nutrition of young children. Under Mission Saksham Anganwadi and POSHAN 2.0, nutritional support is provided for children from six months to six years of age. The programme guidelines prescribe supplementary nutrition norms of approximately 500 kcal and 12–15 g protein per beneficiary per day for children aged 6–72 months and encourage quality protein, dietary diversity, fresh produce, fortified rice and millets.

The relevance of such research to Bhagalpur is also supported by earlier local work. Kumar and Prasad (2011), in a study of 200 rural Anganwadi children in Bhagalpur, reported substantial undernutrition and dietary inadequacy and highlighted low protein and energy intake as areas of concern. Although programme conditions and nutritional standards have evolved since that study, it provides useful historical evidence that the dietary quality of Anganwadi children has long been an important local issue.

The present paper therefore focuses specifically on dietary diversity and the adequacy of protein and iron among preschool children enrolled in Anganwadi Centres of Bhagalpur.

1.1 Objectives

The objectives were to assess the dietary diversity of Anganwadi-enrolled children aged 2–5 years; determine the frequency of consumption of major protein- and iron-rich food groups; estimate daily protein and iron intake; compare nutrient intake with age-specific ICMR-NIN recommendations; and examine the relationship between dietary diversity and protein and iron adequacy.

1.2 Hypotheses

H_{01}: Dietary diversity is not significantly associated with protein adequacy among Anganwadi children.

H_{11}: Higher dietary diversity is significantly associated with greater protein adequacy among Anganwadi children.

H_{02}: Dietary diversity is not significantly associated with iron adequacy among Anganwadi children.

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H_{12}: Higher dietary diversity is significantly associated with greater iron adequacy among Anganwadi children.

2. Materials and Methods

2.1 Study population and sample

The simulated sample consisted of **300 children aged 24–71 months** enrolled in 20 Anganwadi Centres located in rural and urban areas of Bhagalpur.

The age group was selected because children between two and five years commonly consume predominantly family foods, making quantitative dietary recall and comparison of food groups particularly informative.

2.2 Hypothetical sampling procedure

A multistage sampling approach was assumed. Anganwadi Centres were first selected from rural and urban areas, followed by systematic selection of eligible children from centre registers. Fifteen children were assumed to have been selected from each of 20 centres, giving a total sample of 300.

2.3 Dietary assessment

Dietary information was conceptually collected from mothers or primary caregivers by a structured interview. A single 24-hour dietary recall was used to record all foods and beverages consumed by the child during the preceding day, including household foods and supplementary food received from the Anganwadi Centre.

Standard household measures such as bowls, cups, spoons and serving units were assumed to have been converted into gram quantities.
Food nutrient composition was estimated using the *Indian Food Composition Tables 2017*, published by the National Institute of Nutrition. The IFCT database contains analytically derived composition information for hundreds of commonly consumed Indian foods and includes protein, minerals and other nutrients (Longvah *et al.*, 2017).

2.4 Dietary Diversity Score

Seven food groups were considered:

1. cereals, roots and tubers;
2. pulses, legumes, nuts and seeds;
3. milk and milk products;
4. meat, fish and poultry;
5. eggs;
6. vitamin-A-rich fruits and vegetables; and
7. other fruits and vegetables.

One point was assigned for consumption of each food group during the previous 24 hours, producing a DDS ranging from 0 to 7.

Because the WHO 2021 MDD definition of ≥5 out of 8 food groups is specifically intended for children aged 6–23 months, it was **not** directly applied as an official MDD criterion to these 2–5-year-old children. Instead, a study-specific descriptive classification was used:

Lower diversity: fewer than four food groups.

Higher diversity: four or more food groups.

This classification was used only for the analytical comparison.

2.5 Assessment of protein and iron

Daily protein and iron intake was estimated from all foods reported in the hypothetical 24-hour recall.

Age-specific requirements were based on ICMR-NIN recommendations for Indian children. The ICMR-NIN nutrient requirement framework provides Estimated Average Requirements and Recommended Dietary Allowances for age and physiological groups and is the principal national reference for evaluating Indian diets (ICMR-NIN Expert Group, 2020).

The Nutrient Adequacy Ratio was calculated as:

NAR = Observed daily intake / Age-specific RDA

For descriptive purposes:

NAR ≥1.00 = RDA attained

NAR <1.00 = RDA not attained

Use of the RDA threshold in this simulated study represents achievement of the recommended intake rather than a clinical diagnosis of deficiency. Population prevalence of inadequate intake is ideally assessed against appropriate EAR distributions when suitable repeated dietary measurements are available.

2.6 Statistical analysis

Data were summarized using frequencies, percentages, means and standard deviations. Independent-samples *t*-tests were used to compare nutrient intake between lower- and higher-diversity groups. Chi-square tests were used to examine associations between diversity category and achievement of the RDA. Pearson's correlation coefficients were calculated between DDS and continuous protein and iron intake.

Statistical significance was considered at $p<0.05$.

3. Results

3.1 Characteristics of the simulated sample

The mean age of the children was 47.3 ± 13.9 months. Girls constituted 52.7% and boys 47.3% of the sample. Approximately two-thirds (65.3%) were from rural households.

Table 1. Socio-demographic characteristics of the Anganwadi children (N=300)

Characteristic	Number	Percentage
Age (months)		
24–35 months	77	25.7
36–47 months	70	23.3

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48–59 months	80	26.7
60–71 months	73	24.3
Sex		
Boys	142	47.3
Girls	158	52.7
Residence		
Rural	196	65.3
Urban	104	34.7
Maternal education		
None/Primary	110	36.7
Middle/Secondary	131	43.7
Higher secondary and above	59	19.7
Socio-economic category		
Low	129	43.0
Middle	142	47.3
Higher	29	9.7

3.2 Consumption of different food groups

Cereals, roots and tubers were consumed by almost all children (95.7%). Dairy products and pulses/legumes/nuts were consumed by approximately three-fifths of the sample.

Egg consumption was reported for 46.0% of the children, whereas only 37.3% consumed meat, fish or poultry on the recall day. Thus, the diet appeared substantially more dependent on cereal-pulse combinations and dairy than on animal-source foods.

Table 2. Food-group consumption during the previous 24 hours

Food group	Number consuming	Percentage
Cereals, roots and tubers	287	95.7
Pulses, legumes, nuts and seeds	176	58.7
Milk and milk products	182	60.7
Eggs	138	46.0
Meat, fish and poultry	112	37.3
Vitamin-A-rich fruits and vegetables	159	53.0
Other fruits and vegetables	165	55.0

Note: Children could consume more than one food group; percentages therefore do not total 100.

3.3 Dietary Diversity Score

The mean dietary diversity score was:

4.06 ± 1.46 food groups.

The distribution showed that 12 children consumed only one food group, 38 consumed two, 54 consumed three, 71 consumed four, 75 consumed five, 40 consumed six and 10 consumed all seven food groups.

Overall:

104 children (34.7%) had lower dietary diversity (<4 food groups).

196 children (65.3%) had higher dietary diversity (≥4 food groups).

The findings illustrate that a substantial proportion of children could be consuming a reasonable number of food groups while still having limited access to nutrient-dense protein- and iron-rich foods.

3.4 Protein and iron intake

Mean daily protein intake was **14.46 ± 4.04 g**, whereas mean iron intake was **7.17 ± 2.57 mg**.

The average protein adequacy ratio was equivalent to approximately **109.7% of the age-specific RDA**, while mean iron intake represented approximately **77.4% of the age-specific RDA**.

However, adequacy at the individual level was substantially different:

56.0% attained the age-specific RDA for protein.

22.0% attained the age-specific RDA for iron.

Thus, iron represented a considerably larger dietary shortfall than protein in the simulated population.

Table 3. Protein and iron intake and RDA attainment

Nutritional indicator	Mean ± SD / Percentage
Dietary Diversity Score	4.06 ± 1.46
Protein intake (g/day)	14.46 ± 4.04
Protein intake as % of age-specific RDA	109.74 ± 37.74
Children attaining protein RDA	56.0%
Iron intake (mg/day)	7.17 ± 2.57
Iron intake as % of age-specific RDA	77.39 ± 31.12
Children attaining iron RDA	22.0%

3.5 Dietary diversity and nutrient intake

Children consuming four or more food groups had markedly greater protein and iron intake than children consuming fewer than four groups.

Mean protein intake increased from **10.93 ± 2.75 g/day** in the lower-diversity group to **16.34 ± 3.30 g/day** in the higher-diversity group.

Mean iron intake increased from **5.08 ± 1.86 mg/day** to **8.28 ± 2.19 mg/day**.

Both differences were statistically significant.

Table 4. Nutrient intake according to dietary diversity

Variable	**Lower diversity (<4 groups), n=104**	**Higher diversity (≥4 groups), n=196**	**Test**	***p*-value**
Protein intake (g/day)	10.93 ± 2.75	16.34 ± 3.30	t=15.10	<0.001
Iron intake (mg/day)	5.08 ± 1.86	8.28 ± 2.19	t=13.30	<0.001
Protein RDA attained	22.1%	74.0%	χ^2=72.09	<0.001
Iron RDA attained	1.9%	32.7%	χ^2=35.62	<0.001

These findings resulted in rejection of both null hypotheses in the analysis.

3.6 Correlation between dietary diversity and nutrient adequacy

Dietary diversity showed a strong positive correlation with protein intake:

DDS and protein: r=0.777, p<0.001.

DDS was also positively correlated with iron intake:

DDS and iron: r=0.663, p<0.001.

The association remained evident when nutrient intake was expressed relative to age-specific recommendations. DDS correlated positively with protein RDA percentage (r=0.669, p<0.001) and iron RDA percentage (r=0.625, p<0.001).

Table 5. Correlation of Dietary Diversity Score with protein and iron indicators

Nutritional variable	**Pearson's *r* with DDS**	***p*-value**
Protein intake (g/day)	0.777	<0.001
Iron intake (mg/day)	0.663	<0.001
Protein intake as % RDA	0.669	<0.001
Iron intake as % RDA	0.625	<0.001

4. Discussion

The present analysis demonstrates how dietary diversity may be related to protein and iron adequacy among preschool children enrolled in Anganwadi Centres in Bhagalpur. The central pattern is that diets containing a larger number of food groups were associated with substantially greater protein and iron intake.

The mean DDS of approximately four food groups indicates moderate diversity, yet the composition of that diversity deserves attention. Cereals were almost universally consumed, while pulses and dairy products were moderately common. Eggs and flesh foods were less frequently consumed. This pattern is consistent with the broader observation that Indian children’s diets may contain substantial quantities of cereal-based foods while nutrient-dense protein-rich foods remain less frequently consumed.

Beckerman-Hsu *et al.* (2020) similarly found that Indian children with inadequate dietary diversity had low intake of fruits, vegetables and protein-rich foods, while even children meeting the MDD threshold did not necessarily consume protein-rich foods in optimal proportions.

A multi-centre Indian study by Vispute *et al.* (2023) demonstrated that dietary diversity and food variety were positively correlated with micronutrient adequacy and haemoglobin among Indian children and adolescents. Although their age range differed from the present simulated preschool sample, the findings reinforce the usefulness of diversity as an indicator of overall dietary quality.

Similarly, a systematic review by Molani-Gol, Kheirouri and Alizadeh (2023) found that the studies reviewed consistently demonstrated a positive relationship between dietary diversity and micronutrient adequacy among children under five.

Indian preschool evidence nevertheless indicates that dietary diversity should not be treated as a complete substitute for quantitative dietary assessment. Nithya and Bhavani (2018), studying preschool children in two high-burden Indian districts, observed cereal-dominated dietary patterns and found relationships between 24-hour food scores and nutrient adequacy, but dietary diversity did not consistently predict anthropometric nutritional status. This distinction is important because growth outcomes are influenced by infection, sanitation, birth weight, health-care access and other factors in addition to food consumption.

4.1 Protein intake

Protein adequacy was comparatively better than iron adequacy in the simulated data. More than half of the children attained the age-specific protein RDA, while higher-diversity children showed considerably better protein intake.

This may be explained by the contribution of multiple food groups to dietary protein. Even in households with little meat consumption, cereals combined with pulses can provide substantial protein. Milk, curd, eggs, roasted gram, groundnuts and soybean can further improve protein quantity and quality.

The findings also have implications for Anganwadi meal planning. Mission Saksham Anganwadi and POSHAN 2.0 specifies 12–15 g protein as part of the supplementary nutrition norm for children aged 6–72 months and emphasizes local dietary inputs, quality protein, fresh vegetables, fruits, fortified rice and millets.

Therefore, nutritional improvement need not depend entirely on expensive foods. Appropriate cereal-pulse combinations together with locally acceptable eggs, milk, soybean, roasted chickpea, groundnuts and other protein-rich foods can improve dietary quality at relatively modest cost.

4.2 Iron intake

Iron was the more prominent dietary concern. Only 22.0% of children attained their age-specific RDA, compared with 56.0% for protein.

The importance of this finding is heightened by the broader anaemia burden in Bihar and Bhagalpur. NFHS-5 indicates a very high prevalence of anaemia among young children in Bihar, and Bhagalpur-specific NFHS-5 data report anaemia among 78.7% of children aged 6–59 months.

However, the present paper does not assume that all childhood anaemia in Bhagalpur is due to inadequate iron intake. Anaemia may arise from iron deficiency as well as infection, inflammation, other micronutrient deficiencies, haemoglobin disorders and other causes. Dietary assessment and haemoglobin measurement therefore answer different questions.

Nevertheless, low consumption of flesh foods and only moderate intake of pulses and green leafy or vitamin-A-rich vegetables suggest practical opportunities to improve iron density. Locally accessible foods such as lentils, Bengal gram, black gram, chickpeas, green leafy vegetables, sesame, groundnut, millets, eggs, fish and meat can contribute iron to children's diets. Fortified foods supplied through government programmes may provide additional support.

Combining plant-based iron sources with vitamin-C-rich foods such as guava, amla, citrus fruits, tomatoes and other locally available fruits and vegetables can also contribute to better utilization of non-haem iron.

4.3 Significance of dietary diversity

The strong correlations observed in the simulated dataset indicate that food-group diversity could serve as a practical first-level screening indicator. Children with very monotonous diets are more likely to be missing multiple nutrient sources simultaneously.

This is consistent with the systematic evidence linking greater dietary diversity to micronutrient adequacy in children under five (Molani-Gol *et al.*, 2023).

However, diversity alone does not guarantee adequacy. A child may consume a small quantity from several food groups and obtain a high DDS while receiving inadequate nutrient quantities. Conversely, a child consuming fewer groups may receive a relatively nutrient-dense diet in sufficient amounts. Dietary diversity should therefore complement, rather than replace, quantitative assessment.

4.4 Relevance to Bhagalpur

The study has particular relevance for Bhagalpur because local nutritional indicators remain challenging. NFHS-5 reported an adequate diet among only 8.1% of children aged 6–23 months in the district, although this indicator should not be compared numerically with the present preschool DDS because the age groups and definitions differ. The same district fact sheet reported stunting among 40.0% and underweight among 40.4% of under-five children.

The persistence of these indicators suggests a need for interventions extending beyond calorie provision. Meal quality, diversity, micronutrient density, feeding behaviour, household food access and caregiver nutrition knowledge are all relevant.

4.5 Implications for Anganwadi nutrition programmes

The results point towards several programme priorities. Anganwadi menus can be planned so that children receive multiple food groups across the week rather than a repetitive cereal-dominated meal. Pulses should remain a regular component, while eggs, milk or other locally acceptable high-quality protein foods can strengthen nutrient density.

Green leafy vegetables and seasonal vegetables may be included more regularly, and fortified rice can be used in accordance with programme provisions. Seasonal locally grown foods may simultaneously improve dietary diversity and control cost.

Nutrition education for mothers and caregivers should also emphasize practical combinations rather than merely listing nutrients. Families may find messages such as *dal-rice plus vegetables and fruit, roti-dal plus green leafy vegetables*, or *khichdi enriched with pulses, vegetables and egg where acceptable* easier to implement than abstract recommendations regarding grams of protein or milligrams of iron.

5. Recommendations

On the basis of the findings and supporting literature, Anganwadi nutrition programmes in Bhagalpur should place greater emphasis on **diet quality in addition to quantity**. Menus should regularly combine cereals with pulses and incorporate eggs, milk, soybean or other locally acceptable protein-rich foods. Iron-rich foods such as green leafy vegetables, pulses, lentils, sesame and fortified staples should be included more frequently, together with vitamin-C-rich fruits or vegetables.

Periodic dietary-diversity screening could be incorporated into nutrition counselling. Anganwadi Workers may use simple food-group checklists to identify children whose home diets are particularly monotonous. Caregiver education can focus on affordable locally available sources of protein and iron and on distributing these foods throughout the week.

Convergence between Anganwadi Workers, ASHAs, ANMs and families is also important. Children identified with poor dietary intake, poor growth or suspected anaemia should receive appropriate nutrition counselling, health assessment and referral in accordance with programme protocols.

6. Strengths and Limitations

A strength of the proposed analytical framework is the assessment of food-group diversity, quantitative nutrient intake and RDA attainment. The focus on protein and iron also addresses two nutritionally important components of children's diets.

A single 24-hour recall also cannot capture usual intake because children's food consumption varies from day to day. A real study would ideally obtain repeated recalls from a subsample or use an appropriate statistical adjustment for within-person variation.

Furthermore, attaining or failing to attain the RDA on one recall day is not equivalent to diagnosing nutrient adequacy or deficiency. The RDA is a recommended intake target, whereas estimation of population inadequacy is preferably based on EAR distributions and repeated intake data.

Finally, dietary iron intake is not synonymous with iron status or anaemia. A field study should ideally include haemoglobin estimation and, where resources permit, biomarkers such as serum ferritin together with markers of inflammation.

7. Conclusion

Dietary diversity represents an important component of nutritional quality among preschool children. In the sample of 300 Anganwadi-enrolled children from Bhagalpur, children consuming four or more food groups had substantially greater protein and iron intake than those consuming less diverse diets.

Protein adequacy was comparatively favourable, whereas iron intake remained a more substantial concern. The simulated findings are consistent with broader evidence suggesting that monotonous cereal-dominated diets can limit micronutrient adequacy even when basic food intake is available.

The study therefore highlights the potential value of strengthening dietary diversity within both Anganwadi supplementary nutrition and household feeding practices. Greater inclusion of pulses, dairy products, eggs or other acceptable animal-source foods, green leafy vegetables, seasonal fruits and vegetables, fortified foods and locally available iron-rich foods may improve nutritional quality.

For Bhagalpur, where NFHS data indicate substantial child malnutrition and anaemia, a field-based study using actual dietary recalls, anthropometric measurements and biochemical assessment would be valuable. Such research could provide locally specific evidence for improving Anganwadi menus, caregiver counselling and child-nutrition interventions.

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