MILK IN NUTRITION PROGRAMS –AS SUPPLEMENTATION

Vanthi Ekal. I[1], Dr. K. Silambu selvi[2*], Nandhini. G[3]

Article History: Received: 12.12.2022 **Revised:** 29.01.2023 **Accepted:** 15.03.2023

Abstract

According to National Family Health Survey (NFHS)-4 - 38% of preschoolers below 5 years of age had stunted growth and the proportion is increased in rural areas (41%) and decreased in urban areas (31%). All of the essential amino acids are present in dairy items making it a complete food that aids in lowering malnutrition rates. As per the literature review, which states that milk and milk-based supplementary food has better nutritional benefits in terms of better amino acid profile, good bioavailable calcium and potassium, free of anti nutrients and contributes towards linear growth. The weight and BMI of children who are at risk of malnutrition improve dramatically after consuming milk or a milk-based supplement. In India there are various Nutrition Program schemes where there is free supply of food grains, pulses, vegetables and fruits supplied to the primary and upper primary excluding dairy products. India being the highest milk producer (21% globally), in 2020 – 2021 can include free supply of milk in supplementary nutrition program which can help in reducing prevalence of malnutrition especially in reducing stunting and underweight. Milk is shown to have a great impact on cognitive and developmental milestones among school children. Appropriate nutritional care during childhood could reduce morbidity-mortality due to PEM.

Keywords: Milk, Supplement, Malnutrition children, Nutrition program

[1] Research scholar, Department of Clinical Nutrition and Dietetics, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, India.
[2*]Assisstant Professor, Department of Clinical Nutrition and Dietetics, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, India
[3]Lecturer, Department of Clinical Nutrition and Dietetics, SRM Medical College Hospital and Research Centre, SRMIST, Kattankulathur, Chengalpattu, India.

Corrspoding mail: [2]*silambuk1@srmist.edu.in

DOI: 10.31838/ecb/2023.12.s2.114

1. Introduction

Protein energy malnutrition is a serious public health issue in India. Over 5 million preschoolers in India suffer severe wasting, making up about 28 million (15.5%) of the total [Ahmed et al, 2014]. According to National Family Health Survey (NFHS)-4 - 38% of preschoolers under 5 are stunted and the ratio is greater in rural areas (41%) and lower in urban areas (31%) [Rana et al., 2022]. According to World Health Organization, protein energy malnutrition (PEM) refers to "an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function" [Onis MD, 1997]. PEM is more prevalent among school going children in developing countries and its consequences ranges from physical to cognitive growth and are prone to infections. The most important period of child's life time gets affected because of this and it impairs the growth of the child later in life. [Bhutia DT, 2014, Gragnolati et al, 2005, Park K. 2007]. The main causes of malnutrition are increased density of population along with poor income, food insecurity, poor hygiene and clean drinking water. There are many other factors that do not allow the scenario of malnutrition to change in developing counties. High prevalence of infection along with poor diets which are deficit in macronutrients and micronutrients, together make a combination of in causing child malnutrition [Nga et al, 2013]. The major goals of nutrition programs to help in decreasing prevalence of malnutrition are to promote good nutrition practices, adequate micronutrient intake, prevent and treat severe acute malnutrition. The goals can be achieved by taking a life-cycle approach which starts from maternal nutrition and prevention of low birth-weight, breastfeeding and weaning, by preventing and treating micronutrient deficiencies thereby preventing severe acute malnutrition [UNICEF 2013]. This article describes different Nutrition programs and analyzing its adequacy in meeting the nutritional requirement. To provide additional nutrients to target groups to fulfill the gap between food intake and requirement.

Nutrition Supplementary Programs

In order to address the food insecurity issue various steps are being taken by the government. In India some of the major Nutritional Programs are - Integrated Child Development Services Program (ICDS), Special Nutrition Program (SNP), PM-POSHAN (Pradhan Mantri Poshan Shakti Nirman) Scheme, Vitamin A Prophylaxis Program, Prophylaxis against Nutritional Anaemia and National Iodine Deficiency Disorder Control Program.

Special Nutrition Program (SNP) - Adequate amount of food is made available to the children in rural areas for their optimum growth and development through Special Nutrition Program (SNP). This program contributes 300 calories and 10 grams of protein to preschool children as supplementary feeding and about 500 calories and 25 grams of protein to pregnant and lactating mothers for six days in a week. This program was implemented as a Minimum Need Program. It was taken up in rural areas for those who were mostly of poor socio economic group in tribal and urban slums. [NIHFW, GOI]

Integrated Child Development Services (ICDS) Scheme – It is basically designed to reduce the gap between the Recommended Dietary Allowance (RDA) and the Average Daily Intake (ADI). The beneficiaries under this scheme are preschoolers in the age group of 0-6 years, pregnant women and lactating mothers. The provision of supplementary nutrition under ICDS scheme prescribed for various categories of beneficiaries are as follows in Tab.1:

Table:1 Nutritional Norms in ICDS (since February, 2009)

Beneficiaries	Calories (Kcals)	Protein (g)
Children (6 mon - 3 yrs)	500	12 - 15
Children (3 yrs - 6 yrs)	500	12 - 15
Severely malnourished Children (SAM) (6 mon - 3 yrs)	800	20 - 25
Pregnant women and lactating mothers	600	18 - 20

PM-POSHAN (Pradhan Mantri Poshan Shakti Nirman) Scheme, With a view to enhance enrolment, retention and attendance and simultaneously improving nutritional levels among children, the National Programme of Nutritional Support to Primary Education (NP-NSPE) was launched as a Centrally Sponsored Scheme and was revised from time to time.

There is a free supply of cereals and grains at the rate of 100 grams per child per school day at primary and at the rate of 150 grams per child per school day at upper primary. Other food items include pulses, vegetables, oil, fat, salt and condiments as mentioned in the Tab.2 [PM POSHAN, GOI].

Table.2 Food norm with effect from 1-12-2009

S. No.	Items	Quantity per day/Child	
		Primary	Upper Primary

1	Food grains	100 grams	150 grams
2	Pulses	20 grams	30 grams
3	Vegetables (leafy also)	50 grams	75 grams
4	Oil & fat	5 grams	7.5 grams
5	Salt & condiments	As per need	As per need

Role of different food groups in balanced diet.
There are major five food groups as per ICMR as mentioned in the Tab. 3 below. The Five food groups provide different macro and micro nutrients to the body. The nutrition programs include grains, pulses, vegetables, fats and oils and sugar excluding the complete dairy food 'Milk'. From the above supplementary programs it is observed that the program approximately contributes to 30 to 35% of daily energy needs and 70 to 80% of daily protein requirements.

Table.3 ICMR Five Food Groups

Food Group	Main Nutrients
1. Cereals and its Products : Rice, rice flakes, wheat, wheat flour, ragi, maize, bajra, barley and jowar.	Energy, protein, invisible fat, fibre, iron, folic acid, vitamin - B1 and B2.
2. Pulses and Legumes : Bengal gram, green gram, black gram, red gram, Lentil and dhals, peas, cowpea, soyabeans and beans.	Energy, protein, invisible fat, fibre, iron, calcium, folic acid, vitamin –B1 and B2.
3. Milk, Meat and Its Products : Milk, skimmed milk, curd and cheese. Fish, liver, meat, chicken and egg.	Energy, protein, fat, calcium, Vitamin –B2 and B12.
4. Fruits and Vegetables : **Fruits :** Mango, orange, sweet lime, papaya, watermelon, guava and ripe tomato.	Carotenoids, Fibre and Vitamin –C.
Vegetables (Green Leafy) : Amaranth, coriander leaves, fenugreek leaves, mustard leaves, spinach and drumstick.	Invisible fats, fibre, iron, folic acid, calcium, carotenoids and Vitamin – B2.
Other Vegetables : Carrots, cauliflower, capsicum, brinjal, ladies fingers, beans, onion and drumstick.	Fibre, carotenoids, folic acid and calcium.
5. Fats and Sugars : **Fats:** Butter, hydrogenated oil, groundnut oil, mustard oil, coconut oil and ghee.	Energy, Fat and Essential Fatty Acids
Sugars : Sugar and Jaggery	Energy

Source: ICMR

The daily dietary allowances for preschool children between the age of 4 to 6 are 1350 kcals and 20g of protein. The daily requirement of milk for a school going child is 500g per day. The major portion of protein can be given through milk as it is easily consumable and palatable. Milk is a complete food and is rich in Protein, Fat, Vitamin –B2, Vitamin –B12, Calcium. Milk has a store of increased concentration of proteins, especially the caseins, filled with amino acids; fat in the form of fat globules and free fatty acids; carbohydrate, mostly in the form of lactose and oligosaccharides; and different types of essential micronutrients, like vitamins, minerals and nucleotides. [Wheeler et al. 2012]. The weight and BMI of children who are at risk of malnutrition improve dramatically after consuming milk or a milk-based supplement [Kumar C et al. 2021]. Milk is therefore recommended as one of the important food to be included in the Nutrition Programs. At present India is the highest producer of milk in the world, which contributes to 23% of global milk production. Globally an increase in two percent of milk production is seen whereas the growth rate of India‘s milk production is increasing at the rate of more than six percent. Compared to the world average the per capita availability of milk in India is much higher than any other country. Since 3 decades from the 1980s through 2000s, the daily milk consumption in the country has increased from as low as 107 grams per person in 1970 to 427 grams per person in 2020-21 which is much higher when compared to the world average of 322 grams per day during 2021. [MFAHD, NDDB]

2. Conclusion

India ranking at the top of the world with 21% in the production of milk, the daily milk consumption in the country is 427g per person. The government of Tamilnadu has plans to incorporate free milk for breakfast in supplementary nutrition programs, which is a good initiave to help in fighting malnutrition. Hence the balance between milk production and eradication of malnutrition can go hand in hand if milk or milk based supplementaion is provided to the school going children everyday under supplementary nutrition programs.

3. References

Ahmed, T., Hossain, M., Mahfuz, M., Choudhury, N., Hossain, M. M., Bhandari, N., Lin, M. M., Joshi, P. C., Angdembe, M. R., Wickramasinghe, V. P., Hossain, S. M., Shahjahan, M., Irianto, S. E., Soofi, S., & Bhutta, Z. (2014). Severe acute malnutrition in Asia. Food and nutrition bulletin, 35(2 Suppl), S14–S26. https://doi.org/10.1177/15648265140352S103

Rana, R. K., Nag, A. R., Soren, S., Kumar, D., Kumar, C., Sagar, V., Singh, S. B., Hedayetullah, S., & Kujur, A. (2022). Impact of milk on malnutrition and cognitive skills among school children: Evidence from gift milk initiative from a tribal state of India. Journal of family medicine and primary care, 11(6), 2945–2951. https://doi.org/10.4103/jfmpc.jfmpc_2425_21

De Onis, Mercedes, Blössner, Monika & World Health Organization. Programme of Nutrition. (1997). WHO global database on child growth and malnutrition / compiled by Mercedis de Onis and Monika Blössner. World Health Organization. https://apps.who.int/iris/handle/10665/63750

Bhutia D. T. (2014). Protein energy malnutrition in India: the plight of our under five children. Journal of family medicine and primary care, 3(1), 63–67. https://doi.org/10.4103/2249-4863.130279

“Gragnolati, Michele; Shekar, Meera; Das Gupta, Monica; Bredenkamp, Caryn; Lee, Yi-Kyoung. 2005. India's Undernourished Children : A Call for Reform and Action. HNP Discussion paper series;. World Bank, Washington, DC.©World Bank. https://openknowledge.worldbank.org/handle/10986/13644 License: CC BY 3.0 IGO.”[Google Scholar]

Park K. Parks Textbook of Preventive and Social Medicine. 19th ed. Jabalpur: Banarsidas Bhanot; 2007. Nutrition and health; p. 507. [Google Scholar]

Nga, T. T., Nguyen, M., Mathisen, R., Hoa, doT. B., Minh, N. H., Berger, J., & Wieringa, F. T. (2013). Acceptability and impact on anthropometry of a locally developed ready-to-use therapeutic food in pre-school children in Vietnam. Nutrition journal, 12,120. https://doi.org/10.1186/1475-2891-12-120.

UNICEF: Improving Child Nutrition: The achievable imperative for global progress. Chapter 4 nutrition specific interventions: April 2013; Pg.17

National Institute of Health and Family Welfare [NIHFW] - http://www.nihfw.org/NationalHealthProgramme/SNP.html

Press Information Bureau, Government of India, Ministry of Women and Child Development, 21 Feb 2014. https://pib.gov.in

Meal provision, Ministry of Education, Govt. Of India. https://pmposhan.education.gov.in/

Wheeler, T. T., Smolenski, G. A., Harris, D. P., Gupta, S. K., Haigh, B. J., Broadhurst, M. K., ... & Stelwagen, K. (2012). Host-defence-related proteins in cows' milk. Animal, 6(3), 415-422.

Kumar, C., Rana, R. K., Kumar, M., Kujur, A., Kashyap, V., Singh, S. B., & Kumar, D. (2021). Effect of milk supplementation on the status of micronutrients among rural school children aged 5–19 years in a tribal predominating district of India. BMJ Nutrition, Prevention & Health, 4(2), 463.

Ministry of Fisheries, Animal Husbandry & Dairying, Milk Production in India, The Journey of India’s Dairy Sector, India: From a milk-deficit nation to a milk-products exporter, Posted On: 07 SEP 2022 11:41AM

https://www.nddb.coop/information/stats/milkprodindia National Dairy Development Board [NDDB].