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Protein Adequacy of Mid Day Meal on Portion Consumption by 5-6 Year Olds of Delhi Government School

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Abstract

Mid Day meal Scheme was first implemented for the children aged between 6-11 years to maximize enrolment and reduce school dropout rates, which were important from the viewpoint of universalisation of elementary education as well as achievement of higher literacy rates in the country (NFI report, 2006). On estimating protein content of MDM menu it was observed, none of the menus met protein content norm. This can be attributed to dilution while cooking or transportation, less appetite of the child and food cooked in kitchen are not being standardized.PE% of the Mid day meal does not match PE% by RDA. Hence protein fortification and suitable correction in menu like aloo puri/ kadhi rice is needed from nutrition stand point.

Keywords: Estimation, Norms, Calorie, Portion, Fortification.

Background

The National Program of Nutritional Support to Primary Education, commonly known as the Mid-Day Meal Scheme (MDMS), was launched in India in August 1995.The MDMS covers all students in primary schools, run or funded by the government throughout the country. While initially the MDMS provided 3 kilograms of food grain per student per month, on November 28, 2001, India's apex court, the Supreme Court, directed all state governments to provide cooked mid-day meals instead of raw food grains. The target of Directorate of Education for protein is 12gms for primary classes.

Introduction

The programme envisaged the provision of cooked meals processed food of calorific have equivalent to 100 gm of wheat/rice for children studying in classes I-V in all Government, local body and Government aided primary schools(free of cost). The nutritional value of meals for primary was fixed 450kcal and 12gm protein derived from 100gm of cereal for upper primary children will be fixed at 700 calories derived from 150 gm of cereals and 20 gm of protein.

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Material and Methods

Participation of the study was students of class first. The study was conducted selected schools of Delhi Government. The protein content of the menu obtained using Kjeldahl apparatus. According to the revised nutrition norms of MDM (GOI, 2011), the protein content of Mid Day Meal of primary classes should be 12gm. In present study To estimate the protein content of MDM consumed by the children, duplicate samples of the food consumed by the children were picked from six schools. The schools were selected purposively based on co-operation from the school authorities. A total of 12 samples (two samples per school one boy and one girl) were picked from the schools. All the samples were analysed in duplicates. Samples were bring to the Lady Irwin college lab for protein estimation.

Table I. Revised Nutritional Norms of Mid Day Meal scheme

S No	Nutritional Content	Revised Norms as per NP-NSPE,2004	Revised Norms as per NP-NSPE,2006	
		Primary	Primary	Upper Primary
1	Calorie	300 kcal	450 kcal	700 kcal
2	Protein	8-12 gm	12 gm	20 gm
3	Micronutrients	Not Prescribe	Adequate quantities of micronutrients like iron, folic acid, vitamin-A etc.	Adequate quantities of micronutrients like iron, folic acid, vitamin-A etc.

Source: MSSRF – UNWFP (2008)

Table II. Protein content of cooked Mid Day Meal consumed by selected children

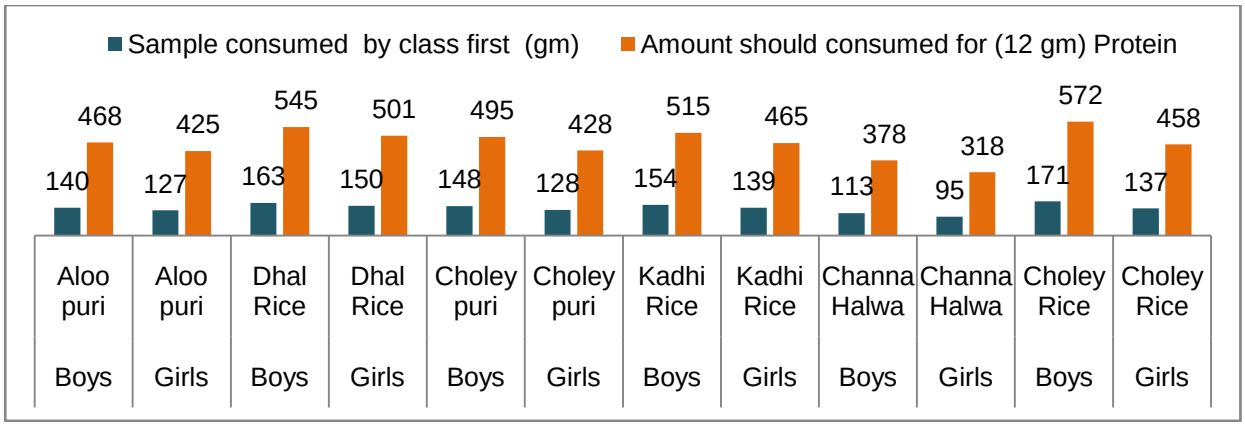
MDM menu	Mean MDM eaten by Girls (gm)	Mean MDM eaten by Boys (gm)	Mean protein in food of Girls (gm)	Mean protein in food of Boys (gm)	PER % Girls	PER% Boys
Aloo puri	127	140	3.41	3.59	3.03	3.19
Dhal rice	150	163	4.10	4.69	3.65	4.17
Chole Puri	128	148	6.95	7.97	6.18	7.08
Kadhi Rice	139	154	6.47	4.74	5.75	4.21
Channa Halwa	95	113	3.98	5.11	3.54	4.54
Chole Rice	137	171	4.29	5.26	3.81	4.68

PER (Protein energy ratio), PER for one day= 20 X 4 X 100/1350, PER% for 5-10 years is 5.9% (ICMR, 2010)

Interpretation

On estimating of protein it was observed none of the menus meet protein content norm of 12 gm for primary classes. Shown in Table II PER% of all cooked menus was low and ranged from 3.59%-7.97% and 3.41%-6.95% for boys and girls respectively. A Punjab study reported that MDM in school provides 350-386 Kcal of energy 10.9-11.9 gm protein and contribution of micronutrients is negligible (Mehta et al, 2013). As per the reports of 2012-13, MDM menu does meet 30-60% of the requirements. *Chole Puri* had the highest nutrient content acceptability but the children do not like it. *Chole Puri* met the almost 50% protein requirement of MDM norms in boys as well as in girls.But other menus providing >50% of MDM norms requirements. *Aloo puri* provides only almost 28% protein adequacy in both boys and girls, it indicates *aloo puri* is low protein menu.

Figure I. Comparison of consumed and recommended for target MDM protein norms by 5-6 year school children



Interpretation

The target of DoE for protein is 12gms for primary classes. As from the protein estimation we found that only *chole puri* was availing 50% of recommendations while other menus were below the 50% of protein recommendation. Aloo puri was least amount of protein requirement. For class first the amount was consumed 75-171 gms but to get the target of recommended by DoE is 12 gm and to get the target of 12 gms the child should consume 318-572 gms wet weight of MDM, Which is feasibly not possible by 5-6 year of children shown in Figure I. So the 12 gm target cannot be met on present menus as the amount to be consumed would be bulky and non feasible for 5-6 year olds.1/3 RDA is only 7 gm protein for 5-6 year old which may be met from 1 or 2 menus. PE% of the MDM does not match PE% by RDA. Hence protein fortification and suitable correction in menu like *aloo puri/ kadhi rice* is needed from nutrition stand point.

Limitations

Kitchen visit was not taken so raw ingredients were not measured for accuracy of results.

Summary and Conclusion

PE% of all cooked menus was low and ranged from 3.19%-7.08% and 3.03%- 6.18% for boys and girls. Protein content of cooked MDM menu do not meet the protein content norms of MDM as per MHRD (of 12 gm for primary). To get that 12 gm of target child should consume more than double which is feasibly not possible. 12 gm target cannot be met on present menus as the amount to be consumed would be bulky and non feasible for 5-6 year olds.

Suggestions

Kitchen visit should be done for perfection of results. Sample of more number of children can be taken.

Acknowledgment

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