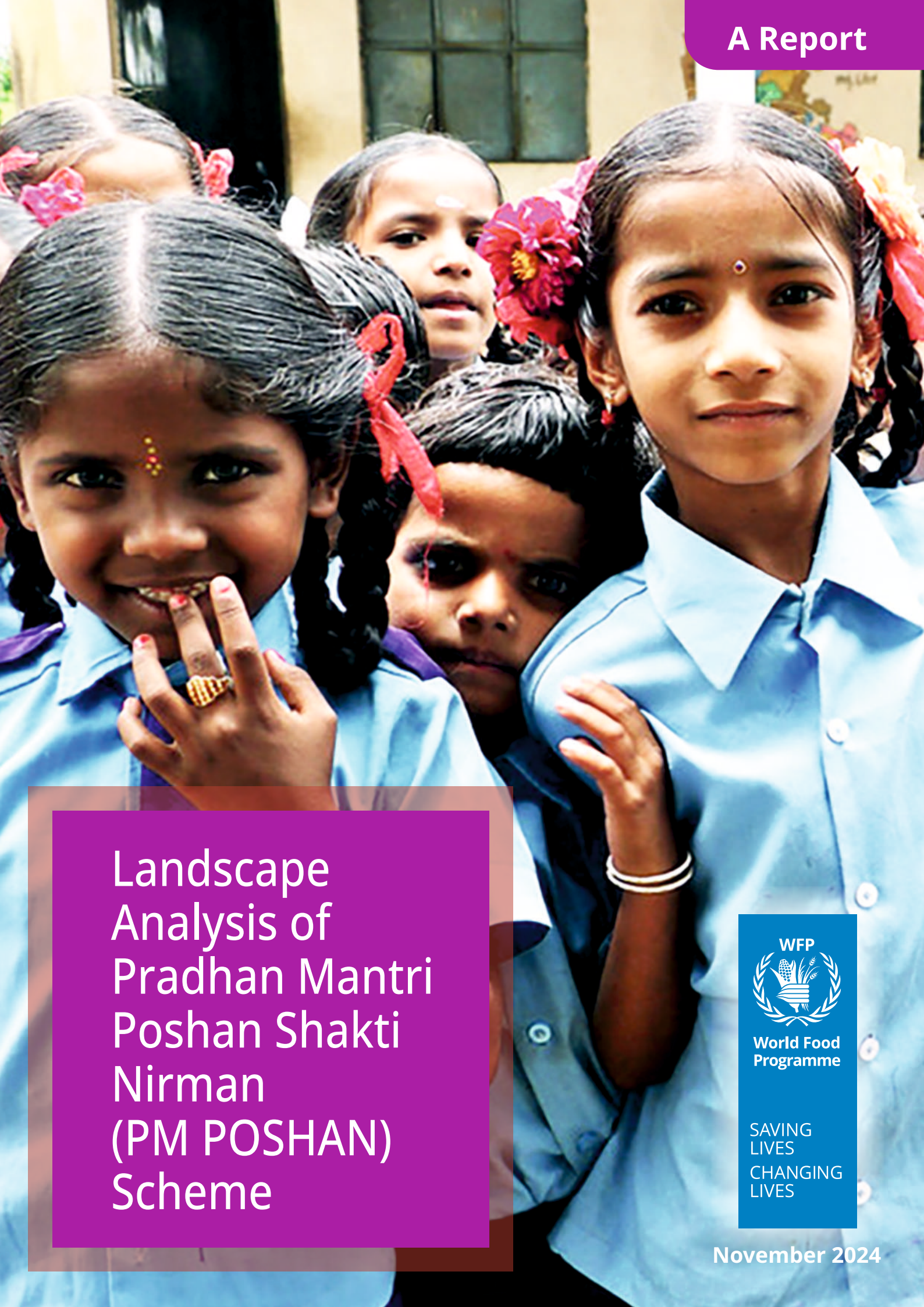
A Report



Landscape Analysis of Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Scheme

WFP
World Food Programme

SAVING LIVES
CHANGING LIVES

November 2024

LANDSCAPE ANALYSIS OF PRADHAN MANTRI POSHAN SHAKTI NIRMAN (PM POSHAN) SCHEME

A Report

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Disclaimer: The analysis presented in the publication was put together based on data collected from self-administered questionnaires and telephonic interviews with government functionaries across States as well as desk research.

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Foreword

School feeding programmes are instrumental for overall development of school-age children and adolescents. It is a well-established fact that a thoughtfully designed and well implemented school feeding programme can act as a powerful social safety net to ensure nutrition and food security for the school aged children. Along with the nutritional benefits, it also supports the educational indicators viz. access, participation, achievement, performance of the children in school. School feeding programme combines both the short term and long terms outcomes to ensure human capital development process which is essential for growth and economic development of a country.

Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) programme (earlier Mid-day Meal Scheme) is the world's largest school meal programme. In India, the National Programme of Nutritional Support to Primary Education (NP-NSPE) was launched in August 1995 as a dry ration scheme. Subsequently, over the years it has been successfully implemented across the country with the provision of serving hot cooked meal to children studying in elementary classes (from Pre-Primary to grade VIII) in government and government aided schools on every school days. Apart from the well-established legal framework and precise guidelines for this scheme, political willingness of the government and sustained fiscal provision has proven to be important in its successful implementation of this programme over decades. Besides provision of meals, other interwoven health and hygiene services are provided. To address micronutrient deficiencies among children, the Government has also initiated fortification of rice supplied under this scheme.

The United Nations World Food Programme (WFP) recently conducted a landscape analysis of the PM POSHAN menu and related factors across the country. The study provides some interesting analysis and observations about the PM POSHAN norms, menu, menu planning, preparation etc, across the states based on comparison of PM POSHAN food and nutritional norms with other recommended norms in India, provision of additional food items by different State/ Union Territories (UTs) other implementation aspects, few best practices etc. Furthermore, it also provides some well thought through recommendations for further improvement of the scheme. This document would be a useful reference for the practitioners and researchers who are interested in the school feeding programme of India.

It gives me immense pleasure to write a foreword for the *'Landscaping Analysis of Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Menu – A Report'* with the expectation that the findings and recommendations of this report would support the National and State/UT governments for further fine tuning the PM POSHAN scheme and its implementation to achieve its ultimate goals and benefit for our future generations.

(Vinod Paul)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Preface

School meals are an essential safety net which helps to ensure that every child has access to education, health, and nutrition. In the fight against hunger, school meals are sound investment in the next generation and a country's human capital - thus improving their future economic growth and development prospects. School meals contribute directly to Sustainable Development Goal (SDG) 2 (Zero hunger), SDG 4 (Quality Education) and SDG 5 (Gender equality) and indirectly to SDG 1 (No poverty), SDG 8 (Decent work and economic growth) and SDG 10 (Reduced inequalities).

In India, the PM POSHAN scheme covers all children between the age of 6-14 years studying in Government, Local Body and Government-aided primary and upper primary schools and the Education Guarantee Scheme/Alternative and Innovative Centres supported under Sarva Shiksha Abhiyan (SSA) across the country. The scheme is largely focussed on enhancing enrolment, retention & attendance and simultaneously improving the nutrition status of school going children.

To improve nutrition, the scheme prescribes caloric and protein norms for the meals to be served to school children and these norms are further converted into food entitlements. However, the genesis of this scheme dates to the period when food insecurity was still a concern in the country and therefore, it is largely committed to filling gaps in intakes of energy and protein compared to requirements. Given the overall improvement in India's food security and given the extensive coverage of the PM POSHAN scheme, it is important to seek a new balance in its overall objectives with a greater focus on nutrition security by addressing both under and overnutrition while serving as a learning tool for healthy diets so that children

receiving school meals have the knowledge to influence similar healthy meals at home.

It is with this intention that the report of "Landscape Analysis of Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Scheme" has been crafted and I hope this will serve as a useful resource for Governments at both the National and State level to further diversify school meals for improved child nutrition.

Elisabeth Faure

Representative and Country Director

World Food Programme, India

Acronyms

AMDR	Acceptable Macronutrient Distribution Range
BMI	Body Mass Index
CCH	Cook Cum Helper
CHO	Carbohydrates
CMBFS	Chief Minister's Breakfast Scheme
CNNS	Comprehensive National Nutrition Survey
CVD	Cardiovascular Diseases
DIAAS	Digestible Indispensable Amino Acid Score
EAR	Estimated Average Requirements
FAO	Food and Agriculture Organization
FSSAI	Food Safety and Standards Authority of India
GLV	Green Leafy Vegetable
GoI	Government of India
HDL-C	High-Density Lipoprotein-Cholesterol
IAP	Indian Academy of Paediatrics
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research
IFA	Iron Folic Acid
KVK	Krishi Vigyan Kendra
LDL-C	Low-Density Lipoprotein-Cholesterol
LMIC	Lower Middle-Income Countries
MDM	Mid Day Meal

MUFA	Mono Unsaturated Fatty Acids
NaFeDTA	Sodium Iron Ethylene Diamine Tetra Acetate
NFHS	National Family Health Survey
NFSA	National Food Security Act
NGO	Non-Governmental Organization
NIN	National Institute of Nutrition
PDS	Public Distribution System
PLF	Panchayat Level Functionary
PM POSHAN	Pradhan Mantri Poshan Shakti Nirman
PUFA	Polyunsaturated Fatty Acids
n-3 PUFA	Omega-3 Polyunsaturated Fatty Acids
n-6 PUFA	Omega-6 Polyunsaturated Fatty Acids
RDA	Recommended Dietary Allowances
RTC	Ready to Cook
RTE	Ready to Eat
SDG	Sustainable Development Goal
SFA	Saturated Fatty Acids
SMC	School Management Committee
STC	Special Training Centre
TC	Total Cholesterol
T2DM	Type-2 Diabètes Mellitus
UT	Union Territory
WFP	World Food Programme
WHO	World Health Organization

Glossary

Recommended Dietary Allowance	It is the average daily amounts of essential nutrients estimated, based on available scientific knowledge, to be sufficiently high to meet the physiological needs of practically all healthy persons in a group with specified characteristics.
Estimated Average Requirement	It is the average daily level of intake estimated to meet the requirements of 50% of healthy individuals; usually used to assess the nutrient intakes of groups of people and to plan nutritionally adequate diets for them; can also be used to assess the nutrient intakes of individuals.
Acceptable Macronutrient Distribution Range	It is the range of intake for a particular energy source that is associated with reduced risk of chronic disease while providing intakes of essential nutrients.
Digestible Indispensable Amino Acid Score	DIAAS allows for the calculation of the amino acid quality of food proteins that are based on ileal digestibility rather than total tract digestibility and values for each amino acid may be calculated.
Sukhdi	Authentic Gujarati sweet made with jaggery *(gud* or *gol*), ghee (clarified butter), and *atta* (whole wheat flour).
Ragi Java	Sweetened porridge made from finger millet, jaggery, and water/milk.
Chikki	It is a sweet brittle snack, made with jaggery/sugar, peanuts/chana.
Upma	South Indian breakfast made with cream of wheat or semolina flour (called *rava* or *suji* locally), veggies, spices, and herbs.
Pongal/Khichdi	It is a rice and lentil porridge.
Lapsi	A sweet dish made using grain flour or broken wheat or millet and ghee (clarified butter), along with milk, nuts, raisins, and other dried fruits.

Ladoo	These are sweetened round balls made from flour, sugar, and ghee or oil.
Usal	Savoury curry made with sprouted beans, stir-fried along with onions, spices, and curry leaves in oil.
Muthiya	Muthiya is a steamed or fried snack from Gujarat made with gram flour or veggies.
Idli	Idli is a type of savoury rice cake, originating from the southern region of India.
Appam	Savory thin pancakes made with fermented rice batter and coconut milk.
Gulgule	These deep-fried sweets are made with whole wheat flour, sugar or jaggery, mashed banana, and fennel seeds.
Puri	Indian fried bread made with wheat flour, salt, and water.
Kheer/Payasam	Kheer, also known as payasam or payesh, is a pudding/porridge usually made by boiling milk, sugar, or jaggery, and rice/vermicelli.
Suji Halwa	North Indian sweet made with fine semolina or cream of wheat (farina), sugar, ghee.
Dheero	It is thick porridge or mush, made by cooking stone-ground cornmeal (*ghatta maa pidheko makai ko pitho),* millet flour (kodo ko pitho), or buckwheat flour (*phaapar ko pitho*) with salt and water.
Kutki	It is a medicinal plant.
Meetha Puda	It is a sweet, slightly crispy pancake.

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Executive Summary

School feeding programmes like the PM POSHAN scheme hold great significance in terms of contributing to national development by providing a nurturing environment during school age. The school feeding programmes can support children's education and nutrition in a two-pronged manner: firstly, by bolstering access and engagement (including enrolment, attendance, and averting dropouts) and secondly, by enhancing their learning capabilities (including attention and cognition) through improved intake of essential macro and micronutrients. Evidence suggests that the meals provided in schools have a dramatic positive effect on learning achievement. Studies revealed that exposure to mid day meals for nearly five-year duration of Primary school increases test scores by 18% for reading and 9% for Maths relative to children with less than a year of exposure.

In India, 33 percent of the population is under 18 years and of this, 20 percent is constituted by school-age children which represents the future workforce of the country. The Comprehensive National Nutrition Survey (CNNS 2016-2018) which reflects the malnutrition situation of young children and adolescents reports that on an average 1 in 3 children suffer from chronic undernutrition and almost 1 in 5 children suffer from acute malnutrition or wasting. The CNNS report also highlights significant micronutrient deficiencies in school-age children suggesting that malnutrition is a major problem that affects children beyond the 1,000-day window. Thus, dedicated efforts must be taken to prevent it. Malnutrition during school age can lead to high absenteeism, early dropout, poor academic performance, delayed cognitive development, short stature, health issues, and poor prospects.

To tackle the multifaceted issues of hunger and education simultaneously, the Government of India (GoI) has devised a comprehensive school meal programme known as the Pradhan Mantri Poshan Shakti Nirman (PM POSHAN), erstwhile Mid Day Meal Scheme. It is also the most extensive school meal programme globally, assisting 118 million students across India. The scheme is implemented through the designing and execution of a well-structured daily menu. This has been one of the critical features enforced by the Government to ensure quality and effectiveness in the implementation of the scheme. The menu is thoughtfully designed at the State level in consultation with experts and is aligned with the food norms, local food preferences, and the utilization of locally available food items.

Given that India's school feeding programme is one of the oldest programmes that envisions improving nutritional status alongside education indicators, World Food Programme (WFP) undertook a comprehensive study to map the menus offered across the nation under the

PM POSHAN scheme and assess them through a rigorous nutritional lens. The overarching objective of this study is to provide an unbiased assessment of the nutritional and dietary standards and norms within PM POSHAN and its implementation at the State level. The document also attempts to record the diverse practices employed by various States and Union Territories (UTs) in meal planning, preparation, and distribution and, to offer well-informed recommendations for enhancing menu diversity and nutritional value. The landscape study assesses the implementation of the PM POSHAN menus across 36 States and UTs from a nutrition lens. To ensure robustness in the data collection and analysis, a detailed framework was developed and executed.

A few challenges were observed while conducting data collection including the need for repeated follow-ups, incomplete information, etc. However, despite these challenges and limitations, requisite information was received through repeat follow-ups and alternate methods of validation which included telephonic interviews with the nodal officers, and a study of the States' annual progress reports on PM POSHAN and minutes of Project Approval Board meetings.

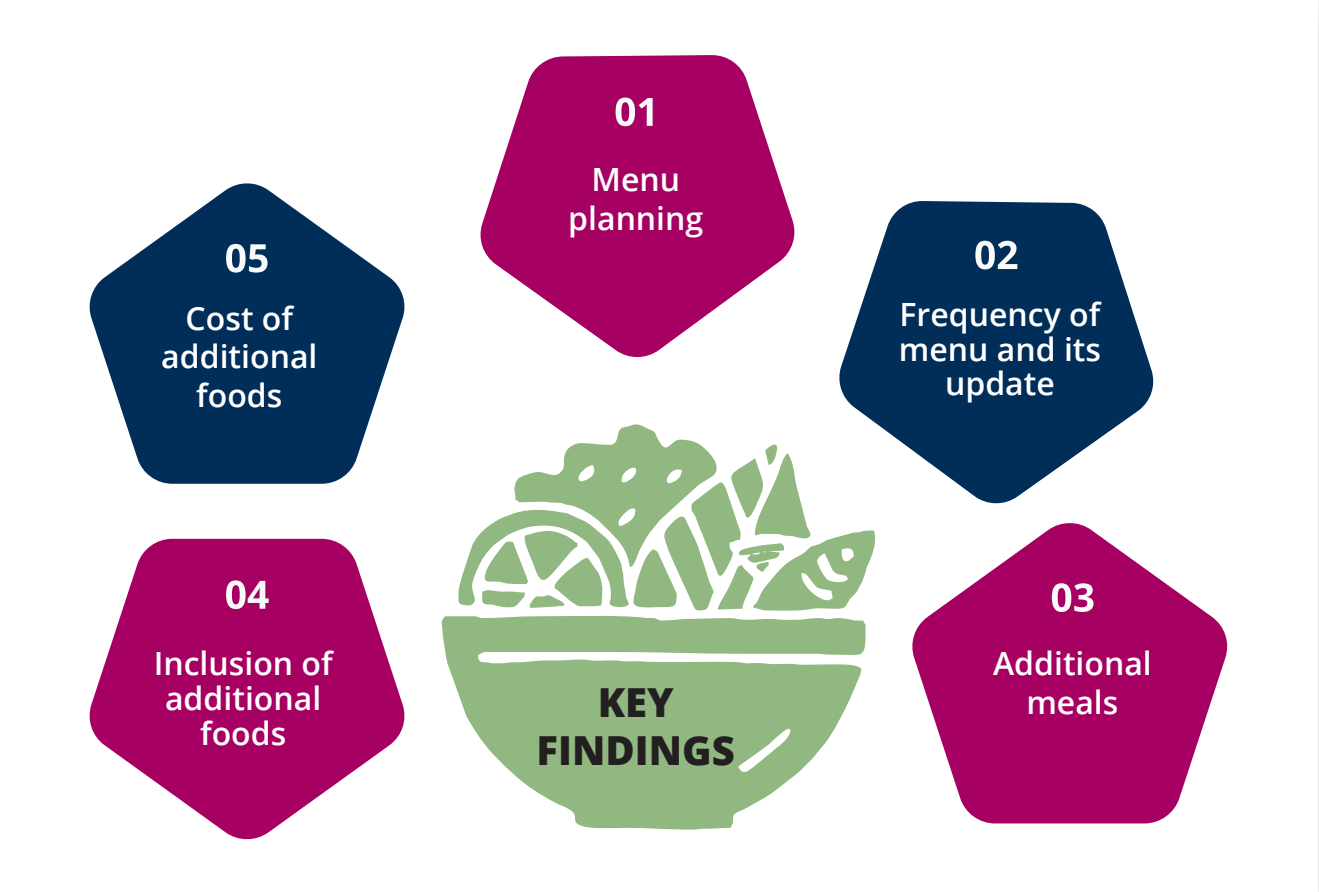
KEY INSIGHTS FROM THE REPORT

PM POSHAN norms and recommended nutritional norms: The analysis compared the PM POSHAN nutrition and food norms for school meals with Recommended Dietary Allowances (RDA) for one meal (a third of RDA/EAR) and it was observed that there were several variations. The same are tabulated below:

Food Groups	Primary Children			Upper Primary Children		
	Food norms as per EAR/ RDA	PM POSHAN Norms	Difference	Food norms as per EAR/ RDA	PM POSHAN Norms	Difference
Cereals (g)	60	100	+40	103	150	+47
Vegetables (all types) (g)	92	50	-42	133	75	-58
Fruits (g)	19.1	0	-19.1	33.3	0	-33.3
Fats and oils	7.5	5	-2.5	11.6	7.5	-4.1
The primary source of fat/oil in the school meal is cooking oil and there is no focus on using invisible source of fats which are rich in omega 3 fatty acids.						
Nutrients						
Energy (Kcal)	453 to 566	450	-3 to -116	686 to 953	700	+14 to -253
Proteins (g)	6.5	12	+5.5	12.7	20	+7.3
However, a typical PM POSHAN meal also has a lower Digestible Indispensable Amino Acid Score (DIAAS) value, ranging around 60-70% suggesting a need to include good quality animal source proteins, or soy proteins.						
Iron (mg)	3.5*	3.52**	+0.02	5.5*	5.28**	-0.22
Folate (µg)	50*	17**	-33	75*	25.5**	-49.5
Vit B12 (µg)	0.66*	0.1**	-0.56	0.66*	0.15**	-0.51

**Norms as per NFSA (2023), **Provided via fortified rice*

STATE-LEVEL IMPLEMENTATION OF THE PM POSHAN SCHEME



1. **MENU PLANNING:** The menu for the PM POSHAN meals is mostly planned at the level of the State, with 75% of States planning menus at the State level with flexibility given at district and school level to adjust the ingredients of recipes from within the food groups based on local preferences, availability of vegetables/oil/pulses in local markets, season, and cost.

2. **FREQUENCY OF MENU AND ITS UPDATE:** Almost all States (92% or 33 States) have weekly menus, while the States of Arunachal Pradesh, and Tamil Nadu repeat the menu every fortnight. The menus once fixed are not updated for extended period.

3. **ADDITIONAL MEALS:** It was observed that some States and UTs (7) are taking special initiative to include additional meals especially breakfast in an attempt to provide wholesome nutrition to the children. The frequency of breakfast varies from three days per week in Andhra Pradesh and Telangana to six days per week in Gujarat and Tripura. Tamil Nadu has a scheme called the Chief Minister's Breakfast Scheme for Primary children.

4. **INCLUSION OF ADDITIONAL FOODS:** It was observed that around 75% of the States and UTs (27) have introduced different foods in addition to the prescribed food norms set by GoI.

   - **Milk:** Milk is supplied as an additional food item by 31% of the (11) States and UTs. Among these 11 States and UTs, Chhattisgarh, Dadra Nagar Haveli, and Goa provide milk exclusively in specific districts or *Talukas*. The type of milk offered varies from skimmed milk powder

to freshly boiled milk to flavoured milk to dairy whitener. The type of milk preparation offered has implications on the overall health of children as many States add high quantities of sugar into these preparations and the composition of all milk substitutes is not alike.

- **Eggs:** Eggs as an additional source of protein in school meals, are offered by a total of 17 States (16) and UT (1). The frequency of provision of eggs varies from once per week to six times per week in these States and UT. Banana is provided as an alternative to eggs in four states to those children who do not consume eggs.
- **Millets:** A few States have attempted to introduce diversity through Millets. While States like Andhra Pradesh, Chhattisgarh, Haryana, and Telangana are providing millet-based foods across the States, there are another six States (Tripura, Bihar, West Bengal, Sikkim, Goa, Karnataka) that provide millets in specific pockets.
- **Fortified foods:** Fortified rice in place of regular rice has been supplied across all States/UTs since the approval of the scheme on the supply of fortified rice in Targeted Public Distribution System and other food-based safety net programmes. States/UT like Delhi, Gujarat, Himachal Pradesh, Odisha, and Tamil Nadu provide double-fortified salt – fortified with iodine and iron.
- **Additional sweet recipes:** A few States also include traditional sweet recipes, on the menu as a special treat for children. Eight States provide sweet dishes as part of the PM POSHAN scheme. The frequency of providing these sweet dishes may be about three times per week in some of the States.

5. **COST OF ADDITIONAL FOODS:** The cost incurred by the States to provide one hot cooked meal each school day is within the norms of Rs. 5.45 for Primary and Rs. 8.17 for Upper Primary (per child per day). However, it has been observed that the States and UTs that provide additional foods to supplement the regular meals meet the fund requirements through different sources.

Our analysis seems to suggest that while the PM POSHAN scheme holds immense potential to make an impact on children's nutritional status and can considerably contribute towards reducing malnutrition by bridging the nutritional gaps, there are notable challenges in nutritional and food norms that are currently prescribed under the PM POSHAN scheme that limits the realization of its full impact. There exists the opportunity to revisit the food norms and PM POSHAN menus in alignment with the revision of the nutritional standards for food-based safety nets including school meals in NFSA as well as the RDA/EAR, which defines average daily requirements for all age groups in 2023.

KEY RECOMMENDATIONS

1

Enhance the focus of the PM POSHAN scheme on nutrition

While the PM POSHAN scheme already has nutrition as an objective, there is more required in terms of the scheme's nutrition/ food norms and its on-ground implementation for full realization of this objective.

2

Increase the cost norms per child

There are enough evidence to suggest that school feeding programmes have a high return on investment, therefore, it is recommended that the per child cost norms under the PM POSHAN scheme may be increased to provide a diverse and more nutritious meal to the children.

3

Share best practices on healthy school meals

Considering that the implementation of the PM POSHAN scheme is decentralized, and different states attempt to provide the best possible nutrition solution within the limited resources with the support of technology and innovation, it is crucial that the unique, yet successful practices of the states is documented as best practices on healthy school meals and are widely disseminated to other States/UTs for replication.

4

Improve the quality and diversity of school meals

Food norms must be revised to reduce cereal dominance, avoid processed foods, and diversify diets – to include fruits, green leafy vegetables, and better-quality fats and proteins. The addition of fortified foods beyond rice, and nutritious grains such as millets may be considered to fulfil micronutrient norms laid out in the NFSA Gazette. Periodic revision of menus is advised to avoid monotony and guidance may be issued to States on foods that can be introduced as nutritional supplements including millet-based recipes.

5

Regularly assess students' nutritional status

To align with the objective of the scheme and measure the nutritional impact of the school meals being provided to school children, it is imperative to make the assessment of nutritional and health status a periodic activity to be repeated every three years. The department can consider anthropometric assessment using body mass index (BMI) alongside some biomarkers such as Hb level, serum retinol, Vitamin B12, and Vitamin D levels to assess the prevalence of micronutrient deficiencies. The assessments would also be helpful for the policymakers to make necessary adjustments in the scheme for optimizing the benefits for school children.

WAY FORWARD

In view of the role that the meals served at school can play in meeting the nutritional requirements of school children, correcting gaps in intake, establishing nutritional behaviours etc, there is a need for more studies on the various aspects of the PM POSHAN scheme and this particular age group of children.

UNLOCKING THE POTENTIAL

The Vital Role of School Feeding

BACKGROUND

While the nutrition interventions in the first 1,000 days of life are well-recognized in the policies and programmes in many countries, there is a historical neglect of health and nutrition during middle childhood (5-9 years of age). The school age years, which typically span from around 6 to 18 years of age, consist of several sensitive phases that shape the development of an individual. Thus, investment to support health and nutrition for these periods is essential to sustain early gains, provide catch-up opportunities, and address critical phases of vulnerability throughout childhood and adolescence.

School-age children typically fall within this time span and can be classified into three phases requiring special attention. These include:

- Middle childhood growth and consolidation phase (5-9 years), when infection and malnutrition constrain growth and mortality is higher than previously recognised.
- Adolescent growth spurt (10-14 years), when substantial physical and emotional changes require a good, healthy diet.
- Adolescent phase of growth and consolidation (ages 15 years to early 20s), when new responses are needed to support brain maturation, intense social engagement, and emotional control.

Ensuring optimal nutrition is important during all these phases as malnutrition during school age can lead to high absenteeism, early dropout, poor academic performance, delayed cognitive development, short stature, health issues, and poor prospects[1]. A nurturing environment, and age-appropriate and condition-specific support during this period can have a lasting impact on a child's overall development and future success. [2]

1. Zerga AA, Tadesse SE, Ayele FY, Ayele SZ. Impact of malnutrition on the academic performance of school children in Ethiopia: A systematic review and meta-analysis. SAGE Open Med. 2022 Sep 20;10:20503121221122398. doi: 10.1177/20503121221122398. PMID: 36161209; PMCID: PMC9500247.
2. Prof. Donald Bundy, et al, Disease Control Priorities, Third Edition: Volume 8. Child and Adolescent Health and Development

SIGNIFICANCE OF SCHOOL FEEDING

School feeding programmes aim to do more than bring children to school. The nutritional appropriateness of school meals holds great significance in terms of contributing to national development. Some of the benefits of school feeding are as follows:

Better learning and performance

Good nutrition and healthy meals allow children to learn and perform better and have chances to thrive and fulfill their potential as adults.

Delays early marriages

School feeding plays a role in school retention of children especially girls and promotes girls' education, empowering them to dissuade parents from early marriage.

Minimises impact of climate change

School feeding programmes play a key role in building resilience to food insecurity situations driven by climate change. It contributes to minimizing the impacts of climate change through environmentally sensitive food systems.

Act as an incentive

School feeding programmes act as an incentive for families to enroll and keep children in school.

Builds human capital

By benefitting children and families, it helps to build human capital which is the foundation for growth and economic development of any country. Further investing in the human capital development of children is among the most effective and productive investments that countries can make.[3]

High returns on investment

Cost-benefit analysis studies also show that school feeding programmes yield returns on education, health and nutrition, social protection, and local agriculture. The return on investment can be as high as US$9 for every US$1 invested in implementing school feeding programmes.[4]

Protects nutritional and educational rights

The school feeding programmes protect the nutritional as well as the educational rights of the children and aligns with Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), SDG 4 (Quality Education) and SDG 5 (Gender Equality) and contributes indirectly to SDG1 (No poverty), SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities).[5]

3. https://www.wfp.org/school-meals
4. State of School Feeding Worldwide 2020, WFP Publication
5. How School Meals Contribute to the Sustainable Development Goals- A Collection of Evidence, WFP publication, Feb'2017

In India, 33 percent of the population is under 18 years old, and of this, 20 percent is constituted by school-age children who represent the country's future workforce. Malnutrition either due to dietary deficiency or infections during this period can significantly impact the nation's economic development. The National Family Health Survey (NFHS) data from 2005-06 to 2019-2021 (NFHS-3 to NFHS-5) which provides prevalence estimates of malnutrition among children under five years, shows a gradual decline in rates of stunting and underweight on one side and an increase in the prevalence of overweight among children up to five years. However, the largest health survey in India does not reflect the nutritional status of school-going children.

Another one-time nationwide survey led by the Ministry of Health and Family Welfare, the CNNS (2016-2018)[6], reflects on the malnutrition situation of young children and adolescents. As per the report, on an average, 1 in 3 children suffer from chronic undernutrition (22% of children are stunted in the age group 5-9 years, and almost 1 in 5 children suffer from acute malnutrition or wasting (23.1% of children 5-9 years had low BMI for age while 24.1% of children aged 10-19 years had low BMI for age). Conversely, 3.7% and 4.8% in the same age groups are overweight. There are over 17 million children aged 5 to 19 years in India who are affected by obesity. If childhood obesity remains unchecked, these numbers will increase to 27 million by 2030. There are no gender differentials in the prevalence of overweight and obesity among children under five years and adolescents. The prevalence of childhood overweight and obesity is consistently higher in urban areas than in rural India across all three age groups. But the pace of increase is higher in rural areas.[7]

Similar to other lower-middle-income countries (LMICs) in India, the prevalence of childhood obesity currently increases gradually with improving economic status. However, in the urban sub-set of adolescents, the pace of obesity increase is highest in the lowest wealth quartile.

These numbers suggest that malnutrition is a major problem that affects children beyond the 1,000-day window; thus, dedicated efforts must be taken to prevent it.

The CNNS report also highlighted significant micronutrient deficiencies in school-age children. As per the survey, 23.5% of children aged five to nine years and 28.4% of children aged 10-19 years were anaemic, while 18.2 % and 23.9% showed Vitamin D deficiency (Figure 1). Moreover, 11.5% of 5-9-year-olds and 11% of 10-19-year-olds are pre-diabetic or diabetic, 4.9% of adolescents are hypertensive, and 16% of adolescents have high serum triglycerides, highlighting the emergence of diet-related non-communicable diseases among school-age children. The coexistence of undernutrition and rising overweight and non-communicable diseases in Indian children is a significant concern. These can be attributed to poor nutrition and the changing lifestyle with low physical activity. Various studies have linked diet and poor physical activity among children and adolescents to overweight and cardiovascular risk factors[8,9].

6. CNNS. (2018). Comprehensive National Nutrition Survey. Poshan Abhiyan. Ministry of Health and Family Welfare, Government of India.

7. Overweight and Obesity in Children and Adolescents (0-19 years) in India. Landscape Study, 2020

8. Lahiri A, Chakraborty A, Dasgupta U, Roy AKS, Bhattacharyya K. Effect of dietary habit and physical activity on overnutrition of school going adolescents: A longitudinal assessment in a rural block of West Bengal. Indian J Public Health. 2019 Jul-Sep;63(3):171-177. doi: 10.4103/ijph.IJPH_159_19. PMID: 31552844.

8,9. Day RS, Fulton JE, Dai S, Mihalopoulos NL, Barradas DT. Nutrient intake, physical activity, and CVD risk factors in children: Project HeartBeat! Am J Prev Med. 2009 Jul;37(1 Suppl):S25-33. doi: 10.1016/j.amepre.2009.04.006. PMID: 19524152; PMCID: PMC2729283.

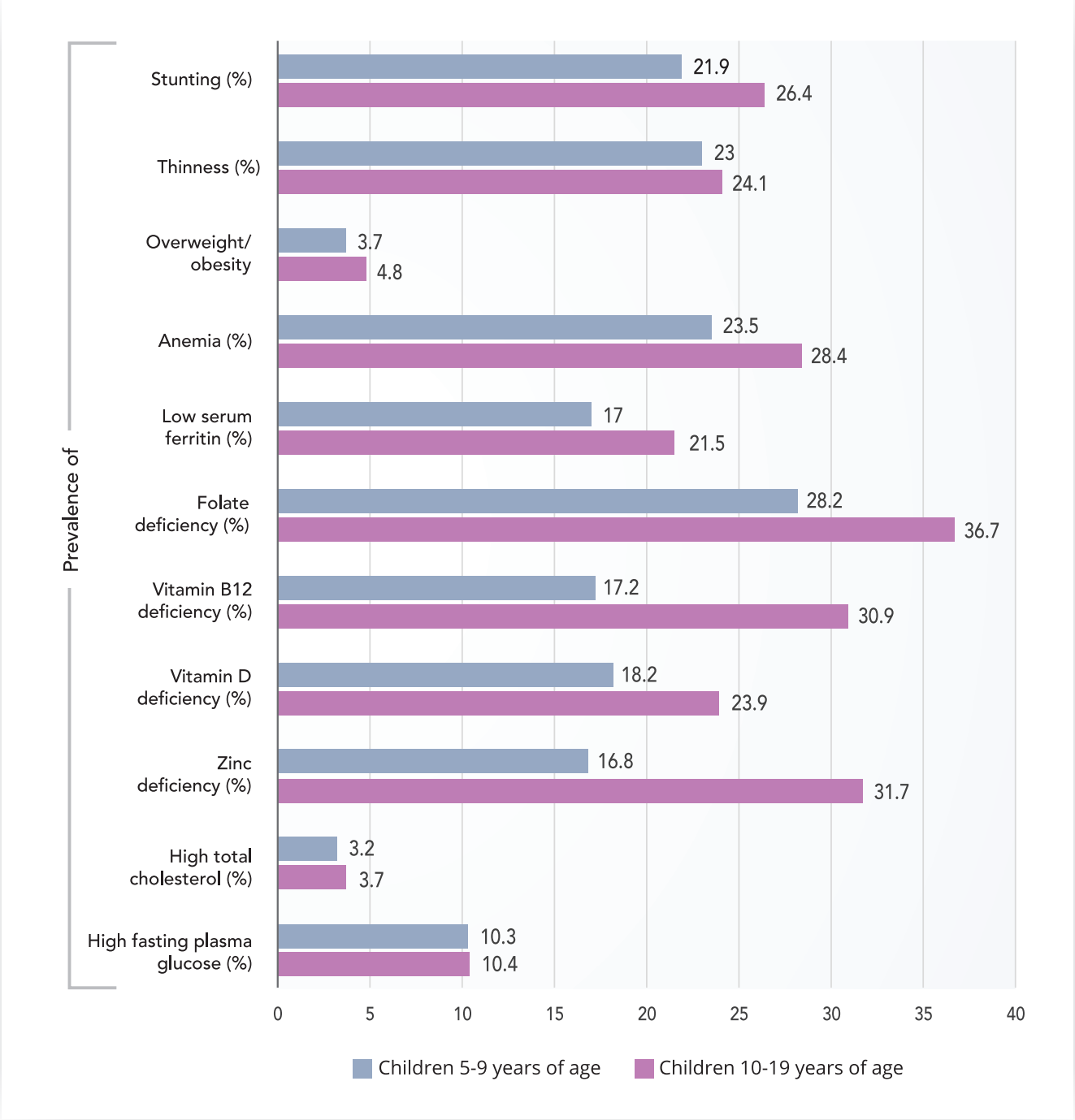


Figure 1: Nutritional status of school-age children (CNNS, 2018)

An analysis of diets of children and adolescents in the CNNS showed that they were low in pulses, fruits, and vegetables with only one in four or five children consuming these daily. Daily consumption of eggs and meats was less than 5% and overall, only 10% to 13% had foods from at least five food groups daily. About 77% of children reported consuming fast food at least on a weekly basis and a similar proportion did not meet daily recommended physical activity requirements.

In India, fast-food retail outlets and per-capita sales of vegetable oil, sugar, and confectionery has witnessed very rapid growth. Sales of confectionery has increased almost 10 times faster than pulses in the last five years.

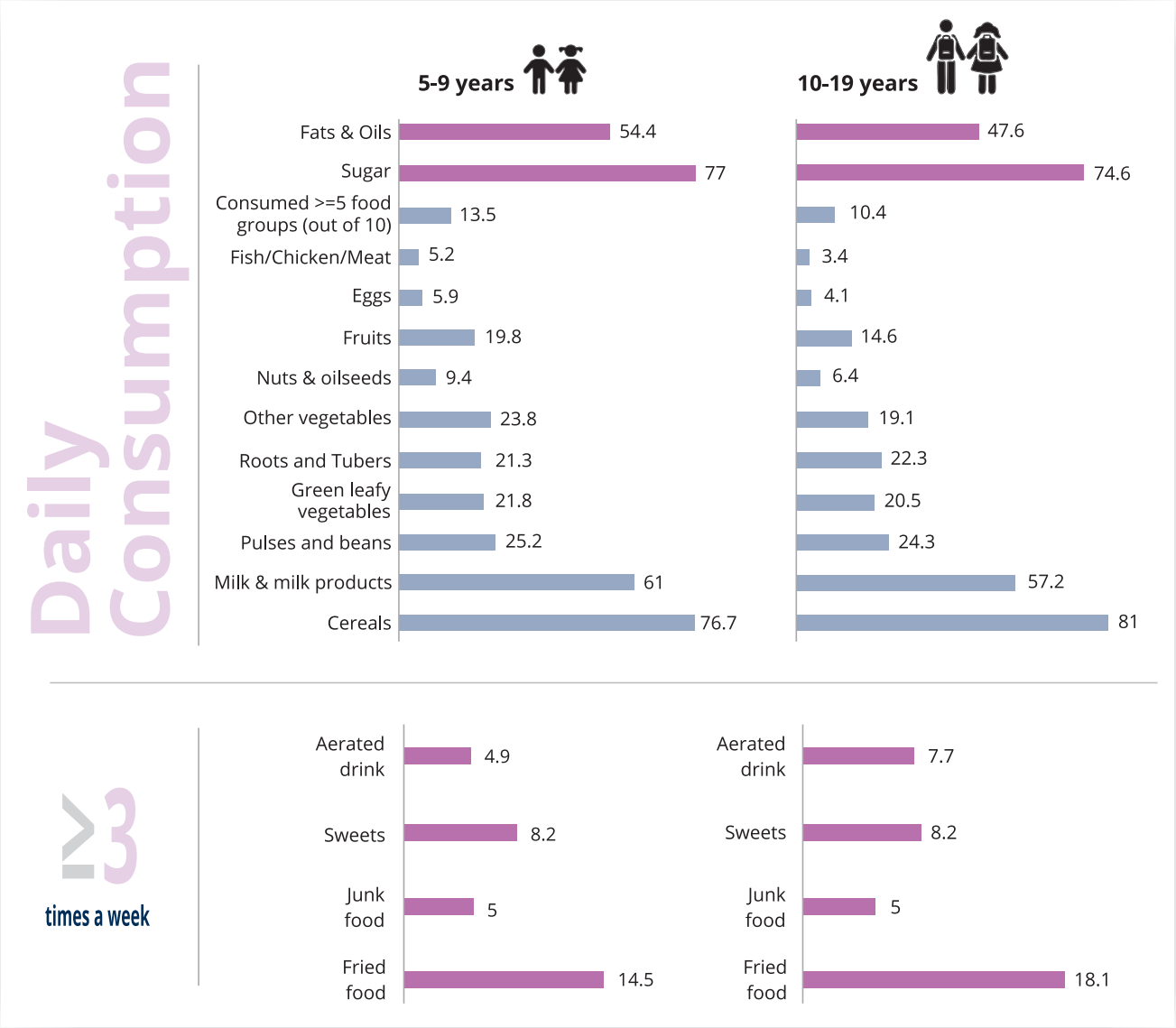


Figure 2: Dietary intake of children (5-9 years) and adolescents (10-19 years) who were affected by overweight or obesity (in percent)

Considering the state of malnutrition, school-based nutrition or feeding programmes provide an opportunity to significantly contribute towards improving the health and nutrition situation for this age group. Econometric studies[10] have demonstrated a substantial and multifaceted impact of India's school feeding scheme. The study indicated that the meals provided in schools have a dramatic positive effect on learning achievement wherein children with up to five years of primary school exposure along with school meals improved their test scores by approximately 10-20%, which is largely accounted for by nutrition-learning effects as one of the major factors. The study also found that the cost of providing a hot cooked meal to a child per year was only 10 USD; for five years it was 50 USD. It is one of the least expensive programmes in the world that greatly impacts the learning potential. Remarkably, the positive effects may extend to the children of mothers who were beneficiaries of the programme[11], thus fostering intergenerational improvements.

[10] Chakraborty, T. & Jayaraman, R. School feeding and learning achievement: evidence from India's Midday Meal Programme. IZA Discussion Paper 10086 (2016).

[11] Singh, A., Park, A. & Dercon, S. School Meals as a Safety Net: An evaluation of the Midday Meal Scheme in India. Econ. Dev. Cult. Change 62, 275–306 (2014).

PM POSHAN SCHEME

To tackle the multifaceted issues of hunger and education simultaneously, the Government of India has devised a comprehensive school meal programme known as the PM POSHAN scheme, erstwhile Mid Day Meal Scheme. This programme is India's second-largest food security initiative and follows a right-based approach to eliminating food insecurity. It is also the most extensive school meal programme globally, assisting 118 million students across India.

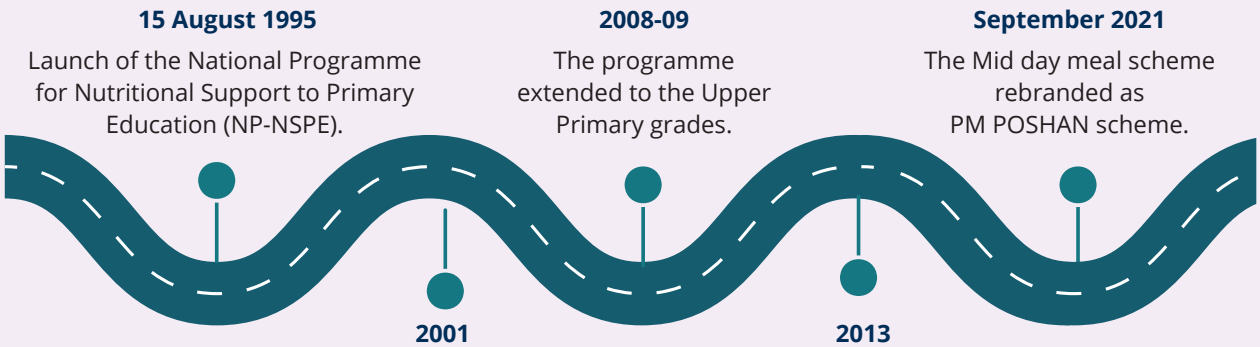
The scheme's objectives are twofold- to enhance the nutritional status of children from pre-primary to Grade VIII in government and government-aided schools, and encourage regular attendance and concentration in classroom activities. It also aims to provide nutritional support to children in drought-affected areas during summer vacations and disasters. Further, through the provision of meals, the PM POSHAN scheme complements health and hygiene services like the distribution of Iron Folic Acid (IFA) and deworming tablets, promotion of hand washing, etc. at school to ensure children's overall health.

The PM POSHAN scheme is a centrally sponsored scheme being implemented as per the principles of 'cooperative federalism' wherein the Central Government provides the policy architecture and guidelines, while States and UTs design detailed implementation structures. The cost for implementation is shared between the Central and State Governments.

The scheme is implemented through the designing and execution of a well-structured daily menu. This has been one of the critical features enforced by the government to ensure quality and effectiveness in implementing the scheme. The menu is thoughtfully designed at the state level in consultation with experts and is aligned with the food norms, local food preferences, and the utilization of locally available food items.

Evolution of the School Feeding Programme in India

Initially, the scheme was launched as the "National Programme for Nutritional Support to Primary Education (NP-NSPE)" on August 15, 1995, to universalize primary education, increase enrolment, retention, and attendance, and improve students' nutritional levels. Subsequently, it has evolved and strengthened in response to escalating malnutrition rates and poor learning outcomes. In 2001, a Supreme Court order mandated specific nutritional requirements to be met through the provision of hot-cooked meals in schools, and in 2008-09, the programme was extended to Upper Primary grades. The NFSA 2013 further bolstered the programme, mandating legal adherence to the nutrition norms. In September 2021, the scheme was revitalized and rebranded as the Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Scheme.



15 August 1995
Launch of the National Programme for Nutritional Support to Primary Education (NP-NSPE).

2001
Provision of hot cooked meals mandated to meet the specific nutritional requirements of school going children through a Supreme Court Order.

2008-09
The programme extended to the Upper Primary grades.

2013
The MDM scheme becomes a part of the NFSA.

September 2021
The Mid day meal scheme rebranded as PM POSHAN scheme.

PM POSHAN MENU MAPPING

Rationale and Methodology

The PM POSHAN scheme[12] benefits approximately 118 million children in 1.12 million schools nationwide, by providing hot cooked meals on all school days. These meals are provided to children in pre-primary sections and Primary and Upper Primary grades (I to VIII) across government, government-aided schools, and special training centres (STCs).

RATIONALE OF THE STUDY

The WFP undertook a comprehensive study to map the menus offered across the nation under the PM POSHAN scheme and assess them through a rigorous nutritional lens. The overarching objective of this study is to provide an unbiased assessment of the nutritional and dietary standards and norms within PM POSHAN and its implementation at the state level. The document also attempts to record the diverse practices employed by various States and UTs in meal planning, preparation, and distribution and, to offer well-informed recommendations for enhancing menu diversity and nutritional value.

[12] PM POSHAN Website: https://pmposhan.education.gov.in/

The study was conducted in line with the following objectives:

- To compare the PM POSHAN nutritional and food norms with school-age children's nutritional and dietary requirements.
- To map the hot cooked meal menus served in the States and UTs under the PM POSHAN scheme.
- To review and compare the menus and the scheme implementation by States and UTs vis-à-vis the GoI norms.
- To explore and assess innovative and best practices related to PM POSHAN.
- To identify areas for enhancing meal quality and provide recommendations for enhancing the quality of school meals considering both undernutrition and overnutrition.

METHODOLOGY

The landscape study was primarily planned to understand the implementation of the menus across States and UTs from a nutrition lens. A detailed framework was developed to ensure robustness in the data collection and analysis. The details of the same are presented below:

Coverage: 36 States and UTs

Tools: Open-ended questionnaire and telephonic interviews

Data Collection

- A pre-defined data collection tool was developed for this study. The tool captured detailed information about relevant aspects of PM POSHAN viz. food and nutritional norms, menu, provision of additional food items, basic information on scheme implementation, and any relevant State level initiatives to improve implementation.
- The tool was sent to the nodal officers responsible for the PM POSHAN scheme in their respective States and UTs. Repeated follow-ups were conducted with the nodal officers to obtain the desired information. In case of missing information or to get more clarity on the information provided, intensive interactions were held with States/UTs through different communication channels.
- An online search of the State governments' PM POSHAN website was conducted to gather information about State-specific policy recommendations on PM POSHAN. PM POSHAN's national website was also searched to get the required information on policy, guidelines, and other relevant directives related to it.
- Desk research was also conducted to identify relevant articles, reports, and best practices on PM POSHAN/MDM scheme, etc.

Data Analysis

The analysis of the state-wise data of the PM POSHAN menu was conducted as follows:

(i) Analysis of the PM POSHAN nutrition norms

a. Comparing nutritional norms prescribed under NFSA 2023 and PM POSHAN scheme against the RDA and estimated average energy intakes.

b. Assessing the contribution of micro-nutrients from fortified rice to meet the new NFSA standards.

(ii) Analysis of the PM POSHAN Food Norms

a. Comparing PM POSHAN food norms with suggested food groups to meet EAR of different nutrients.

b. Macronutrient composition and their contribution to calorie estimates of PM POSHAN meals.

(iii) Analysis of Menu: Provisions and implementation of PM POSHAN meals across different Indian States and UTs

a. Comparing the menu planning process

b. Frequency of repetition and updating menu

c. Choice of cereals

(iv) Analysis of variation in the implementation of food and nutrition norms of PM POSHAN scheme at State level

a. Variations in the nutritional norms

b. Variation in meal norms-Inclusion of breakfast

c. Variation in Food Norms-Inclusion of additional foods

(v) Cost of additional foods

Additionally, the innovations/best practices around the component of PM POSHAN from the States and UTs were identified and documented, wherever applicable.

Limitations of the study

- Repeated follow-ups were needed with States/UTs to obtain the required information.
- There were several instances of incomplete information leading to difficulties in drawing quantifiable comparisons.

Despite these challenges and limitations, requisite information was received through repeated follow-ups and alternate methods of validation which included telephonic interviews with the nodal officers and studying the State's annual progress reports on PM POSHAN and minutes of Project Approval Board meetings.

INSIGHTS FROM THE STUDY

Analysis of the PM POSHAN Scheme Norms

This section will compare the nutritional and food norms of PM POSHAN scheme with the recommendations on different nutrients by the National Institute of Nutrition (NIN) to promote good health and well-being in children. For better alignment with NIN's recommendations and to draw meaningful comparisons, the analysis considers children aged 4-9 years as Primary, and 10-15 years as Upper Primary. The NIN recommendations are clubbed for the age range of 4-6 years, 7-9 years, 10-12 years, and 13-15 years. The National Education Policy 2020 describes Pre-primary and Primary as separate grades covering the age group 4-9 years, but the nutrition norms applicable to both categories remain the same.

I. Comparing nutritional norms prescribed under NFSA 2023 and PM POSHAN scheme against the RDA

The PM POSHAN scheme provides specific nutritional and food norms for Primary (Grades 1-5) and Upper Primary school (Grades 6-8) children to receive the required energy and protein through hot cooked meals every school day. These norms were based on the Schedule II of the NFSA, 2013. However, in 2023, these norms were revised through a gazette notification issued on NFSA (Schedule II [sections 4(a), 5(1) and 6] Nutritional Standards).

The revision was brought forth considering the updates in the RDA in 2020. The revision of nutritional standards under NFSA 2023 for nutrition supplements supplied under food-based safety net schemes including PM POSHAN, has augmented the proportion of protein, laid down fat, carbohydrate, and cereal-pulse ratio norms and also mandated the inclusion of micronutrients. The new NFSA norms 2023 are still not under implementation. Table 1 presents a comparison of NFSA 2023, PM POSHAN, and RDA/EAR for macronutrients.

TABLE 1: COMPARISON OF NFSA 2023, PM POSHAN, ADJUSTED RDA FOR MACRONUTRIENTS

Age/ Gender [1]	Macronutrients [2]	RDA/ EAR [3]	Adjusted RDA/EAR* [4]	NFSA 2013 PM POSHAN norms [5]	Difference [5-4]	NFSA 2023
4-6 years	Energy (kcal) Protein (g/d)	1360 16/12.8	453.3 5.3/4.3	450 12	-3.3 6.7/7.7	450 15-20g (0.8-1)**
7-9 years	Energy (kcal) Protein (g/d)	1700 23/19	566.6 7.6/6.3	450 12	-116.6 4.4/5.7	450 15-20g (0.8-1)**
10-12 years$ boys	Energy (kcal) Protein (g/d)	2220 32/26.1	740 10.6/8.7	700 20	-40 9.4/11.3	700 22-25 g (0.8-1)**
10-12 years$ girls	Energy (kcal) Protein (g/d)	2060 33/26.6	686.6 11/8.8	700 20	13.4 9/11.2	700 22-25 g (0.8-1)**
13-15 years boys	Energy (kcal) Protein (g/d)	2860 45/36.3	953.3 15/12	700 20	-253 5/8	700 22-25 g (0.8-1)**
13-15 years girls	Energy (kcal) Protein (g/d)	2400 43/34.7	800 14.3/11.5	700 20	-100 5.7/8.5	700 22-25g (0.8-1)**

**Adjusted RDA=RDA/3; **Digestible indispensable amino acid score; $values considered for Upper Primary for NFSA norms*

To allow for a meaningful comparison of the nutritional and food standards within the PM POSHAN scheme, it is assumed that the RDA/EAR (Energy) of nutrients for the day is met through three meals. Therefore, the requirements (EAR/RDA) of all nutrients are divided into three and considered per meal. The term 'Adjusted RDA' in Table 1 represents the requirement for energy and protein per meal. Further, RDA references have been used for all macro and micronutrients for the purpose of analysis except for energy. For energy, EAR references have been used.

Evidently, the norms for protein laid out in the PM POSHAN scheme as well as the revised nutrition standards of Schedule 2 are higher than the adjusted RDA for protein per meal for both Primary and Upper Primary students. The present protein norms provide an additional 5.50 gm protein against an RDA of 6.50 gm per meal for Primary and 7.3 gm protein against an RDA of 12.7 gm per meal for Upper Primary. When compared to the newly suggested protein norms by NFSA 2023, which are 15-20 gm (average 17.5 gm) for Primary and 22-25 gm (average 23.5 gm) for Upper Primary, the proposed norms, on average, would provide 11g additional protein per meal for RDA for the Primary children and 11.13 gm for the Upper Primary children.

The calories provided through the programme are slightly deficit by 60 Kcal and 95 Kcal for Primary and Upper Primary, respectively. Considering the revised standards did not change for the calories, the deficit observed would remain the same for both sets of norms.

The new NFSA standards (2023) also laid down standards for seven micronutrients namely Calcium, Zinc, Iron, Dietary folate, Vitamin A, Vitamin B6, and Vitamin B12. A comparison of the adjusted RDA/EAR for these seven micronutrients indicates that on average the new standards for Primary children are sufficient to meet 90% of the adjusted RDA for Dietary Folate, Vitamin B6, and Vitamin B12, while it can sufficiently meet around 80% of the requirements for Calcium and Iron. Vitamin A is the only micronutrient for which the standards are almost 50% lower than expected to be provided in a meal for Primary children. Further, in the case of the Upper Primary children, on average, the new standards for Primary children are sufficient to meet almost 90% of the adjusted RDA for Zinc, Dietary Folate, Vitamin B6, and Vitamin B12, 85% requirement of Calcium while for Iron and Vitamin A, the new standards are 40-50% lower than the adjusted RDA for upper primary children. Refer to Table 2 for details.

TABLE 2: STANDARDS AND RDA FOR MICRONUTRIENTS, 2023

Age/ Gender [1]	Micronutrient [2]	RDA/EAR [3]	Adjusted RDA/ EAR* [4]	NFSA 2023 [5]	Difference [5-4]
4-6 years	Calcium (mg/day)	550/450	183.3/150	170	-13.3/20
	Zinc (mg/day)	4.5/3.7	1.5/1.2	2	0.5/0.8
	Iron (mg/day)	11/8	3.6/2.6	3.5	-0.1/0.9
	Dietary folate	135/111	45/37	50	5/13
	Vit. A (µg/day)	510/240	170/80	100	-70/20
	Vit. B6 (mg/day)	1.2/1.0	0.4/.33	0.43	.03/0.1
	Vit. B12(µg/day)	2.2/2.0	0.73/0.66	0.66	-0.07/0
7-9 years	Calcium (mg/day)	650/500	216.6/167	170	-46.6/3
	Zinc (mg/day)	5.9/4.9	1.96/1.63	2	0.04/0.37
	Iron (mg/day)	15/10	5/3.3	3.5	-1.5/0.2
	Dietary folate	170/142	56.6/47.3	50	-6.6/2.7
	Vit A (µg/day)	630/290	210/97	100	-110/3
	Vit B6 (mg/day)	1.5/1.3	0.5/0.43	0.43	-0.07/0
	Vit B12 (µg/day)	2.2/2.0	0.73/0.66	0.66	-0.07/0

Age/ Gender [1]	Micronutrient [2]	RDA/EAR [3]	Adjusted RDA/ EAR* [4]	NFSA 2023 [5]	Difference [5-4]
10-12 years boys*	Calcium (mg/day)	850/650	283.3/217	170/270	-13.3/53
	Zinc (mg/day)	8.5/7.0	2.83/2.3	2/4	1.17/1.7
	Iron (mg/day)	16/12	5.3/4	3.5/5.5	0.2/1.5
	Dietary folate	220/180	73.3/60	50/75	1.7/15
	Vit A (µg/day)	770/360	256.6/120	100/145	-111.6/25
	Vit B6 (mg/day)	2.0/1.7	0.6/0.56	0.43/0.66	0.06/0.1
	Vit B12 (µg/day)	2.2/2.0	0.73/0.66	0.66/0.66	-0.07/0
10-12 years girls*	Calcium (mg/day)	850/650	283.3/217	170/270	-13.3/53
	Zinc (mg/day)	8.5/7.1	2.83/2.4	2/4	1.17/1.6
	Iron (mg/day)	28/16	9.3/5.3	3.5/5.5	-3.8/0.2
	Dietary folate	225/186	75/62	50/75	0/13
	Vit. A (µg/day)	790/370	263.3/123	100/145	-118.3/22
	Vit. B6 (mg/day)	1.9/1.6	0.63/0.53	0.43/0.66	0.03/0.13
	Vit. B12 (µg/day)	2.2/2.0	0.73/0.66	0.66/0.66	-0.07/0
13-15 years boy	Calcium (mg/day)	1000/800	333.3/267	270	-63.3/3
	Zinc (mg/day)	14.3/11.9	4.76/4	4	-0.76/0
	Iron (mg/day)	22/15	7.3/5	5.5	-1.8/0.5
	Dietary folate	285/238	95/79.3	75	-20/-4.3
	Vit A (µg/day)	930/430	310/143	145	-165/2
	Vit B6 (mg/day)	2.6/2.2	0.86/0.73	0.66	-0.2/-0.07
	Vit B12 (µg/day)	2.2/2.0	0.73/0.66	0.66	-0.07/0
13-15 years girls	Calcium (mg/day)	1000/800	333.3/267	270	-63.3/3
	Zinc (mg/day)	12.8/10.7	4.26/3.6	4	-0.26/0.4
	Iron (mg/day)	30/17	10/5.6	5.5	-4.5/-0.1
	Dietary folate	245/204	81.6/68	75	-6.6/7
	Vit A (µg/day)	890/420	296.6/140	145	-151.6/5
	Vit B6 (mg/day)	2.2/1.8	0.73/0.6	0.66	-0.07/0.06
	Vit B12 (µg/day)	2.2/2.0	0.73/0.66	0.66	-0.07/0

**NFSA norms 2023 for Upper Primary children used for computing the difference*

II. Contribution of micronutrients from fortified rice to meet the new NFSA standards

GoI is supplying rice fortified with Iron, Vitamin B12, and Folic acid through its food-based social protection schemes, including PM POSHAN, where school-going children studying in grades 1 to 8 (6-14 years) are entitled to receive fortified rice. The rationing of fortified rice is fixed at 100 gm per child per day for Primary children and 150 gm per day per child for Upper Primary. Assuming that the children are receiving fortified rice daily, it is observed that fortified rice in the prescribed quantity can meet almost 100% requirement for Iron by the new standards and can contribute to 34% of the requirement for Dietary folate and 15%-22% of the requirement of Vitamin B12 for both primary and Upper Primary school children. Refer to Table 3 for details.

TABLE 3: MICRONUTRIENT CONTRIBUTION OF FORTIFIED RICE TO PM POSHAN MEALS

Micro-nutrients [1]	NFSA (2023) norms for Primary children [2]	Provision through fortified rice for Primary children [3]	Difference [3-2]	NFSA (2023) Norms for Upper Primary children [5]	Provision through fortified rice for Upper Primary children [6]	Difference [6-5]
Iron	3.5 mg	2.8 – 4.25 mg Av. 3.52 (ferric phosphate) 1.4 -2.12 mg (NaFeEDTA)	0.02 mg	5.5mg	4.2 – 6.37 mg Av. 5.28 mg 2.1 – 3.18 mg (NaFeEDTA)	-0.22 mg
Folate	50 µg	Folic Acid- 7.5 -12.5 µg *Dietary Folate Equivalent: 12.75 -21.25µg Av.10 µg/ 17ug*	-33 µg	75 µg	Folic Acid- 11.25 – 18.75 µg *Dietary Folate Equivalent– 19.12 -31.87µg Av. 15 µg/25.5 µg*	-49.5 µg
Vitamin B12	0.66 µg	0.075 – 0.125 µg Av. 0.1 µg	-0.56 µg	0.66 µg	0.112- 0.187 µg Av. 0.15 µg	-0.51 µg

**DFE – Dietary Folate Equivalent is calculated by multiplying folic acid by 1.7 to get the equivalent value as folate. The iron contributed by fortified rice is presented as range as the standards for fortified rice prescribed by Food Safety and Standards Authority of India (FSSAI) are expressed in range and thus a value of iron within that range is accepted by the Government for rice fortification. Also, the standard prescribes the use of either of the 2 compounds – Ferric Pyrophosphate and Sodium Iron Ethylene Diamine (NaFeEDTA) for rice fortification, thus both values are presented for ease of comparison.*

III. Comparing PM POSHAN food norms with suggested food groups to meet EAR of different nutrients

The PM POSHAN guidelines prescribe a set of food norms for preparing meals at the school level. These norms suggest appropriate quantities of cereals, pulses, vegetables, fats, and oils to meet the recommended nutritional requirements as indicated by NFSA 2013.

However, with the new nutritional norms of NFSA, 2023 and revisions in nutritional requirements, it is essential to assess the adequacy of these food norms. In the recently updated report on RDA and EAR of nutrients 2023, NIN has recommended various food groups for a balanced diet to meet the EAR of different nutrients. The suggested quantities of foods in each food group for children are tabulated below:

TABLE 4: FOOD NORMS UNDER PM POSHAN AND AS PER EAR, NIN 2023

Age/Gender [1]	Food groups [2]	Intake/day to meet EAR [3]	Adjusted intake* [4]	PM POSHAN food norms [5]	Difference [5-4]
4-6 years	Cereals/millets	160	53.3	100	46.7
	Pulses and beans	60	20	20	0
	GLV#	50	16.6	50	-16.5
	Vegetables	100	33.3		
	Roots and tubers	50	16.6		
	Fruits	75	25	NA	-25
	Nuts	15	5	NA	-5
	Milk	350	116.6	NA	-116.6
	Fats and oil	20	6.6	5	-1.6
7-9 years	Cereals/millets	200	66.6	100	33.4
	Pulses and beans	65	21.6	20	-1.6
	GLV	100	33.3	50	-66.6
	Vegetables	150	50		
	Roots and tubers	100	33.3		
	Fruits	100	33.3	NA	-33.3
	Nuts	20	6.6	NA	-6.6
	Milk	400	133.3	NA	-133.3
	Fats and oil	25	8.3	5	-3.3

#*Green Leafy Vegetables*

Age/Gender [1]	Food groups [2]	Intake/day to meet EAR [3]	Adjusted intake* [4]	PM POSHAN food norms [5]	Difference [5-4]
10-12 years boys*	Cereals/millets	290	96.6	100/150	3.4/53.4
	Pulses and beans	95	31.6	20/30	-11.6/-1.6
	GLV	100	33.3	50/75	-83.2/-58.2
	Vegetables	200	66.6		
	Roots and tubers	100	33.3		
	Fruits	100	33.3	NA	-33.3
	Nuts	30	10	NA	-10
	Milk	400	133.3	NA	-133.3
	Fats and oil	30	10	5/7.5	-5/-2.5
10-12 years girls*	Cereals/millets	250	83.3	100/150	16.7/66.7
	Pulses and beans	85	28.3	20/30	-8.3/1.7
	GLV	100	33.3	50/75	-83.2/-58.2
	Vegetables	200	66.6		
	Roots and tubers	100	33.3		
	Fruits	100	33.3	NA	-33.3
	Nuts	30	10	NA	-10
	Milk	400	133.3	NA	-133.3
	Fats and oil	30	10	5/7.5	-5/-2.5
13-15 years boys	Cereals/millets	390	130	150	20
	Pulses and beans	130	43.3	30	-13.3
	GLV	100	33.3	75	-58.2
	Vegetables	200	66.6		
	Roots and tubers	100	33.3		
	Fruits	100	33.3	NA	-33.3
	Nuts	40	13.3	NA	-13.3
	Milk	400	133.3	NA	-133.3
	Fats and oil	45	15	7.5	-7.5

Age/Gender [1]	Food groups [2]	Intake/day to meet EAR [3]	Adjusted intake* [4]	PM POSHAN food norms [5]	Difference [5-4]
13-15 years girls	Cereals/millets	315	105	150	45
	Pulses and beans	105	35	30	-5
	GLV	100	33.3	75	-58.2
	Vegetables	200	66.6		
	Roots and tubers	100	33.3		
	Fruits	100	33.3	NA	-33.3
	Nuts	35	11.6	NA	-11.6
	Milk	400	133.3	NA	-133.3
	Fats and oil	35	11.6	7.5	-4.1

**For ages 10-12 years, PM POSHAN food norms have been presented for both Primary and Upper Primary children as primary school is likely to cover children aged 6-10 years, while Upper Primary school is likely to have children above 10 years of age and hence there is an overlap in age category 10-12 years.*

The comparison reveals that the PM POSHAN norms are higher for cereals than the NIN suggested food norms by 40 gm to 49 gm for Primary and Upper Primary children respectively, while they fall short in providing enough vegetables, pulses, fats/oils, and vegetables. The higher proportion of cereals in the PM POSHAN norms contributes to energy as well as protein requirements as stipulated in the NFSA 2013 but does not necessarily lead to the use of the protein for body-building purposes as the protein is sub optimal. Further, the PM POSHAN norms recognise vegetables as a single category while the EAR differentiates vegetables as green leafy vegetables, vegetables, roots, and tubers. The current norms for vegetables fall short by 42 gm (46%) for Primary and 58 gm (43%) for Upper Primary children compared to the recommended amounts given by NIN for all categories of vegetables combined.

As for fats and oils, the PM POSHAN food norm for Primary and Upper Primary children is 2.5 gm to 3.83 gm less than the average EAR.

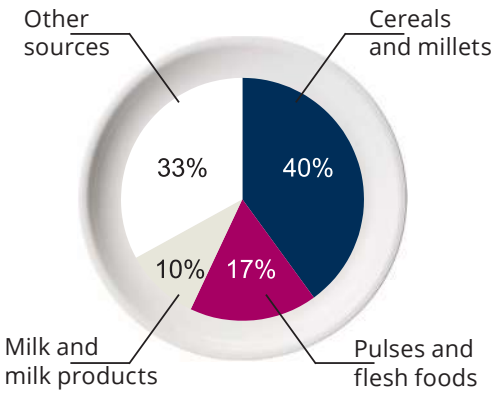
Additionally, the current food norms of PM POSHAN do not include fruits, though few States provide fruits albeit, occasionally.

What India Eats?[13]

The dietary data analysis of adults in urban and rural India on macronutrient intakes based on household 24-hour dietary recall showed that an average adult from urban India consumed 1,943 Kcal/day, 289 gm carbohydrates, 51.6 gm fat, and 55.4 gm protein. In rural regions, an average adult consumed 2,081 kcal/day, 368 gm of carbohydrates, 36 gm of fat, and 69 gm of protein. As per food groups, the total energy (E) intake from cereals contributed to 998 Kcal/day, while visible fats and pulses & legumes contributed to 265 Kcal/day and 119 Kcal/day respectively in urban areas. In contrast, the total energy intake from cereals was much higher (1,358) Kcal/day, and considerably lower from fats (145 Kcal/day), pulses, and legumes (144 Kcal/day) in rural areas. Whereas milk and milk products contributed almost similar in urban (99 Kcal/day) and rural areas (87 Kcal/day).

As per the recommendations on food groups, not more than 45% of energy should be contributed by cereals and millets, whereas the actual contribution was 51% in urban region and 65.2% in rural region; while pulses, legumes, meat, poultry, and fish contributed to mere 11% of the total energy per day in urban areas and rural areas, as against the recommended minimum intake level of 17% of total energy from these foods. As for milk and milk products, only 8.7% in rural and 14.3% of the population in urban areas consumed as per the recommended intakes. About 8.8% of the population in rural and 17% in urban areas consumed vegetables as per the recommended intake while 22% in rural and 27% in urban areas consumed the recommended intake of nuts and oil seeds. Importantly, other foods (chips, biscuits, chocolates, sweets, juices, etc.,) contributed to 11% Energy per day in urban areas as compared to 4% in rural areas. When compared with the 'My Plate' recommendations, the majority of the population consumed lower than recommended levels of pulses, legumes, milk, nuts, and vegetables while consumption of cereals and millets was higher than recommended levels.

My plate for the day typically recommends 40% of calorie/energy (E) intakes from cereals and millets, 17% E from pulses and flesh foods, and 10% E from milk and milk products for a 2000-calorie diet in a day.



While this "Landscape analysis of the PM POSHAN scheme" report primarily looks into the hot cooked meals served in government and government-aided schools in India; in terms of its findings of cereal dominance of diets, limited diversity, etc it resonates with other reports such as the *Comprehensive National Nutrition Survey* and *What India Eats?* where diets of school-age children and Indian adults have been looked upon in greater detail. The meals served in schools though cannot be designed to fulfil the dietary requirements of the day, but they do need to be as balanced and as nutritious as possible within the caloric and protein parameters defined.

[13] ICMR/NIN (2020) What India Eats. Dept. of Health Research. MoHFW

IV. Macronutrient composition and their contribution to calorie estimates of PM POSHAN Meals

The primary sources of energy in Indian diets are predominantly plant-based foods. The recent scientific update (2023)[14] recommends an Acceptable Macronutrient Distribution Range (AMDR)[15] for children in the age group of 3-18 years for carbohydrates (45%-65% of energy), protein (5%-15% of energy), and fat (25%-35% of energy); n-6 PUFA (4-10% of energy) and n-3 PUFA (0.5-1% of energy) and limiting saturated and trans fats. An analysis of the macronutrients composition of a standard hot cooked meal, as prescribed under PM POSHAN food norms for both primary and upper primary suggests that while the macronutrient composition of the meal is quite sufficient to meet the EAR for energy, the calorie distribution from the hot cooked meal is skewed, with Carbohydrates (CHO) contributing to more than 75% calories of the total energy in both the groups. This is higher than the AMDR for carbohydrates (45%-65% of energy). Further, the calories from protein are in line with the AMDR of (5%-15% of energy), with proteins contributing to nearly 12% calories and for fat, the percentage calorie contribution was observed to be around 12%, which is much lower than the NIN recommendation of a minimum of 25% calories from fat (Figure 2).

Carbohydrate: The primary source of carbohydrate in school meals is cereals, followed by pulses, roots, and tubers, and less from green leafy vegetables. WHO strongly recommends that carbohydrate intake should come primarily from whole grains, vegetables, fruits (250 – 400 gm/day), pulses, and naturally occurring dietary fibre as consumed in foods (15 – 21 gm per day) for all individuals of two years of age and older. CHO from whole grains, legumes, vegetables, and whole fruits is associated with a reduced risk of Type-2 Diabetes Mellitus (T2DM) and Cardiovascular Disease (CVD). The effects may mainly depend on specific components of CHO; on the one hand, simple sugar may increase the glycaemic load of the food; on the other hand, fibre and complex starch present in whole grains and whole fruits contribute to low glycaemic load, thus having a positive impact on health.

Protein Quality: Adequate dietary protein is essential during growth when new tissue proteins are synthesised. While the proteins can be derived from both animal and plant sources, the efficiency of dietary protein utilization depends upon the digestion and absorption of the released amino acids, which is often better for animal-source protein. Further, by their amino acid composition, animal source proteins are good quality proteins. The PM POSHAN guidelines recommend the use of pulses as the key source of protein. The total protein intake from various food sources in hot-cooked meals recommended PM POSHAN food norms falls within the range of 12 to 19 gm for Primary and Upper Primary students respectively, and pulses contribute approximately 5 to 7 gm of protein to both groups. However, it is important to note that a substantial portion of the protein is derived from cereals, which presents a practical challenge. Children may find it difficult to consume large quantities of cereals supplied to meet their protein needs, while at the same time, the quality of protein is poor as well. Therefore, providing children with more nutrient-dense protein sources is imperative to ensure they receive the necessary nutrients without excessive reliance on cereals.

There is another method to assess the quality of proteins, known as the Digestible Indispensable Amino Acid Score (DIAAS), which evaluates the amounts of amino acids absorbed and utilized by the body from a protein source (an accurate measure of protein's contribution to human amino acid and nitrogen requirements).

[14] Revised Short Summary Report – 2023, ICMR -NIN Expert Group on Nutrient Requirements for Indians, Recommended Dietary Allowances (RDA) and Estimated Average Requirements (EAR) -2020

[15] The AMDR is a range of macronutrient intakes that is associated with a reduced risk of chronic diseases but, at the same time, provides adequate intakes of essential nutrients. It is usually expressed as percentage of energy, with a lower and upper limit.

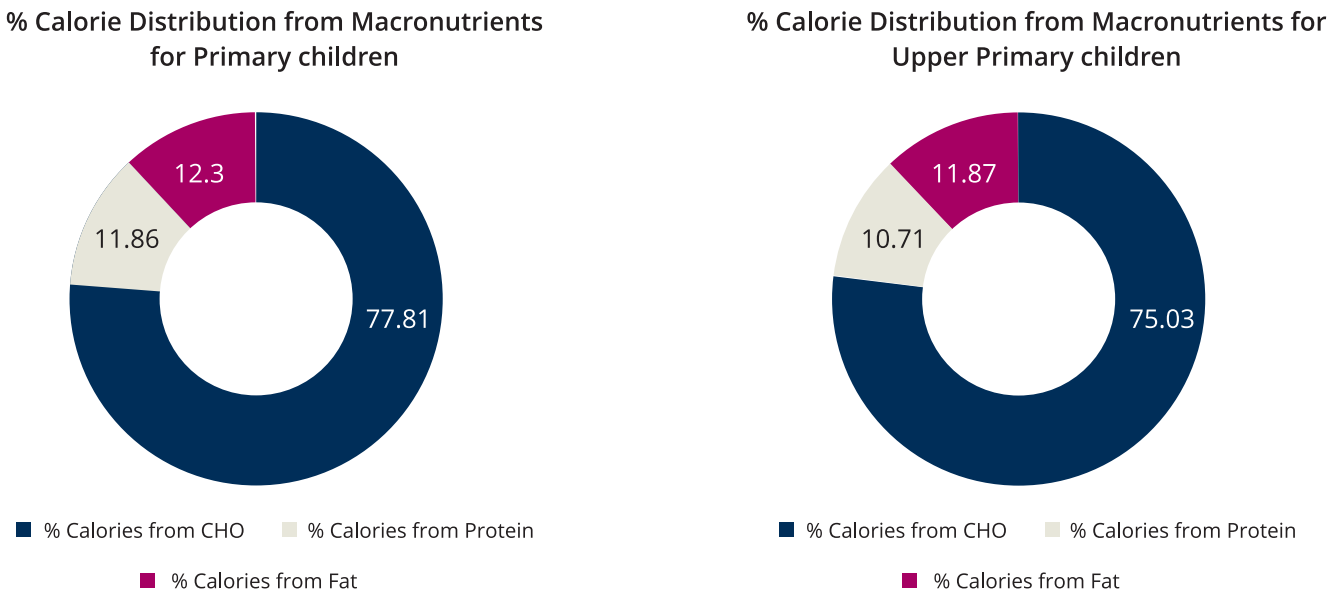


Figure 3: Percentage calorie distribution of macronutrients for PM POSHAN meals for Primary and Upper Primary children

The PM POSHAN meals utilize a combination of cereals and pulses to ensure that protein content from both cereals (limiting in lysine) and pulses (limiting in methionine) are optimally utilised. However, a typical PM POSHAN meal also has a lower DIAAS value, ranging around 60-70%. Additionally, some States also include vegetarian protein sources like soya chunks and ready-to-eat foods like peanut brittle (*chikki*), incorporating groundnuts into recipes to enhance protein content. However, to attain the amino acid requirements from plant protein, an individual will be required to consume twice the quantity compared to animal protein. A few States have gone ahead and introduced eggs (17 States & UTs) and milk (11 States & UTs) in meals, acknowledging the benefits of animal protein.

Digestible Indispensable Amino Acid Score (DIAAS)

DIAAS is one of the methods to assess protein quality. The DIAAS score is developed considering losses incurred among the protein sources. Differences in protein digestibility from different foods may arise due to differences in protein configuration, amino acid bonding, the presence of non-protein constituents, anti-nutritional factors (dietary fibre, tannins, and phytate), and processing conditions that alter the release of amino acids from proteins by enzymatic processes. As per Food and Agriculture Organization (FAO)[16], the DIAAS value of a food item is interpreted below:

DIAAS Value (%)	Interpretation
> 100	Excellent quality protein source
75 – 99	Good quality protein source
< 75	It cannot be claimed as a good-quality protein

A DIAAS score of 100 & more indicates that the protein source is high quality and can satisfy the body protein requirement of a particular age. A DIAAS score below 100 indicates that the protein source is limiting in at least one amino acid.

Generally, animal proteins (i.e., dairy, eggs, and meat) are considered "excellent" quality proteins. In contrast, plant proteins and cereal grains generally have DIAAS values that are less than 75, except for soy protein, which usually has a DIAAS value between 90 and 105.[17] and oats with a DIAAS value of around 75.[18] The egg is considered to have a DIAAS of 113%, whereas cereals and pulses combined have a DIAAS value of 60-70%.[19]

Dietary fat: Dietary fat plays a pivotal role in enhancing the overall sensory experience of food, including its texture, taste, and flavour. Dietary fats originate from two primary sources: invisible fats present naturally in both plant and animal foods and visible fats or added fats and oils used in culinary preparation. The primary source of fat in the mid day meal is the visible fat through seed oil used for cooking. The most used oils are mustard, soya bean, and rice bran oils. In Tamil Nadu, palm oil is the preferred choice for cooking POSHAN meals, even though coconut oil is commonly used in households. Notably, no specific guidelines have been issued regarding the selection of cooking oils apart from ensuring the correct quantity per child. Consequently, the choice of oils is typically based on local availability and affordability.

While it is advisable to diversify the consumption of vegetable oils to align with fat intake recommendations and achieve ideal levels of individual fatty acids in the Indian diet, very few States and UTs namely Chandigarh,

[16] Consultation, F. E. (2013). Dietary protein quality evaluation in human nutrition. FAO Food Nutr. Pap, 92, 1-66.

[17] Ertl P, Knaus W, Zollitsch W (November 2016). ." *Animal*. **10** (11): 1883–1889.

[18] Bailey, H. M., & Stein, H. H. (2019). Can the digestible indispensable amino acid score methodology decrease protein malnutrition? Animal Frontiers, 9(4), 18-23.

[19] Shivakumar, Nirupama & Kashyap, Sindhu & Kishore, Satvik & Thomas, Tinku & Varkey, Aneesia & D, Sarita & Preston, Thomas & Jahoor, Farook & Sreeman, Sheshshayee & Kurpad, Anura. (2019). Protein-quality evaluation of complementary foods in Indian children. The American Journal of Clinical Nutrition. 109. 1319-1327. 10.1093/ajcn/nqy265.

Chhattisgarh, Himachal Pradesh, Telangana, Goa, and Odisha have been observed to be using 2-3 variants of cooking oil. Further, preference for vegetable oils as the primary fat source in hot cooked meals and a lack of nuts, oilseeds, and animal fats like eggs, milk, and dairy products contribute to an imbalanced ratio of Omega-6 to Omega-3 fatty acids. It is imperative to re-evaluate the PM POSHAN food guidelines and norms to incorporate a more comprehensive array of sources for healthy dietary fats, along with precise specifications regarding the food items and their recommended quantities.

Summary of Findings

01. PM POSHAN meals provide slightly lower total calories compared to the recommended EAR for calorie intake.

02. The calorie distribution within POSHAN meals is skewed, with a higher proportion of calories from carbohydrates and a lower proportion from fats than what is recommended.

03. The protein content in these meals aligns with the recommended levels.

04. Cereals on account of their overwhelming presence are the main contributors for protein in the PM POSHAN scheme.

05. The protein content in these meals lacks essential amino acids, indicating poor quality protein.

06. These meals are deficient in dietary fat, with the fat calories mainly coming from visible fats. Also, there is lack of diversity in the type of cooking oil used.

07. Fortified rice at the prescribed quantity can meet 100% requirement for Iron in accordance with the new standards and can contribute to 34% of the requirement for Dietary folate and 15%-22% of the requirement of Vitamin B12 for both Primary and Upper Primary school children.

INSIGHTS FROM THE STUDY

Analysis of State level implementation of the PM POSHAN scheme

I. Analysis of Menu - Provisions and implementation of PM POSHAN meals across different Indian States and UTs

Menu planning: The menu for PM POSHAN meals is mostly planned at the level of the State, with 75% of States planning menus at the State level. There is flexibility at the district and school level to adjust the ingredients of recipes from within the food groups based on local preferences, availability of vegetables/oil/pulses in local markets, season, and cost. There are exceptions such as Chandigarh, Maharashtra, Andaman Nicobar, Himachal Pradesh, Jammu and Kashmir, Kerala, and Nagaland, where menu decisions are made at the district level, involving greater participation from blocks and schools. The menu planning is usually done in consultation with a nutrition consultant, experts, or technical agencies which take into consideration many parameters such as nutrient requirements, cost, diversity of menu, etc., while finalizing the menu, and the inclusion of local foods and food habits are prioritised.

Frequency of repetition and menu update: Almost all States (92% or 33 States) have weekly menus, while the States of Arunachal Pradesh, and Tamil Nadu repeat the menu every fortnight. Haryana stands out as a unique case as it diverges significantly from the norm by not adhering to a pre-set menu. Instead, they offer a list of 20 recipes from which schools can select

dishes for each day, but these selections are to be repeated every two weeks. Himachal Pradesh also deviates from the weekly menu pattern by implementing a district-wise menu plan, where each district follows a monthly menu. The menus decided at the State or Union Territory level are often fixed for extended periods, with no consistent pattern for menu revisions. The frequency of menu updates varies across regions, with 13 States revising their menus annually, Arunachal Pradesh and West Bengal making changes every six months, and Goa and Nagaland modify their menus every quarter.

Choice of cereals in the meals: The States primarily designed the menus to meet nutritional and food norms, wherein Primary and Upper Primary children are entitled to 100 and 150 gm of cereals respectively. However, the choice of cereals varies from only rice or, only wheat to a combination of rice and wheat. Data suggests that about 86% of States and UTs preferred fortified rice as the primary cereal. Across five States (Goa, Madhya Pradesh, Punjab, Rajasthan, and Uttar Pradesh), wheat flour is the primary cereal included in the hot cooked mid day meal along with rice for a few days every week. Madhya Pradesh, in particular, tailors its choice of primary cereal—either fortified rice or non-fortified wheat flour—based on regional preferences, with fortified rice being provided in rice-consuming areas and wheat in wheat-consuming regions of the State.

II. Analysis of variation in the implementation of food and nutrition norms of PM POSHAN scheme at the State level

Variation in the nutritional norms: For menu planning, the States follow the guidelines on nutritional norms on calories (450 Kcal for Primary and 700 Kcal for Upper Primary) and protein (12 gm and 20 gm for Primary and Upper Primary respectively) set by the GoI. A few States have introduced variations in nutritional norms to ensure school children's nutritional adequacy. The following States and UTs have revised nutritional norms for school feeding programmes (PM POSHAN) and provide additional calories and proteins beyond standard criteria, namely Andhra Pradesh, Dadra and Nagar Haveli and Daman and Diu, Gujarat, Odisha, and Tamil Nadu (Annexure 1).

Variation in meal norms - Provision of breakfast: The PM POSHAN scheme's guidelines envisage providing one hot cooked meal to school children in grades I-VIII in Government and Government aided schools. During the analysis, it was observed that seven States and UTs are taking special initiative to include additional meals especially breakfast in an attempt to provide wholesome nutrition to the children. The frequency of breakfast varies from three days per week in Andhra Pradesh and Telangana to six days per week in Gujarat and Tripura (Annexure 2). The food provided varies from eggs, seasonal fruits, and milk to traditional health drinks such as *Sukhdi* and, *Ragi Java*. The National Education Policy 2020, recognises the importance of breakfast for learnings and therefore envisages for provision of simple but energizing breakfast in addition to mid day meals in schools.

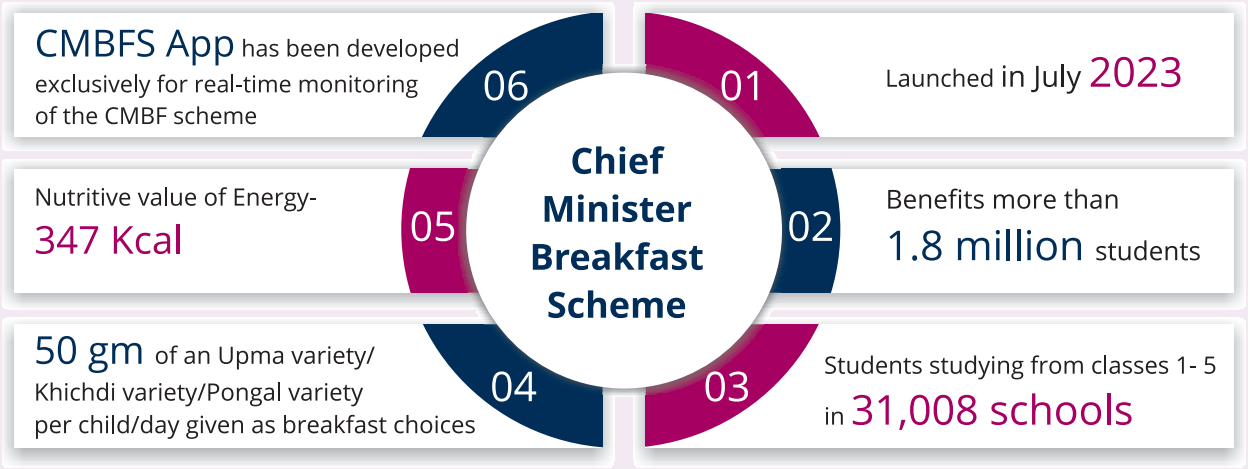
TAMIL NADU

Chief Minister's Breakfast Scheme (CMBFS)

(Use of additional meals to improve school attendance as well as leveraging technology for monitoring)

The State has introduced the Chief Minister's Breakfast Scheme (CMBFS) for Primary school children with objectives to increase school attendance, improve the nutritional status of the children, combat malnutrition at the same time, and empower women by providing employment opportunities. The scheme was launched in July 2023 and is expected to benefit more than 1.8 million students studying from grades 1- 5 in 31,008 schools. The State offers 50 gm of Upma/Khichdi/ Pongal per child/day as breakfast choices that contribute to a nutritive value of Energy - 347 Kcal, Protein - 9.08 gm, Fat - 11.19 gm, Iron - 10.77 mg, and Calcium - 36.76 mg.

In urban areas, the scheme is implemented through cluster/common kitchens, and in block/village panchayat and hill areas, the scheme is being implemented through respective Village Panchayats/SHGs. For ease and consistency in implementation, a detailed operational guideline has been developed. Further, a Nodal Officer has been nominated for every district to monitor the CMBFS programme, and SHG and Panchayat Level Functionaries (PLF) actively support the programme in rural areas. The initiative is well supported by the use of technology wherein a separate CMBFS mobile application has been developed exclusively for real-time monitoring of the CMBF scheme.



Variation in food norms- Inclusion of additional foods: States and UTs primarily have the mandate to ensure that the menus are designed in such a way that they meet the target nutritional and food norms, as stipulated in the PM POSHAN guidelines. The guidelines also offer the opportunity for the State to leverage its resources to provide additional food to the school children. It was observed that around 75% of the States and UTs (27) have introduced different foods in addition to the prescribed food norms set by GoI. However, there are variations in the type of additional food and coverage, with some States providing additional foods State-wide and others in specific districts or blocks. Additionally, the States of Andhra Pradesh, Gujarat, Kerela, and Odisha have also introduced some variations in the per-child PM POSHAN food norms, increasing the quantities of pulses, vegetables, and fats to make diets rich and nutritious.

TABLE 5: INCLUSION OF ADDITIONAL FOOD ITEMS IN THE PM POSHAN SCHEME IN STATES AND UTs

States/UTs providing milk	States/UTs providing egg*	States/UTs providing ready-to-eat	States/UTs providing millet foods	States/UTs providing fruits
Chhattisgarh	Andaman & Nicobar Islands	Andhra Pradesh	Bihar	Andaman & Nicobar Islands
Dadra and Nagar Haveli and Daman and Diu	Andhra Pradesh	Chhattisgarh	Goa	Bihar
Goa	Assam	Delhi	Tripura	Delhi
Gujarat	Bihar	Goa	West Bengal	Jharkhand
Haryana	Jammu & Kashmir	Gujarat		Kerala
Karnataka	Jharkhand	Karnataka		Tamil Nadu
Kerala	Karnataka			Uttar Pradesh
Puducherry	Kerala			Uttarakhand
Rajasthan	Meghalaya			
Uttar Pradesh	Mizoram			
Uttarakhand	Odisha			
	Puducherry			
	Sikkim			
	Tamil Nadu			
	Telangana			
	Uttarakhand			
	West Bengal			

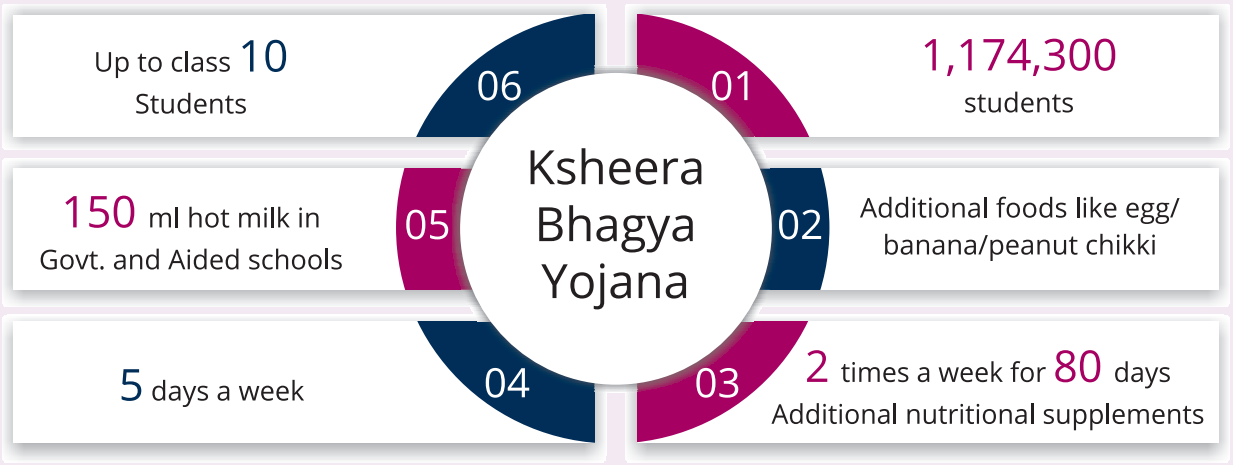
**Tripura and Lakshadweep also provided eggs through the PM POSHAN scheme but within the existing budget.*

Milk as an additional food: Milk is supplied by 31% (11) States. Among these 11 States and UTs, Chhattisgarh, Dadra and Nagar Haveli and Daman and Diu, and Goa provide milk exclusively in specific districts or Talukas. The type of milk offered varies from skimmed milk powder to fresh boiled milk/whole milk to flavoured milk to dairy whitener (Figure 4). Chhattisgarh was the only State providing flavoured soy milk to the children. Except in Uttar Pradesh, in all other States and UTs, sugar was added to the milk served to the children and it ranged between 3.28 gm - 18 gm per child per day. Three States and UTs (Puducherry, Dadra and Nagar Haveli and Daman and Diu, Goa) add a micronutrient

health mix to the milk provided, while two States provide a health drink (Gujarat and Chhattisgarh). The type of milk preparation offered has implications on overall health of children as many States add high quantity of sugar into these preparations and the composition of all milk substitutes is not alike (Annexure 3).

KARNATAKA

Ksheera Bhagya Yojana



The State of Karnataka is providing hot milk (150 ml) to children studying in Government and Government Aided schools for five days a week under the State's Ksheera Bhagya scheme. The milk is prepared by mixing 18 gm whole milk powder per child per day with water, and 10 gm of sugar is added. Recently the government has increased the coverage of the PM POSHAN programme to cover children up to the 10th grade reaching to additional 1,174,300 students. This scheme is fully funded by the State government. Additional foods like egg/banana/peanut chikki are also provided to children as additional nutritional supplements two times a week for 80 days for the academic year.

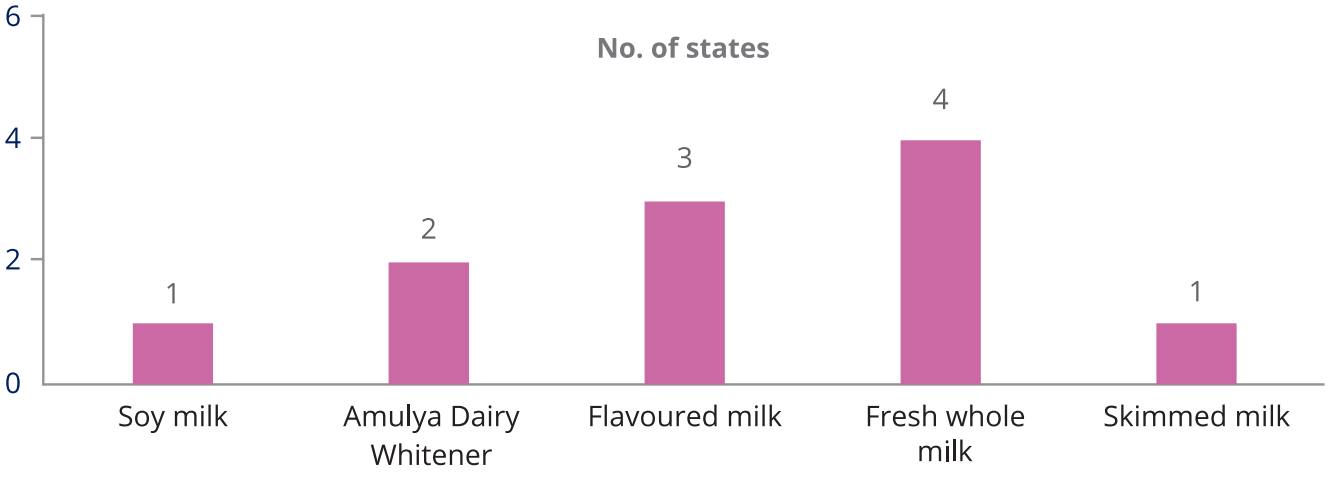


Figure 4: Types of milk being provided under the PM POSHAN scheme in States and UTs

Eggs as an additional food: Eggs, as an additional source of protein in school meals, are offered by a total of 17 States (16) and UTs (1). Among these, just three States and UTs viz. Andaman and Nicobar Islands, Andhra Pradesh, and Tamil Nadu—supply one egg to students on all school days. The Andaman and Nicobar Islands provide 5- 6 eggs in a week. While Andhra Pradesh and Tamil Nadu offer five eggs per week, Puducherry and Telangana follow closely by providing three eggs daily, whereas the remaining States offer only 1-2 eggs per week (Annexure 4). In Assam, eggs are exclusively provided to school children in tea garden areas.

Millet as an additional food: A few States have attempted to introduce diversity through millets. While States like Andhra Pradesh, Chhattisgarh, Haryana, and Telangana are providing millet-based foods across the States, there are another six States (Tripura, Bihar, West Bengal, Sikkim, Goa, and Karnataka) that provide millets in specific pockets. Millets are primarily offered in the form of ready-to-eat foods and recipes as part of the breakfast or the mid day meal menu (Annexure 5). Considering 2023 as the International Year of Millets, some States/UTs are treading towards the inclusion of millets as a replacement of rice/wheat being supplied. For example, Chhattisgarh is planning to replace rice with millet once a week. Chandigarh, Madhya Pradesh, Gujarat, and Puducherry have proposed millets in the financial year 2023-24 and Uttar Pradesh has recently announced the inclusion of Bajra in its PM POSHAN meals.

Inclusion of fortified foods: All States/UTs have adopted one or more fortified foods to enhance the nutritional value of POSHAN meals. While fortified rice has been mainstreamed in the PM POSHAN scheme since April 2021, double fortified salt (DFS) and fortified oil have also found their place in the hot cooked meals served in schools in several States. In terms of nutritional contribution, fortified rice provides Vitamin B12, Folic acid, and Iron, while fortified oil provides Vitamins A and D, Iodine and Iron are available from DFS. The majority of States & UTs offer iodised salt, States like Delhi, Gujarat, Himachal Pradesh, Odisha, and Tamil Nadu provide double-fortified salt – fortified with iodine and iron. As for fortified oil, the scheme encourages States to use it. However, since the oil is procured at the local level, only a few States and UTs are using fortified oils.

Other additional food items: A few States also include traditional sweet recipes, on the menu as a special treat for children. Eight States provide sweet dishes as part of the PM POSHAN scheme (Annexure 6). While the majority States usually offer the sweet dishes once a week, some States/ UTs offer the sweet dishes at least three days a week.

Cost of Additional Foods

The cost incurred by the States to provide one hot cooked meal each school day is within the norms of Rs. 5.45 for Primary and Rs. 8.17 for Upper Primary (per child per day). However, it has been observed that the States and UTs that provide additional foods to supplement the regular meals meet the fund requirements through different sources. The contribution from the State is the largest, with 50% of States providing the additional foods through State funds, followed by 8% of States providing it through flexi funds[21]. The additional/ supplemental foods offered by the Non-Governmental Organizations (NGOs) or School Management Committees (SMCs) are limited to specific geographical areas or schools. The table in Annexure 7 describes the source and amount of additional funds the States and UTs contribute to supplemental foods.

Added Sugar

Added sugar[20] refers to sugar and sugar syrups added to foods and drinks during processing and preparation, and they include sucrose (table sugar), jaggery, honey, glucose, fructose, dextrose, etc. Adding sugar over and above what is naturally/inherently present increases caloric intake without adding any nutritive value. Refined, extracted sugars have no vitamins/minerals.

Sugar should be < 5% of the total energy requirements.

Concerns regarding Additional Foods

While the intention behind including additional foods is appreciable, it is essential to recognize that they may not always meet the necessary nutritional standards. Here are a few examples:

- An approach that certain States adopt involves providing ready-to-eat foods, primarily peanut brittle (*chikki*), while others offer millet-based ladoos, brittles (*chikki*), and cookies. These products are designed to augment the protein and calorie content of the meals. Unfortunately, they often contribute to empty calories due to their high sugar and jaggery content. Similarly, additional foods like *Sukhdi, Lapsi* (common in Gujarat and Dadra and Nagar Haveli and Daman and Diu), and *Ragi Java* (Finger millet) served during breakfast or as mid-meals also contain substantial amounts of sugar or jaggery.
- Another example involves certain States reporting a health drink containing a small quantity of milk powder as a substitute. This ragi-based health drink, provided to children in Bihar and Tripura, contains a notable amount of jaggery, which raises nutritional concerns. As per WHO, the total intake of free sugar should be <10% of the energy intake while the NIN has capped energy contribution from sugar to less than 5%. The ingredients of the health drink in Bihar include roasted finger millet, jaggery, soya, rice, salt, cinnamon, and turmeric. Per 100 gm, it provides 336 Kcal of energy, 8.39 gm of protein, 0.97 gm of fat, 70.89 gm of carbohydrates, and a concerning 37 gm of added sugar, in addition to vitamins and minerals. A 20 gm serving of this drink contains 7.4 gm of added sugar. In Tripura, the health drink comprises finger millet, jaggery, soya, rice, milk solids, salt, cinnamon, turmeric, maize starch, maltodextrin, and vanilla flavour. Per 100 gm, it provides 345 Kcal of energy, 15.74 gm of protein, 1.18 gm of fat, 65.94 gm of carbohydrates, and 26.82 gm of added sugar. A 20-gm serving of this drink contains 5.38 gm of added sugar.
- Goa and Dadra and Nagar Haveli and Daman and Diu provide Amulya Dairy Whitener as an alternative to fresh milk. The nutritional composition of Amulya Dairy Whitener per 100 gm includes 460 Kcal of energy, 50 gm of carbohydrates, 18 gm of added sugar, 20 gm of protein, and 20 gm of fat, along with other minerals and vitamins. Substituting dairy whitener for milk raises nutritional concerns, as it falls short of whole milk in terms of nutrient content. According to the analysis, the dairy whitener -Amulya, did not meet the requirement of Indian Standards since milk solids-not-fat (MSNF) was lower and added sugar was higher than the specified limits.
- In an effort to improve the protein quality of the meals many States offer eggs to the children during school meals, however considering that many children studying in these schools are vegetarian, schools offer alternative options to eggs, which do not necessarily provide the same quantity or quality of protein. For example, bananas are provided to children who do not consume eggs in the States of Jharkhand, Karnataka, Kerala, and Uttarakhand. However, bananas do not serve as a suitable substitute for eggs as a protein source. These States should consider incorporating more nutritionally robust options to ensure a balanced vegetarian protein alternative.

[20] NIN(2024) National Institute of Nutrition, Hyderabad. Dietary Guidelines for Indians, 2024

[21] States and UTs can utilize 5% of their Annual Work Plan & Budget for new interventions, provided they are not included under any other Central or State Schemes and there is no overlapping of activities.

CONCLUSION AND RECOMMENDATION

In summary, our analysis suggests that while the PM POSHAN scheme holds immense potential to make an impact on children's nutritional status and can considerably contribute towards reducing malnutrition by bridging the nutritional gaps, there are notable challenges in nutritional and food norms that are currently prescribed under the PM POSHAN scheme that limits the realisation of its full impact.

Since September 2015, the PM POSHAN scheme has aligned with the provisions of the NFSA 2013 provisions. The menu designed as per the current norms prioritise calorie fulfilment and cultural relevance and often falls short of providing well-rounded nutrition. Though the nutritional norms are aligned with EAR for calories and proteins, the source of the protein is not always of good quality. The allocation leans heavily towards carbohydrates primarily derived from cereals with little or no focus on the inclusion of micronutrient-rich green leafy vegetables and fruits. The source of fat in the meal is always the visible fat which is used for cooking. The food norms are also silent on the inclusion of animal sources good quality proteins which often limits the nutritional impacts of school meals. Unfortunately, PM POSHAN menus often lack diversity and rarely include nutrient-dense, micronutrient-rich foods due to budget constraints and technical capacities to innovate for improved nutritional value.

However, there exists an opportunity to revisit the food norms and PM POSHAN menus in alignment with the revision of the nutritional standards proposed in NFSA, as well as the RDA 2023. The revised norms lay more emphasis on protein quality as well as the inclusion of micronutrients in school meals, thus making them more comprehensive.

To enhance the effectiveness of the PM POSHAN scheme, the food norm revision should prioritise the inclusion of additional food groups such as dairy, eggs, non-vegetarian options (if culturally acceptable), fruits, and green leafy vegetables and invisible sources of fats to improve nutrition density as well as quality. The quantity of sugar and daily provision of sweetened beverages/ meals may be carefully limited to ensure a limited intake of empty calories. Natural sources of sugar may be promoted instead. Furthermore, portion sizes may be realigned based on age groups, considering children's appetites and capacity so that they receive adequate and quality nutrition.

KEY RECOMMENDATIONS

This report advocates for establishing healthy school meals as central to improving the nutritional status of children and adolescents so they can learn and thrive to achieve their development potential. Based on the analysis, the report put forth recommendations for improving the nutritional quality and reach of the PM POSHAN programme.

BROAD RECOMMENDATIONS

1

Enhance the focus of PM POSHAN on nutrition: While the PM POSHAN scheme already has nutrition as an objective, there is more required in terms of the scheme's nutrition/food norms and its on-ground implementation for the full realization of this objective.

2

Increase cost norms per child: There exists enough evidence to suggest that school feeding programmes have a high return on investment, therefore, it is recommended that the material cost under the PM POSHAN scheme may be increased to provide a diverse and more nutritious meal to the children.

3

Regularly assess students' nutritional status: To align with the objective of the scheme and measure the nutritional impact of the school meals being provided to school children, it is imperative to make the assessment of nutritional and health status a periodic activity to be repeated every three years. The Government can consider anthropometric assessment using body mass index alongside some biomarkers such as Hb level, Serum Retinol, Vitamin B12, and Vitamin D levels to assess prevalence of micronutrient deficiencies. The assessments would also be helpful for the policymakers to make necessary adjustments in the scheme for optimizing the benefits for school children.

4

Share best practices on healthy school meals: Considering that the implementation of the PM POSHAN scheme is decentralized, and different states attempt to provide the best possible nutrition solution within the limited resources with the support of technology and innovation, it is crucial that the unique, yet successful practices of the states is documented as best practices on healthy school meals and are widely disseminated with other States/UTs for replication.

ANALYSIS SPECIFIC RECOMMENDATIONS

- **Reduce cereal dominance:** To enhance the nutritional value and provide a broader range of food options, it is recommended that the food norms should be revised to include a variety of food sources, such as fruits and green leafy vegetables, and minimise the dominance of cereals which are quite high in the current norms. This may also be useful in reducing portion sizes.
- **Improve protein and fat quality & diversity in the meals:** To ensure that children receive the highest quality protein with the ideal amino acid composition, it is advisable to incorporate foods with a high DIAAS value into the meals. These foods, such as eggs, dairy products, roasted nuts, or dried fish powder (based on community preferences), should be added, to deliver essential amino acids through smaller portion sizes. The energy contribution from fat is lower than the recommendations and predominantly sourced from visible fat in cooking oils. The preference for vegetable oils and the absence of nuts, oilseeds, and animal fats like eggs and dairy products contribute to an imbalance in the Omega-6 to Omega-3 fatty acid ratio in PM POSHAN meals. To address this nutritional gap, it is advisable to incorporate locally available oilseeds such as sesame seeds, garden cress seeds, mustard seeds, niger seeds, sunflower seeds, and safflower seeds into the recipes. This inclusion would significantly improve the Omega-6 to Omega-3 ratio in the meals.
- **Food norms to specify vegetables, roots, and tubers, and green leafy vegetables as separate categories:** The current PM POSHAN food norms specify the quantity of vegetables to be included in school meals on a per-child basis. However, it does not categorically quantify the amount of green leafy and other vegetables; as a result, in the majority of cases, it is observed that potato is popularly used as a vegetable substitute. The NIN's dietary recommendation provide norms for three separate categories under vegetables which include other vegetables, roots and tubers, and green leafy vegetables depending on their micronutrient composition. It is recommended that PM POSHAN food norms be aligned to the NIN's dietary recommendations to ensure the inclusion of seasonal and micronutrient-rich vegetable sources, including alignment to suggested amounts for each category.
- **Periodic revision of menus:** Many States currently repeat the menu every week. This repetition restricts the variety of nutrients offered to the children and may result in monotony and potential disinterest among the children. Thus, it is recommended that States should periodically revise the menu to avoid monotony especially where meals are repeated within the same week.
- **Cautious use of sugar and sugary products:** Sugar is the primary source of empty calories in meals, and excess intake of simple sugar is also linked to an array of diseases. Therefore, it is recommended that the inclusion of sugary snacks and processed foods, etc, may be limited to one day per week. Alternatively, it may be substituted with natural, healthier, nutrient-dense traditional food options.
- **Guidance on alternative supplementary food options:** To enhance the nutritional value of the meals provided to school children, States and UTs have introduced additional foods like milk, eggs, ready-to-eat (RTE), and ready-to-cook (RTC) items. While the intention

behind these initiatives is commendable, in the absence of clear guidelines from the Centre, States are providing high-fat, salt, and sugar processed foods. To address these concerns, it is imperative to standardise the inclusion of additional foods and provide clear guidelines to the States regarding additional items (type, quantity, frequency) that can be added to the meals from a nutrition perspective.

- **Development of recipe booklet on millets:** Many States have tried to introduce millets into school meals through the provision of millet-based RTE foods such as ladoos or as part of health drinks/breakfast provided to school children. A few States are in the process of providing millets by substituting wheat and rice. There is a general paucity of knowledge about the various ways millets can be used and the number of recipes that can be prepared that are palatable as well as acceptable to children. Thus, to enable mainstreaming of millets in the PM POSHAN scheme, a guideline or recipe booklet may be developed, including several region-specific millet-based recipes.
- **Diversification of basket of fortified foods:** While the GoI encourages using fortified oils to prepare school meals, currently, only fortified rice is distributed through the Public Distribution System (PDS) and hence, in many States and UTs, it is the only fortified food. Considering that fortified rice alone cannot fulfill the micronutrient norms laid down in the NFSA gazette, there is a need for developing systems for mainstreaming other fortified staples such as wheat flour, oil, salt etc through supply to fair price shops. Further, there may be a need to augment the standards of micronutrients in the different fortifiable vehicles as they are not currently aligned to the new NFSA standards, 2023.

WAY FORWARD

Given the role that the meals served at school can play in meeting the nutritional requirements of school children, correcting gaps in intake, establishing nutritional behaviours etc, there is a need for more studies on the various aspects of the PM POSHAN scheme and this particular age group of children.

Annexures

Annexure 1: States & UT with variation in nutritional norms

Variation in nutritional norms				
	Calories (Kcal)		Protein (gm)	
	Primary	Upper Primary	Primary	Upper Primary
GoI PM POSHAN Nutritional norms	450	700	12	20
Andhra Pradesh	629	873	21	27
Dadra and Nagar Haveli and Daman and Diu	936	1522	17.6	35.9
Gujarat	525	742	12	20
Odisha	494	729	13.8	20.5
Tamil Nadu	553	734	18.1	21.6

Annexure 2: Breakfast provision in some States/UT under the PM POSHAN scheme

State	Number of days/week breakfast provided	Breakfast menu
Andhra Pradesh	Three days/week (Tuesday, Thursday & Saturday)	Hot *Ragi Java* made of finger millet powder and jaggery powder, 10 gm each in 150 ml of water per student
Gujarat	Six days/week	*Sukhdi*, chana chat, mix dal/usal, muthiya
Kerala (20% schools of the State)	Five days/week	No fixed menu, traditional Kerala-style breakfast (idli, appam, boiled rice)
Puducherry	Five days/week	100 ml fresh, toned milk +5 gm sugar/child
Tamil Nadu (for Primary children)	Five days/week	Upma, Khichdi and Pongal
Telangana	Three days/week (Tuesday, Thursday & Saturday)	Hot Ragi Java with jaggery 250 ml (10 gm of Ragi powder & 10 gm of Jaggery powder for 250 ml of Ragi Java
Tripura (specific district)	Six days/week	Boiled egg, seasonal fruit, cooked chana, peanuts

Annexure 3: Specific details of different types of Milk provided by States and UTs

State & Coverage	Type of Milk	Ingredients of milk	Nutritional composition of milk/100 ml/100 gm	Total Milk provided/ child	Amt. of protein and sugar through the milk provided/ child	% Contribution of added sugar to PM POSHAN Norms	% Contribution of added sugar to EAR*
Chhattisgarh Milk provided in specific districts	Flavoured soy milk, ready to drink.	Soybean, maltodextrin, sugar, tricalcium orthophosphat, stabilizer, artificial flavoring, and coloring substances	Energy- 78.24 Kcal, CHO- 13.80 gm, added sugar 12 gm, protein 3.02 gm, fat 1.30 gm, and other minerals and vitamin	100ml (P), 150 ml (UP) (1 day/week)	**Protein** 3 gm (P), 4.5 gm (UP) [Sugar – 12 gm (P), 18 gm (UP]	**10.6% (P); 10.2% (UP)**	**3.1% (P);** **3.0%(UP)**
Dadra and Nagar Haveli and Daman and Diu Milk is provided to specific children in one taluka.	Amulaya dairy whitener + micronutrient health mix	Dairy whitener - milk solids, sucrose	Dairy Whitener- Energy- 460 Kcal, CHO- 50 gm, added sugar 18 gm, protein 20 gm, fat 20 gm, and other minerals and vitamins.	10 gm milk powder reconstituted to 100 ml milk [6 days/ week]	**Protein** 2.47 [Sugar – 2.28 gm + 1 gm from =3.28 gm]	**2.9% (P); 1.8% (UP)**	**0.9% (P);** **0.6%(UP)**
Goa Milk is provided in specific schools in one taluka	Amulaya dairy whitener, micronutrient, + Micronutrient health mix	Dairy whitener - milk solids, sucrose.		5 gm of powder reconstituted to provide 100 ml milk (6 days/ week)	**Protein** 0.723 [Sugar 0.9 gm + 1 gm from Health mix = 1 gm]	**1.7% (P); 1.1% (UP)**	**0.5% (P);** **0.3%(UP)**
Gujarat Milk provided **Statewide**	Double-toned flavoured milk, ready-to-drink	Double Toned Milk, Sugar, and Vitamin A and D, sugar Permitted synthetic colors and flavors	Energy- 76Kcal, CHO- 12.2 gm, added sugar 7.5 gm, protein 3.5 gm, fat 1.5 gm, Vitamin A 250 IU, Vitamin D 20 IU	200ml [5 days /week]	**Protein** 7 gm [Sugar -15 gm]	**13% (P); 8.5% (UP)**	**3.9% (P);** **2.5%(UP)**

State & Coverage	Type of Milk	Ingredients of milk	Nutritional composition of milk/100 ml/100 gm	Total Milk provided/ child	Amt. of protein and sugar through the milk provided/ child	% Contribution of added sugar to PM POSHAN Norms	% Contribution of added sugar to EAR*
Haryana Milk provided Statewide	Sweetened flavoured skim milk powder	Skim milk solids and added sugar (pharma grade) permitted natural and synthetic colors and flavors	Energy- 372 Kcal, CHO- 68.56 gm, added sugar 33 gm, protein 23.06 gm, fat 1.12 gm, and other minerals and vitamin	20 gm of milk powder reconstituted to provide 200ml milk (3 days/week)	**Protein** 4.6 gm [Sugar 6.6 gm]	**5.8% (P); 3.7% (UP)**	**1.7% (P);** **1.1% (UP)**
Karnataka Milk is provided Statewide (grades 1st-10th)	Whole milk (toned) powder	Milk solids	Energy- 502 Kcal, CHO- 40 gm, added sugar 0 gm, protein 27 gm, fat 26 gm, and other minerals and vitamin	18 gm of milk powder reconstituted to provide 150ml milk (5 days/week)	**Protein** 4.86 gm [Sugar 10 gm /child added at the time of serving]	**8.9% (P); 5.7% (UP)**	**2.6% (P);** **1.7%(UP)**
Kerala Milk provided Statewide	Fresh whole milk	NA	Energy- 63.60 Kcal, CHO- 4 gm, added sugar 0 gm, protein 3.10 gm, fat 4 gm Calcium 144 mg	150ml [2 days/week]	**Protein** 4.56 gm [Sugar 5 gm added at the time of serving]	**4.4% (P); 2.8% (UP)**	**1.3% (P);** **0.8%(UP)**

State & Coverage	Type of Milk	Ingredients of milk	Nutritional composition of milk/100 ml/100 gm	Total Milk provided/ child	Amt. of protein and sugar through the milk provided/ child	% Contribution of added sugar to PM POSHAN Norms	% Contribution of added sugar to EAR*
Puducherry Milk provided Statewide	Fresh, toned milk + Micronutrient health mix	Whole toned milk	Energy- 59.4 Kcal, CHO- 4.8 gm, added sugar 0 gm, protein 3.3.gm, fat 3 gm Calcium 125 mg	100ml [5 days/ week]	**Protein** 3.3 gm [Sugar - 5 gm/child added at the time of serving]	**4.4% (P); 2.8% (UP)**	**1.3% (P);** **0.8% (UP)**
Rajasthan Milk provided Statewide	Skimmed milk powder	Milk solids, milk fat 1.5%	Energy- 353 Kcal, CHO- 51 gm, added sugar 0 gm, protein 36 gm, fat 1.5 gm, and other minerals and vitamin	15 gm (P), 20 gm (UP) milk powder reconstituted to 150 (P), 200 (UP)ml milk [6 days/ week]	**Protein** 5.4 gm (P), 7.2 gm (UP) [Sugar – 8.4 gm (P) & 10.2 gm (UP)/child is added at the time of serving]	**7.4% (P); 5.8% (UP)**	**2.2% (P);** **1.7%(UP)**
Uttar Pradesh Milk provided Statewide	Fresh boiled milk	NA	Energy- 63.60 Kcal, CHO- 4 gm, added sugar 0 gm, protein 3.10 gm, fat 4 gm Calcium 144 mg	150 ml (P), 200ml (UP) [1 day/week]	Protein -4.65 gm (P), 6.2 gm (UP) [Sugar – Nil]	0	0
Uttarakhand Milk provided Statewide	Flavoured skimmed milk powder	Skimmed Milk Solids, Added Sugar Vitamin A & D and Added Flavour	Energy- 372 Kcal, CHO- 68.56 gm, added sugar 33.3 gm, protein 23 gm, fat 1.12 gm, Vitamin A 1200 IU, Vitamin D2 700 IU	14 gm of milk powder reconstituted to 150 ml milk [1 day/ week]	Protein 3.22 [Sugar- 4.7 gm]	**4.1% (P); 2.6% (UP)**	**1.2% (P);** **0.8% (UP)**

**Average EAR has been computed for Primary and Upper Primary by combining 4-9 years and 10-15 years respectively*

Annexure 4: States & UTs including eggs in the PM POSHAN Scheme

States Providing eggs	Total Number of Eggs/Child/Week
Andaman & Nicobar Islands	5/6
Andhra Pradesh	5
Assam	3
Bihar	1
Jammu & Kashmir	1
Jharkhand	2
Karnataka	2
Kerala	1
Meghalaya	1
Mizoram	2
Odisha	2
Puducherry	3
Sikkim	1
Tamil Nadu	5
Telangana	3
Uttarakhand	1
West Bengal	2

Annexure 5: Provision of millets in the PM POSHAN scheme in select States

State	Provision of millets as	Geographical coverage	Name of the product
West Bengal	Additional food	Specific districts	Finger millet cookies
Chhattisgarh	Main lunch meal	Statewide	Kodo, kutki, mix millets
Haryana	Main lunch meal	Statewide	Bajra khichadi, gulgule, puri, biscuit
Andhra Pradesh	Breakfast meal	Statewide	Ragi Java
Sikkim	Main lunch meal	Specific schools	Dheero
Goa	Additional food	Specific districts	Ragi wheat Ladoo, millet groundnut chili
Karnataka	Main lunch meal	Specific districts	Finger millet
Telangana	Breakfast meal	Statewide	Ragi Java
Bihar	Additional food	Specific districts	Ragi and Jaggery Health Drink Powder
Tripura	Additional food	Specific districts	Ragi and Jaggery Milk Health Drink Powder

Annexure 6: States & UTs providing sweets in the PM POSHAN Meals

States & UTs providing Sweets	Frequency
Andhra Pradesh - Sweet pongal	Once a week
Dadra and Nagar Haveli and Daman and Diu - Lapsi	3 days
Gujarat - Fada Lapsi	Once a week
Haryana- Kheer, metha puda, gulgule, Meethe Chawal, Halwa	The State has not mentioned these items in the database. Although it is found in the govt. order
Himachal Pradesh - Kheer, Suji Halwa	The state has not mentioned any additional food items
Lakshwadeep - Payasam	Once a week
Madhya Pradesh - Halwa/Kheer	One day (The State has not mentioned these items in the database. It is mentioned in the menu shared by them)
Sikkim - Kheer	Someday – frequency not mentioned clearly

Annexure 7: Source and amount of additional funds spent by States & UTs for additional foods

State	Additional funds	Source of additional funds
Andaman & Nicobar	Rs. 6/child/day	UT grant
Andhra Pradesh	Egg; Rs. 5.50 & Chikki Rs. 1.98, Total; Rs. 7.48 /child/day Cooking cost; Primary: Rs. 0.40. Upper Primary: Rs. 0.43/child/day	State fund
Bihar	Rs.6/child/week	State fund
Chhattisgarh	Rs. 0.24 /child/day for Primary Soya chikki is provided to primary and upper primary children in 7-8 districts	State fund Flexi fund
Goa	Primary Rs. 2.55/child/day and Upper Primary – Rs.1.83/ child/day	State fund
Gujarat	Rs. 0.58 Balvatika & Primary /child/day Rs. 0.30 Upper Primary /child/day	State fund
Haryana	Rs. 6.40/child/day	State fund

State	Additional funds	Source of additional funds
Jharkhand	Rs. 6 per child two days a week	State fund
Karnataka	Hot milk for 1-10th grade students at Rs. 6.26/child/day for five days under Ksheera Bhagya Yojana Supplementary Nutritional Food (SNF)- Provision of SNF (Egg) to 1-8th grade students of 8 districts of Kalyana Karnataka region at Rs. 6.00/child/day for two days a week Supplementary Nutritional Food (Egg/Chikki/Banana)- Provision of SNF (Egg) to 1-8th grade students of the remaining 23 districts of Karnataka State at the rate of Rs. 6.00/child/day for two days in a week	State fund Flexi fund State Government Top Up fund.
Kerala	Rs. 4/child/day, 1,940 cr/annum	State fund
Mizoram	Primary Rs. 0.66, Upper Primary Rs. 0.18	State fund
Odisha	Primary Rs. 0.45 Upper Primary -Rs. 0.65	State fund
Puducherry	Primary Rs. 4.95/child/day Upper Primary Rs. 3.19/child/day	Central + UT funds
Rajasthan	Rs. 5.15/child/day for milk	State fund
Tamil Nadu	Primary Rs. 3.32/child/day Upper Primary – Rs.0.98/child/day	State fund
Telangana	Fortified Ragi Java with Jaggery – 3 days a week Egg - Rs. 5/child/day for 3 days a week	Cost sharing between the State and a trust State
Uttar Pradesh	Rs. 4 per week for seasonal fruit	State budget
Uttarakhand	Rs. 5/child	State fund

Notes

Notes

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