# Mid Day Meal Scheme and Its Significance in Eradicating Classroom Hunger in the Light of NEP 2020

Author: Dr. Sanjay Kumar, Assistant Professor, SCERT, Delhi

#### **Abstract**

The Mid Day Meal scheme is one of its kind and the biggest feeding program launched by the Government of India. This scheme provides all the students enrolled between the class 1st to 8th in government or government-aided schools and Madrasas one-time meal for at least 200 days a year. "National Policy of Education (NEP) 2020 envisages that the midday meal programme shall also be extended to the preparatory classes in primary schools. Mid Day Meal Scheme plays a significant role in the context of manifesting the principles of NEP 2020 i.e. access, equity, quality, affordability and accountability". "NEP observes that children are unable to learn optimally when they are undernourished or unwell. Many children belonging to disadvantaged sections of society reach with an empty stomach. Even children, who have a meal before they leave for school, hungry by the afternoon and are not able to concentrate. Mid-day meal helps children to overcome "classroom hunger". Many research studies reported that "Children are unable to learn optimally when they are undernourished or unwell. Hence, the nutrition and health (including mental health) of children will be addressed, through healthy meals and the introduction of well-trained social workers, counsellors, and community involvement into the schooling system," the policy said. Behind every policy, there are some issues that need to be studied carefully so that appropriate actions can be taken to reduce them. This article explored role, vision, expectations and malpractices issues with the Mid Day Meal Scheme.

Key word: Mid Day Meal, NEP, Nutrition, Classroom hunger

# **Background**

## Mid Day Meal Scheme

Mid Day Meal Scheme was launched by the Government of India, under which it guarantees to provide a one-time meal to all the students in the government and government-aided schools and madrasas. The Ministry of Human Resource Development launched the Mid Day Meal Scheme in India to guarantee a one-time meal to the students up to class 8 for at least 200 days a year. This is not a new scheme, as it was launched earlier in 1995 by the Central Government as the National Program for Nutritional Support to primary students. Later in 2007, it was renamed the Mid Day Meal Programme. This scheme is also covered under the National Food Security Act 2013.

# **National Programme of Mid-Day Meal**

The National Programme of Mid-Day Meal in Schools, popularly known as the Mid-Day Meal Scheme (MDMS), is an on-going centrally-sponsored scheme which covers all school children studying in classes 1 to 8 of government, government-aided schools, special training centres including 'Madarsas' supported under 'Samagra Shiksha'. "As per the provisions of National Food Security Act, 2013, children studying in classes 1 to 8 or within the age group of 6-14 years are entitled to one mid-day meal free of charge, every day except on school holidays, in all schools run by local bodies, government and government-aided schools so as to meet nutritional standards specified in the Act,". "However, some States and Union Territories provide additional items such as milk, egg, and fruits to students from their own resources,".

## **National Policy of Education (NEP-2020) Expectations:**

"NEP envisages that the midday meal programme shall also be extended to the preparatory classes in primary schools. Mid Day Meal Scheme plays a significant role in the context of manifesting the principles of NEP 2020 i.e. access, equity, quality, affordability and accountability".

"NEP observes that children are unable to learn optimally when they are undernourished or unwell. Many children belonging to disadvantaged sections of society reach with an empty stomach. Even children, who have a meal before they leave for school, hungry by the afternoon and are not able to concentrate. Mid-day meal helps children to overcome "classroom hunger"

The mid-day meals provided to students in government or aided schools should be supplemented by breakfast, the new National Education Policy (NEP) has proposed. The policy which was approved by the Union Cabinet on 29<sup>th</sup> Jjuly,2020 has noted that morning hours after a nutritious breakfast can be particularly productive for the study of cognitively more demanding subjects and hence recommended expansion of the mid-day meal scheme to include provisions for breakfast in schools.

"Children are unable to learn optimally when they are undernourished or unwell. Hence, the nutrition and health (including mental health) of children will be addressed, through healthy meals and the introduction of well-trained social workers, counsellors, and community involvement into the schooling system," the policy said.

#### NEP 2020 mandates Reforms made in food to improve education

In locations where hot meals are not possible, a simple but nutritious meal-- groundnuts or chana mixed with jaggery and local fruits may be provided. The revised policy has proposed that prior to the age of 5 every child will move to a 'preparatory class' or 'balavatika'. "The learning in the preparatory class shall be based primarily on play-based learning with a focus on developing cognitive, affective, and psychomotor abilities and early literacy and numeracy. The mid-day meal programme shall also be extended to the

preparatory classes in primary schools. "Health check-ups and growth monitoring that are available in the anganwadi system shall also be made available to preparatory Class students of anganwadi as well as of primary schools," the policy document said. "All school children shall undergo regular **health check-ups** especially for 100 pc immunization in schools and health cards will be issued to monitor the same," the policy said.

#### Tithi Bhojan Programme under MDM Mid-Day Meal Scheme

The Concept of "Tithi Bhojan", a community participation programme was initiated by the State Government of Gujarat in mid-day meal programme by relying on the traditional practice of providing food to a large number of people on special occasions such as festivals, anniversaries, birthdays, marriages, and days of national importance, etc. Members of the community provide nutritious and healthy food to the children as an additional food item or a full meal on such special occasions/festivals.

This is completely voluntary, and the people in the community contribute either a complete full meal or contribute food items in the form of sweets, namkeens, fruits or sprouts, etc. as an additional item. Tithi Bhojan is not a substitute to Midday Meal. This only supplements or complements Mid Day Meal.

The government of India has been writing to all the States and UTs to encourage the concept of Tithi Bhojan. It has been suggested that State/UTs may consider replicating the practice of Tithi Bhojan under Mid-Day Meal using the same nomenclature or adopt a local nomenclature suited to them. Necessary instructions with appropriate guidelines may be given to all schools covered under the Mid-Day Meal Scheme to facilitate and use Tithi Bhojan to enrich the implementation of the Mid-Day Meal. As per the information concepts similar to Tithi Bhojan have been adopted by the 11 States and UTs of Assam (Sampriti Bhojan), Andhra Pradesh, Punjab (Priti bhojan), Daman & Diu (Tithi Bhojan), Karnataka (Shalegagi Naavu Neevu), Madhya Pradesh, Maharastra (Sneh Bhojan), Chandigarh (Tithi Bhojan), Puducherry (Anna Dhanam), Haryana (Beti ka Janamdin) and Uttarakhand (Tithi Bhojan).

#### **Research Support**

# Importance of breakfast in attaining education

A researcher from the University of Washington and who is also an economists and nutrition experts at the International Food Policy Research Institute found that the midday meal scheme was associated with 13-32% of India's improvement in height-for-age z-scores (HAZ) between 2006 and 2016. The linkages between midday meals and lower stunting in the next generation were stronger in lower socio-economic strata and likely work through women's education, fertility, and use of health services, said the paper. IFPRI researcher Purnima Menon, one of the authors of the study, said the key takeaway is to "expand and improve school meals now for inter-generational pay-offs not too far down in time." Tweeting about the study, she said, "Girls in India finish school, get married and have children all in just a few years so school-based interventions can really help."

# Some of the Key Findings of the study are as following:

## **Stunting reduced:**

- Lower stunting among children with mothers who had access to free school lunches, shows data from 1993-2016.
- Stunting i.e., low height for age, is caused by long-term insufficient nutrient intake and frequent infections.
- Stunting generally occurs before age two, and effects are largely irreversible.
- The prevalence of stunting was significantly lower in areas where the mid scheme was implemented in 2005.

#### **Inter generational benefits:**

- Girls who had access to the free lunches provided at government schools, had children with a **higher height-to-age ratio** than those who did not.
- More than one in three Indian children are stunted, or too short for their age, which reflects **chronic under nutrition**.
- The fight against stunting has often focussed on **boosting nutrition** for young children, but nutritionists have long argued that **maternal health and well-being** is the key to reduce stunting in their offspring.

The importance of education to economic development cannot be overstated, considering its impact on several critical development measures. Not only does education provide better job market opportunities, leading to higher wages and an improved standard of living, but evidence also suggests that improved schooling inputs can lead to a greater sense of political awareness, reduced acceptance of traditional authority, and increased gender equality (Friedman et al 2011).

While the percentage of children enrolled in school in developing countries has increased from 82% to 89% since 1998 (Figure 1), far more action addressing this issue is needed. Achieving universal primary education requires a combination of rigorous evaluation and policy action, to successfully eliminate financial barriers to schooling for low-income and other marginalized children. A few policy approaches that have the potential to decrease the cost of schooling include the elimination of school fees, the expansion of transportation infrastructure to remote areas, an increased focus on improving overall classroom quality, and the provision of subsidized school lunches

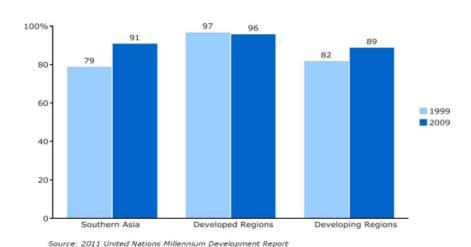


Figure 1: Adjusted Net Enrolment Ratio in Primary Education

"Furthermore, research shows that the morning hours after a nutritious breakfast can be particularly productive for the study of cognitively more demanding subjects and hence these hours may be leveraged by providing a simple but energizing breakfast in addition to mid-day meals,".

Numerous research studies support this correlation between poverty and low educational attainment, and find that entrenched, household characteristics are highly predictive of children's 5 academic success. In their analysis of the determinants of school participation in rural North India, Dreze and Kingdon (2001) find that the probability of school participation increases with higher levels of parental education, and that this relationship is particularly strong between parents and children of the same gender. Additionally, the effects of caste status, household wealth, and level of parental motivation are highly significant. Research conducted in Brazil supports a positive relationship between parent and child education levels, and suggests that higher levels of maternal education reduce intrahousehold gender biases that may prevent females from attending school (Emerson and Souza 2007). Finally, in their study of child labour and schooling decisions in Ghana, Canagarajah and Coulombe (1997) find that education decreases and child labour increases as household wealth declines, supporting the theory that schooling can be a financial burden for poorer families. If these results hold across regions, then the 69 million children not enrolled in school worldwide (United Nations 2010) and the 1.4 billion people living below the poverty line (World Bank 2008) will be less likely to afford education for their children, further perpetuating the cycle of poverty through future generations. Policy intervention is therefore needed to achieve the Millennium Development Goal of universal primary education and ensure that all children have equal access to education.

## Mid Day Meal Scheme in India: Historical Perspective

The history of the Mid Day Meal scheme in India dates back to 1925 by the Madras Municipal Corporation to fulfil the hunger demands of the disadvantaged children in the corporation. Despite all its economic opulence in certain areas, India lags in many social fields or parameters. One of them is child nourishment and nutrition. Forty-two percent of Indian children under the age of 5 are underweight. Most of these children belonging to economically backward families are preceding schooling to supplement their family's revenue. The most effective way to overcome this issue of poverty is through education. Education can drastically improve the quality of life of a family and the generations yet to come. When the necessities of a child, such as food or shelter, are not met, education often becomes the last priority. In 1928, the Keshav Academy of Calcutta implemented a compulsory 'Mid-day Tiffin' program for school boys. In 1941, Kerala started the School Lunch or School Meal Programme. Gradually, by the late 1970s, the Mid day meal scheme was enacted in the states of Karnataka, Tamil Nadu, Gujarat, and Pondicherry. Slowly it started spreading to many other states too. Considering the benefits and outcomes, the Government of India implemented this scheme nationwide. With this, the scheme was launched as the National Program for Nutritional Support to Primary Students, in the schools, in 1995. Later it was renamed the National Mid Day Meal Programme. In 2001, the Supreme Court of India passed an order for all the states to provide a properly cooked meal to all the students in school under Mid Day Meal Scheme (MDMS).

#### Launch of Mid Day Meal Scheme in India

The table provides the details of the launch of the Mid-Day Meal Scheme across the Indian States.

States of India	Mid day Meal Scheme was launched in	Remarks	
Tamil Nadu	1923	Fully extended to State in 1982.	
West Bengal	1928	Started in Calcutta city by Keshav Academy of Calcutta for school boys	
Maharashtra	1942	A free mid-day meal program started in Bombay in 1995.	
Karnataka	1946	Started in Bangalore city to distribute cooked rice and yogurt to children.	
Uttar Pradesh	1953	It introduced a voluntary scheme to give ground-nut, boiled gram, rice, and seasonal fruits.	
Kerala	1960	The scheme had been financially assisted by CARE (Cooperate American Relief Everywhere)	
Bihar	1995	Started to give 3kg rice per month to students.	

Andhra		Started to give 3kg rice per month to students with	
Pradesh	1995	80% more attendance in schools.	
Madhya Pradesh	1995	Provided Dalia or dry ration	
Rajasthan	1995	Students of Government Primary schools were provided with 3kg of rice per month.	
Arunachal Pradesh	1995	Extended completely to all schools in 2004.	
Punjab	1995	Students of Government Primary schools were provided with 3kg of wheat per month.	
Haryana	1995	Implemented in 44 blocks of the state	
Himachal Pradesh	1995	Dry ration was provided initially	
Jammu & Kashmir	1995	the dry ration was provided initially	
Meghalaya	1995	Students of Government Primary schools were provided with 3kg of rice per month.	
Jharkhand	2003	It was implemented in 19 districts initially.	

## Mid Day Meal Scheme in threshold

School feeding schemes are prevalent in developing nations not only because of their educational benefits but also for their nutritional benefits. Mid-day meal scheme acts as a source of "supplementary nutrition" for students, which helps for their healthy growth. The nutritional support given by the scheme to children is:

No.	Nutrition	Primary Class	Upper Primary Class
1	Protein	12 gms.	20 gms.
2	Calories	450 calories	700 calories

The main purpose of launching such a scheme was to increase the number of admissions to the school. States like Karnataka and Andhra Pradesh have actively participated in the **Mid Day Meal programme** and have implemented small initiatives like the introduction of the Kitchen Gardens, where the vegetables and fruits to be served to children are cultivated within the premises of the school.

#### **Objectives of Mid Day Meal Programme**

The MDMS was launched with some specific objectives in Mind. It started with the idea of the humanistic theory of motivation, which states that the primary needs of a person affect his/her action. Following are some important objectives of Mid Day Meal scheme:

- To increase the number of admissions in the schools and their retention, at least for primary education.
- To increase the nutrition level in the economically backward students by providing them with a nutritional meal.
- To abolish the existing nutritional gap between girls and boys.
- To reduce the system of castism among the students and bring them on one common platform for education.
- To eliminate classroom hunger.

# **Features of Mid Day Meal Scheme**

The Cooked Mid Day Meal scheme proposed to provide a meal containing 8-12 grams of proteins and 300 calories to all the students studying in classes I to V in Public and government-aided schools. The Mid-Day Meal was introduced in all the public and government-aided primary schools in April 2002. In June 2006, adequate micronutrients like iron, folic acid, and vitamin-A were also included in the meals. Listed below are some important features of the Mid Day Meal Scheme in India:

- It is the largest program in India that came to achieve the goal of a literate India.
- The Mid Day Meal Programme was launched by the Ministry of Education, formerly known as the Ministry of Human Resources and Development.
- It is a centrally launched scheme where the budget is divided between the center and state, and the center holds 60% of the total budget.
- Tamil Nadu became the first state to implement the Mid Day Meal scheme in its schools.
- In 2001, it was reformed as a cooked scheme where the children were eligible to get a fully prepared meal for 200 days in a year. The nutritional chart for this mail included an energy intake of 200 calories and a protein intake of about 8 grams.
- Primarily this scheme was launched for the Government and government-aided schools. Gradually, this concept was adopted for the children studying in the education guarantee system and alternative and innovative education.
- In 2004 the Mid Day Meal Scheme was revised for the following provisions -
- The central government provides the cooking cost.
- Transportation subsidy was imposed on states, where it was 100 rs. For the special states and 75 rs. For the other states.
- Monitoring, evaluation, and management of schemes started by the government.
- Providing the Mid Day Meal to the students during the summer vacations in the drought-prone areas of the country.
- This scheme was again revised in 2006, with certain provisions-
- The cooking costs were upgraded to Rs .1.80 in the northeast regional schools and 1.50 in all other regional schools.
- The calorie chart was revised, where the energy intake was increased to 400 calories, and the protein intake was increased to 12 grams.

- In 2007, another category of students was added to the scheme. The students coming from educationally backward classes became part of the scheme.
- In 2009, the madrasas were included in the list.
- A very important and interesting part is that the students are provided with additional funds and meals under the National Rural Health Mission.

# Mid Day Meal Scheme New Name (PM-POSHAN)

The Mid Day Meal Scheme has been renamed many times, and currently, it is called the **PM Poshan Shakti Mission**.

- Under the PM Poshan Shakti mission, the team successfully delivers meals to about 11 lakh Government schools.
- In terms of finances, there is no major change as compared to the formerly existing Midday Meal scheme.
- The PM Poshan Shakti Nirman scheme will be implemented after every 5 years, ie, 2021-22 to 2025-26.
- The finance distribution among the state and Centre remains the same as the Mid Day Meal programme, which is in the ratio of 60:40 in the case of general States and 90:10 in the case of special States.

# **Implementation of Mid Day Meal Scheme**

The implementation of Mid Day Meal took place in three models:

- The decentralized model is where meals are prepared on-site by the self-help groups and the local cooks.
- Centralized model in which the preparation of meals is done by external organizations and delivered the food to the schools.
- The international assistant under which the charity organizations run internationally at the Government schools.

## Mid Day Meal Rules: 2015

The Mid Day Meal scheme rules were published under the national food security act 2013 on 30 September 2015. The Mid Day Meal rules of 2015 are-

- Under the Mid Day Meal programme rules, the schools can utilize other funds in case the fund allotted for this scheme gets exhausted.
- If the school and external organizations fail to provide food to the children, then they are eligible for food allowances.
- The food served to the children in schools needs to be checked by the accredited labs monthly, which can be a random check.

• Suppose the students in a school don't get food for three consecutive days or 5 days a month. In that case, it becomes the responsibility of the state government to fix the issue immediately through a person or any agency.

# **Advantages of Mid Day Meal Scheme**

Some of the advantages of the Mid Day Meal Scheme in India are as follows:

- All the children who come in the bandwidth of age 1 to 8 years are eligible and entitled to get a healthy lunch packet daily, excluding the holidays.
- The schools need to purchase the AGMARK grade commodities to prepare meals.
- The Mid Day Meals are to be served to the students on the school ground only.
- Every school needs to have a mandatory cooking facility to prepare meals.
- The principal of the government school is entitled to use the other funds for a Mid Day Meal in case it gets exhausted. However, once they are refunded with the MDM budget, they need to return it to the government.
- The state food and drug administration are entitled to collect the samples of the food provided to the children randomly to check the quality of the meal.
- In case the food cannot be delivered to the schools due to unavoidable circumstances, the food allowances will be provided to the children, which is the number of food grains spent on one child's entitlement.

#### **Issues with Mid Day Meal Scheme**

Behind every policy, there are some issues that need to be studied carefully so that appropriate actions can be taken to reduce them. Check the malpractices and issues with the Mid Day Meal Scheme as listed here:

- Corruption: Corruption has been at the roots of the government system, and the MDM Scheme is also a part of it. There have been several cases where students were served plain chapati with salt and milk mixed with water.
- Caste-Based Discrimination: The concept was initiated to bring all the students together, but there are cases of caste-based discrimination where children are made to sit separately according to their castes.
- Menace of Malnutrition: the scheme was launched to curb the problem of malnutrition among children below the age of 10, but according to the National Family Health Survey, many states have been seen to record the rivers course and decreasing level of child nutrition.
- Global Hunger Index: India has fallen back to the 101st position in the **Global** hunger index from 94 in 2020.
- Global Nutrition Report: according to the Global nutrition report, there are no significant changes in the cases of Anaemia and childhood wasting in India.

#### **Discussion**

The criticality of implementation, monitoring and evaluation is an important part of MDM scheme. Implementation and monitoring mechanisms are set up and operated by the states under the guidelines of Centre. Monitoring is done at Panchayat, District and State levels. ICT also has been used significantly in the last few years. The reporting system is essential for such a vast system, in some states IVR (Interactive Voice Response) is implemented to know the responses of the daily meal system of the students. In addition, an MIS system is also developed and monitored from block level to national level and this MIS report is used by the Centre for further evaluation and improvements in implementing the scheme.

Current research provides policy makers and plan administrative impact/plan implementers a better way to consider student nutritional health and happiness with the MDM system in school. Studies on student satisfaction with various drawbacks of the MDM program will allow us to take better decisions on institutional arrangements by involving effective and accurate implementing agencies in providing MDM. Obviously, in addition to improved participation levels and food supply, the primary and general follow-on benefit is of social bonding which is an added advantage of progressing the MDM program, regardless of whether food is served hot, semi prepared or fully dry. Nevertheless, the emphasis should be on the excellence of the food they provide, social engagement happening, regular health up gradation and support services in the community besides demonstrating cleanliness among school children. Problems in these processes should also be emphasized. More prominence should also be given on doing well systemic implementation of MDM system.

# Conclusion

The MDM system is a flagship program aimed to universalisation of education and providing equitable and quality education to the children in India. The twin immediate objective of MDM scheme is improving the health of children by providing nutritious food to school children. Empirical evidence shows that this initiative has resulted in increased routine contribution rates of children in the lower upper core grades, as well as major changes in under nutrition in student management. Several evaluation studies are conducted by various organizations to determine the impact of the MDM program on children's enrolment, retention and nutritional value status and the institutional framework for timely delivery of cooked meals. It is argued that though there are complex stakeholders involved in the planning, implementation and monitoring of the country's school meal program, they lack proper coordination. In addition, many organisations, such as charitable associations, private corporations, NGOs, parents, teachers and central government bodies, which rarely specialize in school catering, are interested in the provision of cooked school meals. Health, nutrition and health investments are critical to unlocking children's growth potential. School health services could be critical in

coordination with MDM in conducting health check-up and nutritional status assessment of school children.

#### References

- Afridi, Farzana. (2007). "The Impact of School Meals on School Participation: Evidence from Rural India." Syracuse University.
- Behrman, Jere R., and Anil B. Deolalikar. (1987). "Will Developing Country Nutrition Improve with Income? A Case Study for Rural South India." Journal of Political Economy, 95(3): 492-507.
- Canagarajah, Sudharshan and Harold Coulombe. (1997). "Child Labor and Schooling in Ghana." Human Development Tech. Report (Africa Region). Washington, DC: World Bank.
- Deaton, Angus, and Jean Dreze. (2002). "Poverty and Inequality in India". Economic and Political Weekly, 37(36): 3729-3748.
- D. A. P. Bundy, S. Horton, D. T. Jamison, G. C. Patton, and N. de Silva, "Re-Imagining School Feeding: A High-Return Investment in Human Capital and Local Economies," Child Adolesc. Heal. Dev. Dis. Control Priorities, 2017.
- Deaton, Angus and Shankar Subramanian. (1996). "The Demand for Food and Calories." Journal of Political Economy 104(1): 133-162.
- Dreze, Jean and Geeta Gandhi Kingdon. (2001). "School Participation in Rural India". Review of Development Economics, 5(1): 1-24.
- Expert group discussion on "Supplementary Feeding Programmes (including Midday meal programme). Proceedings of the Nutrition Society of India. No. 29, National Institute of Nutrition, Hyderabad, 1983.
- Friedman, Willa, Michael Kremer, Edward Miguel, and Rebecca Thornton. (2011). "Education as Liberation?", NBER working paper. Government of India. (2011). Mid-Day Meal Scheme. Retrieved from http://india.gov.in/sectors/education/index.php?id=7.
- Glewwe, Paul, Hanan Jacoby, and Elizabeth M. King. (2000). "Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis." Journal of Public Economics 81(3): 345-368.

- H. P. S. Sachdev and T. Gera, "Preventing childhood anemia in India: Iron supplementation and beyond," European Journal of Clinical Nutrition. 2013, doi: 10.1038/ejcn.2012.212.
- Jacoby, Hanan G. (2002). "Is There an Intrahousehold Flypaper Effect? Evidence from a School Feeding Program." Economic Journal, 112(476): 196-221.
- Jacoby, Enrique, Santiago Cueston, and Ernesto Pollitt. (1996). "Benefits of a School Breakfast Program Among Andean Children in Huaraz. Peru." Food and Nutrition Bulletin, 17(1):54-64.
- Jalan, Jyotsna and Martin Ravallion. (2001). "Does Piped Water Reduce Diarrhea for Children in Rural India?" Journal of Econometrics, 112(1): 153-173.
- J. Ali and M. Akbar, "Understanding students' preferences on school mid-day meal menu in india," Br. Food J., 2015, doi: 10.1108/BFJ-03-2014-0099.
- J. Ali and M. Akbar, "Pupils' satisfaction with school mid-day meal program," Br. Food J., 2015, doi: 10.1108/bfj-01-2015-0002.
- Kremer, Michael, Edward Miguel, and Rebecca Thornton. (2009). "Incentives to Learn: Merit Scholarships that Pay Kids to Do Well", Review of Economics and Statistics, 91(3), 1829-1863.
- L. Verma, "Impact of Mid day Meal Programme in India: A review," Int. J. Multidiscip. Approach Stud., 2015.
- L. Gopal and Y. Nagaraju, "Use of renewable energy to enhance sustainability of the mid-day meal program in schools," Energy Sustain. Dev., 2013, doi: 10.1016/j.esd.2013.05.002.
- Lechner, Michael. (1999). "Earnings and Employment Effects of Continuous Off-the-Job
  Training in East Germany after Unification." Journal of Business and Economic
  Statistics,
  17(1): 74-90.
- M. Preston and N. Rodríguez-Quintana, "Number and type of meals consumed by children in a subset of schools in San Juan, Puerto Rico," P. R. Health Sci. J., 2015.

- M. C. Turnin et al., "Effect of Nutritional Intervention on Food Choices of French Students in Middle School Cafeterias, Using an Interactive Educational Software Program (Nutri-Advice)," J. Nutr. Educ. Behav., 2016, doi: 10.1016/j.jneb.2015.09.011.
- M. E. Lehnerd, "Investigating the adoption and impact of nutrition incentive and farm to school programs," Diss. Abstr. Int. Sect. B Sci. Eng., 2018.
- M. Chutani, "School lunch program in India: Background, objectives and components," Asia Pac. J. Clin. Nutr., 2012, doi: 10.6133/apjcn.2012.21.1.21.
- Miguel, Edward and Michael Kremer. (2004). "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." Econometrica, 72(1), 159-217.
- National Nutrition Monitoring Bureau Annual Report. National Institute of Nutrition, (ICMR), Hyderabad, 1992.
- Poverty Program." Journal of Development Economics, 74(1): 199-250. Strauss, John, and Duncan Thomas. (1998). "Health, Nutrition and Economic Development." Journal of Economic Literature, 36(2): 766-817.
- P. A.M. and R.-Q. N., "Number and Type of Meals consumed by Children in a Subset of Schools in San Juan, Puerto Rico," P. R. Health Sci. J., 2015.
- P. Ramachandran, "School Mid-day Meal Programme in India: Past, Present, and Future," Indian Journal of Pediatrics. 2019, doi: 10.1007/s12098-018-02845-9.
- Ravallion, Martin, and Quentin T. Wodon. (2000). "Does Child Labor Displace Schooling?
   Evidence on Behavioral Responses to an Enrollment Subsidy." The Economic Journal,

110(462): 158-175.

- Reinikka, Ritva and Jakob Svensson. (2004). "Local Capture: Evidence from a Central
  - Government Transfer Program in Uganda", Quarterly Journal of Economics, 199(2): 679-

706.

• Rosenbaum, Paul R. and Donald B. Rubin. (1983). "The Central Role of the Propensity Score in Observational Studies of Causal Effects." Biometrica, 70: 41-55.

- Swaminathan MC, Singh R, Jyothi KK, et al. Evaluation of . Midday Meal Programme in Hyderabad City, Andhra Pradesh. *Ind J Pub Health* 1964; 8: 65–77.
- Shubhada Kanani, Tara Gopaldas. A Nutritional Status Study on Underprivileged Midday Meal Programme Beneficiary of India. *Nutr Research* 1988; 8: 995–1004.
- S. Banerjee, A. Dias, R. Shinkre, and V. Patel, "Under-nutrition among adolescents: A survey in five secondary schools in rural Goa," Natl. Med. J. India, 2011.
- The World Bank. (2008, September 16). Press Release: New Data Shows 1.4 Billion Live on Less than U.S. \$1.25 A Day, But Progress Against Poverty Remains Strong. Washington, DC.
- United Nations. (2010, June 20-22). High-level Plenary Meeting of the General Assembly. New York, NY. Retrieved from ttp://www.un.org/millenniumgoals/pdf/MDG\_FS\_2\_EN.pdf.
- United Nations. (2011). The Millennium Development Goals Report 2011. New York, NY.
- Vermeersch, Christel, and Michael Kremer. (2005). "School Meals, Education Achievement and School Competition: Evidence from a Randomized Evaluation." World Bank Working Paper 3523.
- Y. Gajpal, V. Roy, and B. S. Sahay, "Vehicle routing for a mid-day meal delivery distribution system," Heliyon, 2019, doi: 10.1016/j.heliyon.2019.e01158.