

THE LIFE OF THE WHITE REVOLUTION: PAST, PRESENT AND THE FUTURE

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ABSTRACT

This research paper traces the life of the White Revolution from the time it was founded by Dr. Verghese Kurien in 1970. The achievements of Operation Flood, which is one of the largest rural development programmes worldwide have been highlighted. The authors delve deeply into the Right to Adequate Food and the legislations that are aimed at ensuring food security and addressing malnutrition. Extending the right to adequate food to include the right to milk and dairy products in light of the nutritional value that they possess, the authors delve into the Government policies and schemes that have recognized this. The paper has been written employing the doctrinal methodology. The authors have focused on questions regarding the nutritional importance of milk and dairy products in everyday diet. Additionally, the present operation and functioning of the White Revolution across different states has been delineated. Lastly, the paper confronts the present day challenges to the White Revolution by proposing policy measures.

Keywords- White Revolution, Dairy, Nutrition, Health, Policy

INTRODUCTION

“Dairying is an Instrument of Change. True development must be such that it brings the modernization process to the service of our majority, namely the rural poor. It must bring to these people not only the pittance which they need for their humble diet but also the means whereby they can act together to obtain for themselves the benefits of modern science and organization and in that process the means whereby they can build for themselves, in every village, a society which is at peace with itself, concerned with its neighbours and able to see a bright for all its children.”

— *Verghese Kurien*

26th November is celebrated as Constitution Day. Coincidentally, it is also celebrated as National Milk Day, commemorating the birthday of Dr. Verghese Kurien, who is regarded as the Father of the White Revolution.

HISTORY OF THE WHITE REVOLUTION

The White Revolution of 1970 introduced a cooperative approach to enhancing milk production as well as profits to the farmers in the country. This is when the National Dairy Development

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Board (NDDB) was established in order to organize dairy development through co-operative societies. Co-operative societies are representative entities owned and managed by the milk producers. The first dairy development programme through co-operative societies was implemented in the state of Gujarat, which saw a successful run in Anand District under the leadership of Dr. Verghese Kurien who was the chairman of NDDB and Amul, a single cooperative dairy which is credited for the success of the programme. The main project of the NDDB was Operation Flood launched in 1970. This programme helped India transition from a milk-deficient nation to the world's largest milk producer. It is one of the largest rural development programmes worldwide. A National Milk Grid was established under this programme. Today, the Grid links milk producers across the country with consumers in over 700 towns and cities. It has helped reduce seasonal and regional price variations while ensuring that the producer gets fair market prices. The three main objectives of Operation Flood are:

1. Increase milk production ("a flood of milk")
2. Augment rural incomes
3. Reasonable prices for consumers

Operation Flood was implemented in three phases³.

1. **Phase I- (1970-1980)** was financed by the sale of skimmed milk powder and butter oil which was gifted by the EU then EEC through the WFP (World Food Programme). NDDB planned and negotiated the details of the assistance. During this phase, 18 of India's premier milk sheds were linked with consumers in four cities, i.e. Delhi, Mumbai, Kolkata and Chennai.
2. **Phase II (1981-85)** increased the milk sheds from 18 to 136. Around 290 urban markets expanded the milk outlets. A self-sustaining system of 43,000 village cooperatives covering around 4.25 million milk producers became a reality by the end of 1985. At the domestic level, the production of milk powder increased from 22,000 tons in the pre-project year to 140,000 tons by 1989. Producers' cooperatives were able to increase direct marketing of milk by several million litres per day.
3. **Phase III (1985-1996)** enabled dairy cooperatives to expand and strengthen the infrastructure necessary for the procurement and marketing of increasing volumes of milk. The phase is also characterised by the extension of veterinary first-aid health care services, feed and artificial insemination services and intensified education for cooperative members. There was an increased emphasis on research and development in animal health and animal nutrition, leading to innovations like vaccine for Theileriosis, bypass protein feed and urea-molasses mineral blocks, all of which contribute to the enhanced productivity

³ *Operation Flood*. [online] Available at: <<https://www.nddb.coop/about/genesis/flood>> [Accessed 13 July 2022].

of milch animals. This phase consolidated India's dairy cooperative movement, adding 30,000 new dairy cooperatives to the existing 42,000. Milk sheds peaked to 173 in 1988-89. Notably, the numbers of women members and Women's Dairy Cooperative Societies increased significantly during this phase.

Operation Flood was not just a dairy programme, but also an instrument of development, generating employment and regular incomes for millions of rural people. Interestingly, the 1997 Report of the World Bank states that Operation Flood can be seen as a 20-year experiment confirming the Rural Development Vision.

THE RIGHT TO FOOD- RIGHT TO MILK

The Right to Food is a basic human right closely connected to the right to life and the right to health. Without adequate food, people cannot lead healthy lives, as a consequence of which they are unemployable. This in turn means that child care and education gets compromised.

Art. 25 of the Universal Declaration of Human Rights, 1948 recognizes the right to Food as part of the Right to an adequate standard of living. Further, Art. 11(1) of the International Covenant on Economic, Social and Cultural Rights recognizes the Right to Adequate Food as an integral component of the right to an adequate standard of living. Art. 11(2) recognizes the right of everyone to be free from hunger. Thus, the right to food consists of two main components⁴:

- The right to adequate food
- The Fundamental right to be free from hunger

In India, although the Constitution does not explicitly provide for the Right to Food, the Supreme Court has interpreted the right under the ambit of Art. 21 Right to Life.

In *Shantisar Builders v Narayanan Khimala Totame*⁵, *Dena Nath vs. National Fertilizers Ltd.*⁶, *Kapila Hingorani vs. State of Bihar*⁷, and *Peerless General Finance and Investment Co. Ltd. vs. Reserve Bank of India*⁸, the Supreme Court recognised the constitutional obligations of the Government to ensure to all a life of dignity, with adequate food.

In the case of *PUCL vs. Union of India*⁹, the Court held that the right to food is a fundamental right of all citizens. The Supreme Court recognized the duty of every State and Union Territory to ensure that no one dies from starvation or malnutrition. The Court directed States to ensure effective functioning of shops linked to the Public Distribution System and ordered them to implement food-

⁴ Fao.org. 2022. *Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security*. [online] Available at: <<https://www.fao.org/3/y7937e/Y7937E.pdf>> [Accessed 12 July 2022].

⁵ *Shantisar Builders v. Narayanan Khimala Totame* (1990) 1SCC 520.

⁶ *Dena Nath v. National Fertilizers Ltd.* (1992) 1SCC 695.

⁷ *Kapila Hingorani v. State of Bihar* (2003) 6 SCC 1.

⁸ *Peerless General Finance and Investment Co. Ltd. v. Reserve Bank of India* (1992) 2 SCC 343.

⁹ *People's Union for Civil Liberties v. Union of India & Ors*, AIR 2003 SC 2363.

for-work programmes such as the Mid-Day Meal Scheme and the ICDS within a definite time-frame.

In another PIL contending violation of Articles 21 and 47¹⁰, the Court ordered that in order to prevent Hunger and starvation, the country's food stocks must be utilized without any delay. The Court took into consideration the ICDS (Integrated Child Development Scheme) that intends to provide supplementary food to children in the age group of 0–6 years and to pregnant woman and observed that to ensure that nutritious food reaches the undernourished or malnourished or other beneficiaries under the scheme, a lot more needs to be done. The Court directed the Anganwadi Centres, which are the implementing agencies for the ICDS to supply nutritious food/supplement to the children, adolescent girls and pregnant and lactating women for 300 days in a year.

Milk is the first food for humans. It is rich in nutritional elements that are necessary for the growth and maintenance of the human body, in adequate amounts.¹¹ It has a major role to play in building and maintaining bone and teeth. It is also known to maintain good cardiac health, keep diabetes in check, aid in growth, boost immunity, and protect eyesight. It is an essential part of diet in any Society.

Breaking down the Nutritional Elements in a Cup of Milk:

Nutrients	Low-Fat Milk	Fat-Free Milk	Full-Fat Milk
Calories	102	86	146
Fats	2mg	0mg	8 mg
Cholesterol	12mg	5mg	24mg
Sodium	107mg	128mg	98mg
Carbohydrates	13mg	12mg	13mg
Sugar	13mg	12mg	13mg
Proteins	8mg	8mg	8mg
Dietary	0mg	0mg	0mg

The table¹² below lists the daily needs of Calcium and Vitamin D for all age groups. This table is proof enough that milk and other dairy products form an integral component of what would

¹⁰ PUCL v. UOI (SC 2001) Writ Petition No. 196/2001.

¹¹ *Nutritional Value of Milk*. [online] Available at: <<https://www.moh.gov.sa/en/HealthAwareness/EducationalContent/Food-and-Nutrition/Pages/milk.aspx>> [Accessed 12 July 2022].

¹² Ibid 11.

constitute adequate food. Thus, a notional extension of the right to adequate food would mean the right to milk and other dairy products, particularly in the growing years.

Daily Needs of Calcium and Vitamin D for all the Age Groups:

Age Group	Calcium Need Milligram/Day	Vitamin "D" Need Microgram/ Day	Daily Milk Amount
Birth- Six months	200	10	800-1200 mil/Daily
Six Months- Year	260	10	800-1200 mil/Daily
1-3 years	700	15	Two Cups
4-8 years	1000	15	Three Cups
9-18 years	1300	15	Three Cups
19-50 years	1000	15	Two Cups
51-70- years (Women)	1200	15	Three Cups

LEGISLATIONS

1) National Food Security Act, 2013

The National Food Security Act was passed by the Parliament of India on 10th September, 2013¹³. The Legislation aims to provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity. Section 5¹⁴ of the NFSA provides for Nutritional support to children. In order to meet the nutritional standards specified in Schedule II of the NFSA, 2013:

- (a) children in the age group of 6 months to 6 years are entitled to age appropriate meal, free of charge, through the local anganwadi. The proviso states that for children below the age of 6 months, exclusive breast feeding must be promoted.
- (b) children, up to class VIII or within the age group of 6 to 14 years, as applicable 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.

It is pertinent to note that an age- appropriate meal would definitely include dairy products, especially in light of the qualifying objective of meeting nutritional standards listed below. It is pertinent to note the protein requirements under Schedule II. Milk is a major source of high-quality proteins. Casein and whey protein are the major proteins of milk¹⁵ which constitute approximately

¹³ Dfpd.gov.in. 2022. *National Food Security Act (NFSA)*. [online] Available at: <<https://dfpd.gov.in/nfsa.htm#:~:text=As%20passed%20by%20the%20Parliament,to%20live%20a%20life%20with>> [Accessed 12 July 2022].

¹⁴ Section 5, The National Food Security Act, 2013.

¹⁵ Davoodi, S., Shahbazi, R., Esmacili, S., Sohrabvandi, S., Mortazavian, A., Jazayeri, S. and Taslimi, A., 2022. *Health-Related Aspects of Milk Proteins*. [online] PubMed Central (PMC). Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149046/>> [Accessed 12 July 2022].

80% (29.5 g/L) and 20% (6.3 g/L) of the total protein in bovine milk. 100g of milk is said to consist of 3.4g of Protein. Thus, it would not be far-fetched to conclude that an age-appropriate meal would include dairy products.

SCHEDULE II

[See sections 4(a), 5(I) and 6]

NUTRITIONAL STANDARDS

Nutritional standards: The nutritional standards for children in the age group of 6 months to 3 years, age group of 3 to 6 years and pregnant women and lactating mothers required to be met by providing "Take Home Rations" or nutritious hot cooked meal in accordance with the Integrated Child Development Services Scheme and nutritional standards for children in lower and upper primary classes under the Mid Day Meal Scheme are as follows:

Serial number	Category	Type of meal ^F	Calories (Kcal)	Protein (g)
1	2	3	4	5
1.	Children (6 months to 3 years)	Take Home Ration	500	12-15
2.	Children (3 to 6 years)	Morning Snack and Hot Cooked Meal	500	12-15
3.	Children (6 months to 6 years) who are malnourished	Take Home Ration	800	20-25
4.	Lower primary classes	Hot Cooked Meal	450	12
5.	Upper primary classes	Hot Cooked Meal	700	20
6.	Pregnant women and Lactating mothers	Take Home Ration	600	18-20

Further, under Section 6¹⁶, the State Government is mandated to through the local anganwadi, identify and provide meals, free of charge, to children who suffer from malnutrition. This is done in order to meet the nutritional standards specified in Schedule II of the NFSA, 2013.

POLICIES

In 1991, post the Operation Flood reforms, the dairy sector allowed private sector players to own the market including General Foods Nestlé and GlaxoSmithKline.

This gave way to multiple milk-producing and marketing businesses which crossed the Amul Model. However, the milk cooperative Societies rigorously opposed the imports from foreign countries which have highly mechanized milk-production under the Ongoing Regional Comprehensive Economic Partnership Arrangement¹⁷.

¹⁶ Section 6, The National Food Security Act, 2013.

¹⁷ Kathmandupost.com. 2022. *Opinion | A milk revolution in India, the Kurien way*. [online] Available at: <<https://kathmandupost.com/16/2019/09/25/a-milk-revolution-in-india-the-kurien-way>> [Accessed 12 July 2022].

Several schemes and policies have emerged ever since to ensure the strengthening of the milk Societies and Unions.

National Programme for Bovine Breeding and Dairy Development (NPBBDD)

The National Programme for Bovine Breeding and Dairy Development (NPBBDD), was initiated in February 2014 by merging four schemes that were functioning namely:

1. Department of Animal Husbandry
2. Dairying and Fisheries in the dairy sector, viz., National Project for Cattle and Buffalo Breeding (NPCBB)
3. Intensive Dairy Development Programme (IDDP)
4. Strengthening Infrastructure for Quality & Clean Milk Production (SIQ & CMP) and Assistance to Cooperatives (A-C)

The merger of schemes was to achieve higher milk production in the country with the utilization of scientific and holistic methods of production to meet the growing demands for milk in India. The scheme essentially has 2 Components namely:

- a. National Programme for Bovine Breeding (NPBB)
- b. National Programme for Dairy Development (NPDD)

The major Objectives of this Scheme are:

1. Allowing farmers to access Quality Artificial Insemination services at their Doorstep.
2. To bring breedable females under structured breeding through Artificial Insemination or Germplasm.
3. To conserve, develop and proliferate selected indigenous bovine breeds of high socio-economic importance.
4. To provide quality breeding inputs in breeding tracts of important indigenous breeds to prevent the breeds from deterioration and extinction.

National Programme for Dairy Development

"National Programme for Dairy Development "under the umbrella scheme "Development Programmes" was allocated of Rs. 340.01 crores for the year 2022- 23.

The National Programme for Dairy Development aims to improve the quality of milk and its products and to increase the share of organized procurement, processing, value addition and marketing.

The scheme has two components, namely,

1. Component 'A'- improvement in infrastructure to ensure quality milk testing equipment and chilling facilities for federations and Unions in the State.
2. Component 'B'- financial assistance from Japan International Cooperation Agency (JICA).

The Central Government's share in this project is proposed to be funded through NPDD.

The scheme is implemented through a central level Committee (CPSC - Central Project Steering Committee) which is headed by the Secretary - GOI, which will further provide policies, recheck the fund requirements, and consider the eligibility conditions and terms of the agreements between

stakeholders. The sanctioning Committee (PSC - project Sanctioning Committee) is to monitor costs.

At the State Level, there is another Committee (SLTMC- State Level Technical Management Committee) which looks into the projects within the State¹⁸.

Nutrition advanced by the NDDB

The NDDB (National Dairy Development Board) has promoted and encouraged NDDB Foundation for Nutrition (NFN) and its subsidiaries which include:

- Indian Immunological Limited
- IDMC Limited (Indian Dairy Machinery Company Ltd, Anand (IDMC))
- Mother Dairy Fruits and Vegetables Private Limited
- Gujarat Cooperative Milk Marketing Federation (GCMMF)

NFN was registered in 2015 at Anand, Gujarat as a Society under the Societies Registration Act, 1860 and as a Trust. The mission of NFN is to strive toward the eradication of malnutrition in school children by enabling them to consume safe milk and milk products. The major objectives are:

- To provide nutritional support to children through nutritious products to eradicate malnutrition.
- To promote the consumption of milk and milk products including fortified milk and milk products.

Working of NFN

The NDDB, along with the various milk cooperatives has set up foundations to facilitate free milk supply to underprivileged children encouraging the corporates to perform their corporate social responsibility (CSR) for this. It is creating a large network of about 220 Milk Unions, 31 Marketing Diaries and around 1.94 Lakh Dairy Cooperative Societies across India. It also ensures supply, logistics and monitoring by leveraging the expertise of NDDB¹⁹.

The GIFT MILK Programme

The Gift milk programme is the first initiative of the NFN. The target group is mainly children aged 5 to 15 years in primary and upper primary classes from government schools or schools run for underprivileged children by NGOs and other charitable organizations.

Milk and Nutrition

¹⁸F. No.4-912021-DP (E-19690) Government of India Ministry of Fisheries, Animal Husbandry and Dairying Department of Animal Husbandry and Dairying, NPDD, 2021.

¹⁹(Nfn.org.in. 2022. *About Gift Milk | NDDB Foundation for Nutrition*. [online] Available at: <<https://www.nfn.org.in/our-programmes/about-gift-milk>> [Accessed 12 July 2022].)

As per an FAO²⁰, animal source food has the essential nutrients needed for supporting growth. There are several scientific studies on how milk and nutrition are interlinked. The meta-analysis conducted conclude that supplementing a child's diet with milk shows an additional growth of 0.4cm per year for every 245 ml of milk when added to the diet.

Milk is an essential source of Vitamin B12, which is often seen to be deficient in persons who consume very little animal-rich food sources. Milk can be used as a fortification vehicle for micronutrients²¹. Inclusion of milk in an undernourished child's daily diet will ensure linear growth in the child and enable weight gain amongst children aged six months to five years, suffering from moderate malnutrition²². In children with poor nutritional status, the addition of milk to the diet is likely to supply nutrients that are important for growth and are deficient in the diet²³.

POSHAN ABHIYAAN and The Role of Milk in states like Bihar and Odisha

In 2017, India launched the POSHAN ABHIYAAN, a national nutrition mission to improve the nutritional level of children, pregnant women and lactating mothers.

Bihar

During the Pandemic, migrant workers were enrolled in Anganwadi centres and were provided with milk and eggs from State Funds. The CNNS (Comprehensive National Nutrition Survey, April to June 2020) showed a decrease in stunting and wasting in Bihar as compared to the NFHS 4. (National Family Health Survey, 4th Series, 2015-16)

Odisha

A study on household-level food and nutrition insecurity and its determinants in Eastern India suggested that the lack of food and nutrition security could obstruct development in the region. It noted the lack of milk in the dietary consumption of those living there²⁴.

National Dairy Plan Phase 1

The NDP I is a Central Scheme which started in the year 2011. The Objectives were designed in a way which enabled the development of the project by aiding and increasing the productivity of

²⁰ Milk and Dairy Products in Human Nutrition, Food and Agriculture Organization of the United Nations, 2013.

²¹ 2022. *The Need* | *NDDB Foundation for Nutrition*. [online] Available at: <<https://www.nfn.org.in/need>> [Accessed 12 July 2022].

²² *Moderate acute malnutrition (MAM)*, defined as weight-for-height₁ z-score (WHZ) between -2 and -3 or mid-upper arm circumference (MUAC) between 115 millimeters and <125 millimeters)-(WHO (World Health Organization). 2012. "Supplementary Foods for the Management of Moderate Acute Malnutrition in Infants and Children 6–59 Months of Age." Technical Note, WHO, Geneva.

²³ Hoppe C, Mølgaard C, Michaelsen KF. Cow's milk and linear growth in industrialized and developing countries. *Annu Rev Nutr.* 2006;26:131-73. doi: 10.1146/annurev.nutr.26.010506.103757. Erratum in: *Annu Rev Nutr.* 2007;27:ix. PMID: 16848703.

²⁴ Parappurathu, Shinoj, Anjani Kumar, M. C. S. Bantilan, and Pramod Kumar Joshi. "Household-level food and nutrition insecurity and its determinants in eastern India." *Current Science* 117, no. 1 (2019): 71-79.

milch animals to increase milk production to meet the surging demands for milk. Along with this, it aimed to ensure that the rural milk producers have better access to the organized milk-processing sector. The project looked at development in almost all states accounting for over 90% of the country's milk production.²⁵

The NDP Phase I was implemented last on the 29th of November, 2019 as per the Closure of Project Date of the World Bank and its financial closure was in the month of March, 2020²⁶. The activity-wise physical progress is provided below²⁷:

Annexure II: Physical Progress				
Indicators	Unit of Measure	Baseline (2012)	Cumulative	
			EoP Target as per PIP	EoP Actual
PDO level indicators				
Milk production/animal	Liters/day	5.03	5.53	5.80
Proportion of "in-milk" female animals to adult female animals	%	63	66	67
Proportion of total milk sold to total production	%	65	65	66
Share of milk sold to the organized sector (as a share of production)	%	45	56	59
Intermediate Result Indicators				
Number of genetically improved bulls produced through progeny testing program*	Numbers	25	2025	2185
Number of genetically improved bulls produced through pedigree selection**	Numbers	0	500	271
Number of semen doses produced	All India Million Doses (Annual-2018-19)	56	100	119.07
Number of villages covered by AI	Numbers	0	24000	12322
Number of AIs done annually during 2018-19	Million	0.00	3.82	0.78
AI Conception Rate	%	30	45	44
Villages covered und. Compoer RBP	Numbers	400	40000	33374
Animals covered by RBP	Lakh	0.1	27	28.65
Per cent reduction in cost of feeding per Kg of milk for animals covered by RBP	%	0	7	Coop:11.8 PC: 8.29

²⁵ National Dairy Plan Phase I, 2011-12 to 2017-18.

²⁶ F. No.22-2312011-DP Government of India Ministry of ft {Agriculture Department of Animal Husbandry, Dairying & Fisheries, National Dairy Plan Phase I, 2011-12 to 2017-18.

²⁷ Nddb.coop. 2022. *Achievements | NDPI*. [online] Available at: <<https://www.nddb.coop/ndpi/about/achievements>> [Accessed 12 July 2022].

Number of trained mobile AI technicians (MAITS) in the project	Number	0	3000	1330
Number of trained Local Resource Persons (LRPs) in the project	Number	400	40000	31148
% reduction in methane release per kilogram of milk produced by animals covered under RBP	%	0	10	13.3
Number of additional milk producers organized or enrolled into dairy coop societies (DCS)	Total (Lakh)	0	12	16.88
	of which female (Lakh)	0	3	7.64
	of which Small holders (Lakh)	0	9	11.35
Additional number of villages covered or strengthened for milk collection	Numbers	0	31900	52509

From the above data, there is growth in the number of additional milk producers organized or enrolled on dairy cooperative societies (DCS) which is 0 in the base year 2012 and shows a tremendous increase in numbers in the cumulative years to 16.88 Lakhs. Further, the additional number of villages which were covered under the Plan for milk collection also showed a significant increase from 0 in the base year to 52509 villages.

Rashtriya Gokul Mission²⁸

- To improve breeding and undertake programmes for indigenous cattle breeds specifically focusing on improving the genetic makeup and stock surge.
- To increase the production of milk and the fecundity of indigenous bovines.
- To enhance and upgrade nondescript animals with the aid of better breeds (indigenous). For instance: Gir, Sahiwal, Red Sindhi, Deoni, Rathi and Tharparkar.
- To ensure that the genetic merit bulls are disease free and are distributed to be used for natural services.

Under the revised Nutritional and Feeding norms which have been made effective from February 2009, State Governments and UTs have been requested to provide 300 days of supplementary food to the beneficiaries in a year which would entail giving more than one meal to the children from 3-6 years who visit AWCs.²⁹ This includes morning snacks in the form of milk (micronutrient fortified food).³⁰

Several states have undertaken an initiative to eradicate malnutrition through the supply of milk at Anganwadi centres. Milk is provided for 3 days a week in the 3 to 6 age group by the Madhya Pradesh Mid-Day Meal Programme Council (Panchayat and Rural Development Department) from January-2021.³¹

²⁸ Pib.gov.in. 2022. *Rashtriya Gokul Mission Aims to Conserve and Develop Indigenous Breeds*. [online] Available at: <<https://pib.gov.in/newsite/PrintRelease.aspx?relid=107580>> [Accessed 12 July 2022].

²⁹ Anganwadi Centres.

³⁰ Revised Nutrition and Feeding Norms under Supplementary Nutrition Component of ICDS (revised w.e.f 24 February 2009).

³¹ The New Indian Express. 2022. *Milk to be served three days a week to children aged between 3 and 6 years at Anganwadis in MP*. [online] Available at: <<https://www.newindianexpress.com/nation/2021/mar/17/milk-to-be->

MAAY - relaunched

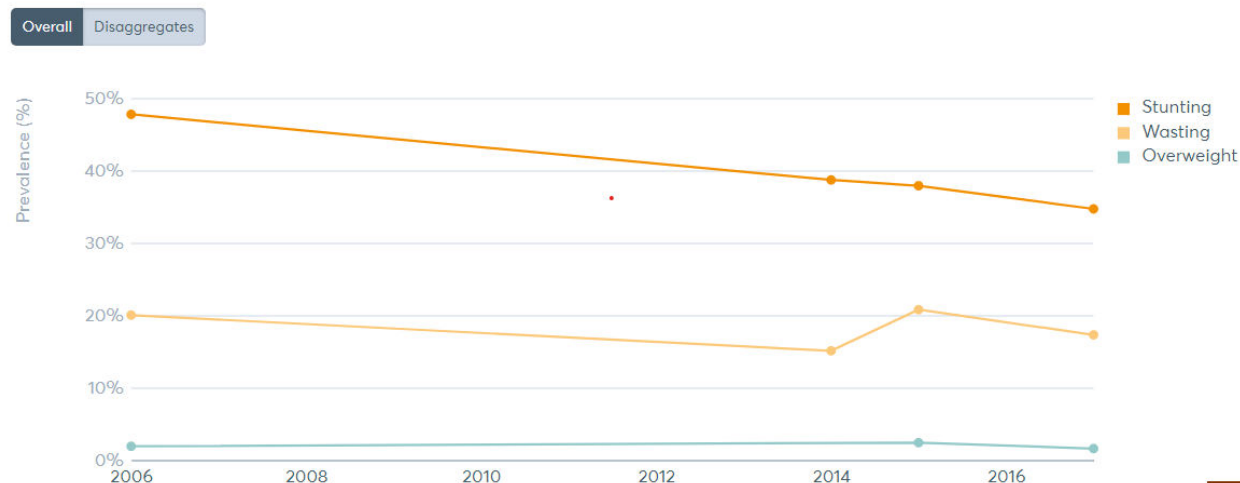
Further, in 2021 Mr. Pushkar Singh Dhami, Chief Minister of Uttarakhand re-launched the Mukhyamantri Anchal Amrit Yojana (MAAY). The scheme was initiated in 2019 but ended abruptly due to the pandemic. Under the scheme, milk was provided to the Anganwadi centres four times a week. Several attempts to include the consumption of Milk in the mid-day meal scheme have also been made.³²

CURRENT STATUS IN INDIA

The 2021 Global Nutrition Report³³ gives us some concern worthy statistics on malnutrition in India. A common cause of malnutrition is suboptimal diet. Although India is the largest producer of milk³⁴ globally, those belonging to the lower income groups cannot afford milk. An intervention that has been employed to tide over this situation is inclusion of milk in the feeding programmes in schools.

Infant and young child nutrition status

Prevalence of stunting, wasting and overweight in children under 5 years of age



The NDDDB Foundation for Nutrition, established by the National Dairy Development Board, has been facilitating the distribution of fortified flavoured milk to children in certain government

served-three-days-a-week-to-children-aged-between-3-and-6-years-at-anganwadis-in-mp-2277496.html> [Accessed 12 July 2022].

³² Paper, T., Editor, R., Page, O., 2022, B., Quotes, S., Sports, O., gardens, H. and scheme, V., 2022. *Vice-President Venkaiah Naidu suggests milk be made part of mid-day meal scheme*. [online] Thehindu.com. Available at: <<https://www.thehindu.com/news/national/vice-president-venkaiah-naidu-suggests-milk-be-made-part-of-mid-day-meal-scheme/article32543906.ece>> [Accessed 12 July 2022].

³³Globalnutritionreport.org. 2022. *Country Nutrition Profiles*. [online] Available at: <<https://globalnutritionreport.org/resources/nutrition-profiles/asia/southern-asia/india/>> [Accessed 12 July 2022].

³⁴ Venkata Harinarayan, C., Akhila, H. and Shanthisree, E., 2021. *Modern India and Dietary Calcium Deficiency—Half a Century Nutrition Data—Retrospect—Introspect and the Road Ahead*. [online] Available at: <<https://www.frontiersin.org/articles/10.3389/fendo.2021.583654/full>> [Accessed 12 July 2022].

schools under the Giftmilk scheme³⁵³⁶. As of March 2019, the NFN had distributed 60 lakh units of milk to approximately 44,000 school children in 94 schools in 7 states of the country. The Rajendra Institute of Medical Sciences, Ranchi, conducted a study to understand the impact of Giftmilk on children in schools of Latehar district of Jharkhand, where the scheme was operational since November 2017. Some promising findings of the study are as follows:

- Consumption of milk helped children fight infections.
- 7% decrease in the number of stunted children.
- Children in intervention schools had better BMI for their age and sex compared to non-intervention schools, thus showing better nourishment.
- Reduction in visual impairment among children.
- Reduction in the number of anaemic children after regular consumption of milk
- Improvement in IQ levels
- Increase in cumulative attendance by more than 10%

Such schemes are being implemented by the states of Gujarat, Karnataka, Rajasthan, and Madhya Pradesh by providing powder-based milk to children. This has however been subject to criticism on account on quality variations, safety issues and leakages/misuse of resources.

1. In 2013, the Government of Karnataka started the “Ksheerabhagya Yojane” scheme effective from 1st Aug 2013 under the aegis of the Departments of Education, Women and Child welfare and Karnataka Milk Federation. Under the scheme, all children studying from 1st to 10th standard in government and government aided schools, and all Anganwadi children from 6 months to 6 years were to be given, 3 days in a week on alternate days, 150ml of milk for each child, prepared from Milk Powder³⁷. In 2015, the government proposed to extend the scheme to all five days a week³⁸. During the pandemic, the free distribution of milk power was dropped citing logistical challenges posed by the lockdown. In 2021, the Government temporarily resumed the distribution after the State Women and Child Development Minister Shashikala Jolle reviewed the child nutrition programme and

³⁵ Financialexpress.com. 2022. *How milk can address malnutrition in children | The Financial Express*. [online] Available at: <<https://www.financialexpress.com/opinion/how-milk-can-address-malnutrition-in-children/1577205/>> [Accessed 12 July 2022].

³⁶ Rath, D., 2019. *Milky Matters: Addressing malnutrition through school milk programme, writes NDDB Chairman Dilip Rath*. [online] Free Press Journal. Available at: <<https://www.freepressjournal.in/food/milky-matters-addressing-malnutrition-through-school-milk-programme-writes-nddb-chairman-dilip-rath>> [Accessed 12 July 2022].

³⁷ Kmea.karnataka.gov.in. 2013. *Terms of Reference for Evaluation of Ksheerbhagya Scheme of Government of Karnataka implemented through Education and Women and Child Welfare departments and Karnataka Milk Federation from 01st Aug-2013*. [online] Available at: <<https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Ksheera%20Bhagya%20ToR.pdf>> [Accessed 12 July 2022].

³⁸ Gatty, H., 2015. *Karnataka govt proposes free milk in schools for five days a week*. [online] The Indian Express. Available at: <<https://indianexpress.com/article/india/india-others/karnataka-govt-proposes-free-milk-in-schools-for-five-days-a-week/>> [Accessed 12 July 2022].

pointed out that around 4.47 lakh children were malnourished in the state and among these, 7,751 children were severely malnourished³⁹.

2. In July 2018, the state government of Maharashtra had announced the inclusion of milk or milk powder in the school nutrition scheme. Subsequently, a Government Resolution (GR) was issued by the School Education and Sports department to provide 600 grams of skimmed milk powder as health supplement to each primary school student for 3 months as part of a pilot project. As per the Economic Survey of Maharashtra for 2017-18, the scheme was set to benefit 1.18 crore students studying in 1,06,527 primary schools (class 1-8)⁴⁰. Schools were to distribute the skim milk powder packets to the students on a designated 'skim milk powder distribution day' in the presence of the school management committee. Schools were also expected to teach parents of the students how to reconstitute milk from the powder⁴¹. In 2020, the Giftmilk scheme was launched to cover around 4,000 students of 26 government schools in Gadchiroli district. This was funded by NBCC India Ltd. and NBCC Services Ltd. under their CSR allocation. Under the scheme, the Bhandara Milk Union provided 200 ml fortified flavoured pasteurized toned milk to every child every day on all school working days⁴².
3. In the state of New Delhi, as early as in 1959, the Delhi Milk Scheme (DMS) was set up with the primary objective of supplying wholesome milk to citizens at reasonable prices and to provide remunerative prices to milk producers⁴³. In 2017, 'Vatsalya - Maatri Amrit Kosh', a National Human Milk Bank and Lactation Counselling Centre was established at the Lady Harding Medical College in New Delhi in collaboration with the Norwegian government, Oslo University and Norway India Partnership Initiative (NIPI). Expected to be the largest public sector Human Milk Bank and Lactation Counselling Centre in North

³⁹ The News Minute. 2021. *Karnataka govt temporarily restarts free milk distribution to school children*. [online] Available at: <[⁴⁰ India Today. 2018. *To boost nutrition, Maharashtra govt to provide skimmed milk powder to primary school students*. \[online\] Available at: <<https://www.indiatoday.in/education-today/news/story/maharashtra-govt-skimmed-milk-powder-primary-kids-1322897-2018-08-25>> \[Accessed 12 July 2022\].](https://www.thenewsminute.com/article/karnataka-govt-temporarily-restarts-free-milk-distribution-school-children-150967#:~:text=%E2%80%9CEach%20school%20student%20from%20class,lockdown%20imposed%20in%20Mar%202020.> [Accessed 12 July 2022].</p>
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⁴¹ Free Press Journal. 2019. *Maharashtra state to provide skim milk powder to primary school students*. [online] Available at: <<https://www.freepressjournal.in/cmcm/maharashtra-state-to-provide-skim-milk-powder-to-primary-school-students>> [Accessed 12 July 2022].

⁴² The Live Nagpur. 2020. *NFN's Giftmilk programme launched for 4,000 students of government schools in Gadchiroli district of Maharashtra - The Live Nagpur*. [online] Available at: <<https://thelivenagpur.com/2020/02/28/nfns-giftmilk-programme-launched-for-4000-students-of-government-schools-in-gadchiroli-district-of-maharashtra/>> [Accessed 12 July 2022].

⁴³ 1959. *Delhi Milk Scheme*. [online] Available at: <[https://www.msmekipathshala.com/webkype/assets/pdf/Ministry%20of%20Fisheries,%20Animal%20Husbandry%20and%20Dairying/NATIONAL%20PROGRAMME%20FOR%20DAIRY%20DEVELOPMENT/Delhi%20Milk%20Scheme%20\(DMS\).pdf](https://www.msmekipathshala.com/webkype/assets/pdf/Ministry%20of%20Fisheries,%20Animal%20Husbandry%20and%20Dairying/NATIONAL%20PROGRAMME%20FOR%20DAIRY%20DEVELOPMENT/Delhi%20Milk%20Scheme%20(DMS).pdf)> [Accessed 12 July 2022].

India⁴⁴, the milk bank collects, pasteurizes, tests and stores milk donated by lactating mothers and makes it available for the infants in need. The project also acts as the teaching, training and demonstration site for other milk banks to be established under the Ministry of Health and Family Welfare, Government of India.

4. In 2006-07, the Gujarat Tribal Development Department launched the Doodh Sanjeevani Yojana in partnership with the district level co-operative diaries to improve the health of children in tribal talukas and improve and enrich the level of nutrition of primary school going tribal students. The intended beneficiaries of the scheme are Schedule Tribe students of primary schools and Ashramshalas. Under the scheme, students get 200 ml of fortified milk with added protein 7 gm., 24 gm. Carbohydrate, 3% fat, vitamin A 500 I.U., vitamin D 40 I.U. milk in school every day. In the year 2019-20, a total of 7,68,465 children from 8958 schools of 52 talukas of 14 districts received benefits under this scheme⁴⁵.
5. The state of Uttar Pradesh has implemented Uttar Pradesh Milk Policy, 2018, the objectives of which are to promote Dairy units and attract investments in UP, diversify rural livelihood and ensure fair prices to farmers, increase milk production in UP at affordable rates, and to promote innovations, R&D and Tech advancement⁴⁶. In 2021, the state set a record in the dairy sector, securing the first position in milk production in the country⁴⁷. However, in 2019, a video of a cook of the government's mid-day meal programme mixing a packet of one-litre milk with a bucket of water to feed around 81 students at a local school in Sonbhadra district had surfaced, causing a great deal of concern. It was also pointed out in the Lok Sabha by the Human Resource Development Minister Mr. Ramesh Pokhriyal Nishank that the highest number of complaints over the mid-day meal came from Uttar Pradesh⁴⁸.
6. In 2021, the Mid- Day meal scheme was temporarily restructured in the state of Kerala. Due to the reason that teachers were struggling to meet the expenses of buying the food items due to price hike, the General Education Department decided that eggs and milk should be provided once a week until normal functioning of schools resumed. Earlier, milk

⁴⁴ India Today. 2017. *National human milk bank opens at Lady Hardinge Medical College in Delhi*. [online] Available at: <<https://www.indiatoday.in/education-today/gk-current-affairs/story/national-human-milk-bank-delhi-982775-2017-06-14>> [Accessed 12 July 2022].

⁴⁵ Tribal Development Department- Government of Gujarat. *Doodh Sanjeevani Yojana*. [online] Available at: <<https://tribal.gujarat.gov.in/doodh-sanjeevani-yojana>> [Accessed 12 July 2022].

⁴⁶ Invest.up.gov.in. 2018. *Uttar Pradesh Milk Policy 2018 | Official Website of Invest UP, Government of Uttar Pradesh, India*. [online] Available at: <<https://invest.up.gov.in/up-milk-policy-2018/>> [Accessed 12 July 2022].

⁴⁷ Bureau, A., 2021. *Uttar Pradesh Sets Record in Dairy Sector, Contributed Highest in India's Milk Production*. [online] Available at: <<https://news.abplive.com/states/up-uk/uttar-pradesh-sets-record-in-dairy-sector-contributed-highest-in-india-s-milk-production-rt-1478048>> [Accessed 12 July 2022].

⁴⁸ Pandey, A., 2019. *1 Litre Milk Diluted with Water Served to 81 Students in UP School*. [online] NDTV.com. Available at: <<https://www.ndtv.com/india-news/mid-day-meal-1-litre-milk-diluted-with-water-served-to-81-students-in-uttar-pradesh-school-2140490>> [Accessed 13 July 2022].

(150 ml) was given twice a week and eggs once a week as supplementary nutrition. Banana was given to the children who do not consume eggs⁴⁹.

7. In July 2022, the Gift Milk' programme was launched in government schools in Odisha. The initiative is set to be rolled out on a pilot basis for a month and is expected to benefit around 3,162 students in 21 government schools in Swabhiman Anchal of Chitrakonda and the inaccessible pockets of Mathili, Korukonda and Podia blocks⁵⁰. It is supported by the NDDDB Foundation for Nutrition with the CSR assistance of Indian Railway Construction Ltd.
8. The Tribal Affairs Department in Jammu and Kashmir rolled out a plan for the establishment of Milk Villages, Milk Chilling plants (MCP), Milk Product Processing and other facilities in tribal villages to support milk production and supply chain in these areas⁵¹. In Phase- I, 16 villages have been taken up for the establishment of Milk Villages while 2 ongoing projects are on the road to completion. All the Milk Villages approved by the Department are being established with 100% Government funding. The department is also coordinating with financial institutions for the establishment of 100 Milk Villages and Chilling Plants under the Public-Private Partnership model. Earlier, a common concern for hundreds of dairy farmers was the faltering marketing chain due to which they were compelled to throw away thousands of litres of milk in Kashmir. The JKMPCL was then roped in to make these units operational so that at least one BMC per block is made operational⁵². In a 2021 conference organized by the Department of Animal Husbandry, Jammu on Feed and Fodder Management for increasing milk production, Principal Secretary Department of Agriculture Production & Farmer's Welfare and Animal and Sheep Husbandry Department, Mr. Navin Kumar Choudhary credited the increase in milk production to the Integrated Dairy Development Scheme (IDDS). He also stated that J&K was exporting milk to neighbouring states like Punjab, reaffirming that Jammu and Kashmir is fast becoming self-sufficient in milk⁵³. In 2022, it was reported that the JKMPCL is working to raise milk production to 3 lakh litres a day through several schemes

⁴⁹ English.Mathrubhumi. 2021. *Mid-day meal scheme restructured; milk only once a week*. [online] Available at: <<https://english.mathrubhumi.com/news/kerala/keralamiddaymealfund-1.6269095>> [Accessed 12 July 2022].

⁵⁰ The New Indian Express. 2022. *'Gift Milk' programme aiming to address malnutrition launched in government schools in Odisha*. [online] Available at: <<https://www.newindianexpress.com/states/odisha/2022/jul/11/gift-milk-programme-aiming-to-address-malnutrition-launched-in-government-schools-in-odisha-2475241.html>> [Accessed 12 July 2022].

⁵¹ Greater Kashmir. 2022. *Transforming J&K | 200 schools in tribal areas being converted to Smart Schools; 'Govt making continuous efforts for upliftment of tribal population'*. [online] Available at: <<https://www.greaterkashmir.com/todays-paper/state/transforming-jk-200-schools-in-tribal-areas-being-converted-to-smart-schools-govt-making-continuous-efforts-for-upliftment-of-tribal-population>> [Accessed 12 July 2022].

⁵² Tribuneindia News Service. 2022. *No milk buyers in Kashmir, white revolution takes a hit*. [online] Available at: <<https://www.tribuneindia.com/news/j-k/no-milk-buyers-in-kashmir-white-revolution-takes-a-hit-366297>> [Accessed 12 July 2022].

⁵³ Kashmir Observer. 2021. *J&K Fast Becoming Self-Sufficient in Milk Production: Govt*. [online] Available at: <<https://kashmirobsrver.net/2021/12/14/jk-fast-becoming-self-sufficient-in-milk-production-govt/>> [Accessed 12 July 2022].

including the Dairy entrepreneurship development scheme (DEDS), the main focus of which is to set up small dairy farms⁵⁴.

INTERNATIONAL PERSPECTIVE

The Questions and Answers on Milk and Dairy Products in Human Nutrition prepared by the Food and Agriculture Organization of the United Nations states that Governments, development agencies and the private sector all have roles to play in rebuilding links between dairy development and nutrition, calling for the development of a Nutrition-sensitive dairy-industry. It recognizes the role of governments in developing countries in the following areas⁵⁵:

- 1) Strong National Nutrition strategy which would provide the framework to add a dairy programme
 - Identification of national nutritional challenges,
 - Promoting measurement of nutritional status,
 - Providing dietary guidelines.
- 2) Providing policies, laws and regulations to support nutrition-sensitive dairy-industry development and the provision of safe milk and dairy products.
- 3) Investment or promotion of investment in basic infrastructure like roads, electricity and water supplies to address limitations to the practical scope of a dairy programme.
- 4) Promoting institutional collaborations between the government agencies. Example: Ministry responsible for livestock industry development and Ministry responsible for human health and social welfare.
- 5) Promoting both public and private sector investment in sustainable and inclusive dairy industry development programmes.

POLICY RECOMMENDATIONS

- While India's efforts are building links between dairy and nutrition have been significant, one area that needs work is that of institutional collaboration between government agencies. A multi-stakeholder perspective to the issues at hand will certainly bring forth more effective policy solutions. The Ministry of Fisheries, Animal Husbandry and Dairying, the Ministry of Health and Family Welfare, Ministry of Science and Technology, the Ministry of Education are some of the stakeholders that can add value to resolving the issues.
- A 2020 cross-sectional study titled, "*Milk consumption and childhood anthropometric failure in India: Analysis of a national survey*" conducted by Shelley M. Vanderhout and Daniel J. Corsi using the fourth Indian National Family Health Survey (NFHS-4),

⁵⁴ Desk, G., 2022. *JKMPCL working to raise milk production to 3 lakh litres a day: officials*. [online] Greater Kashmir. Available at: <<https://www.greaterkashmir.com/business/jkmpcl-working-to-raise-milk-production-to-3-lakh-litres-a-day-officials>> [Accessed 12 July 2022].

⁵⁵ Fao.org. n.d. *Milk and Dairy Products in Human Nutrition- Questions and Answers*. [online] Available at: <https://www.fao.org/fileadmin/user_upload/newsroom/docs/Milk%20and%20Dairy%20Q&A.pdf> [Accessed 12 July 2022].

identified that children aged 6–59 months who consumed milk had lower odds of stunting, underweight and anthropometric failure after adjustment for relevant covariates⁵⁶. Based on the Latehar model of the Giftmilk scheme, the Centre must consider announcing a policy and a centrally-sponsored scheme to initiate school milk programmes on a countrywide basis, based on Latehar model. With a vast network of dairy cooperatives and dairies across the country, implementation of the scheme will definitely be smooth. School milk programmes would certainly aid in addressing the issue of malnutrition.

- India needs to step up in adopting food fortification as a scalable public health intervention. A glass of fortified milk (320g) is said to provide approximately 34% of the recommended daily requirement of Vitamin A and 47% of Vitamin D. In 2016, the FSSAI released standards for the fortification of five staple food items including milk. Post this, regulations were made to fortify milk variants such as low fat, skimmed, and whole milk with Vitamin A and D. In 2017, the NDDDB partnered with the South Asia Food and Nutrition Security Initiative (SAFANSI), the World Bank, and The India Nutrition Initiative, Tata Trusts to venture into large-scale milk fortification⁵⁷. This collaboration enabled a pilot milk fortification for their consumers. However, milk fortification is not yet common practice across the Indian milk industry. Further, fortification standards need to be put in place for variants of milk such as cow milk and full cream milk.
- From the start of the White Revolution, the policy has been more production oriented. Although the average per capita milk consumption in India at 376g is more than the world's average of 313g, it still falls short of the OECD levels⁵⁸. Further, milk consumption is not homogeneous in the country. While providing supplementary nutrition through government schemes like Mid- Day Meal or Anganwadi Centers caters to the poor, it is not free from challenges. These challenges need to be addressed for which there is a need to strengthen milk marketing in second and third tier cities, especially in the northern and eastern parts of India where the cooperation movement in milk production has not taken off. A push for such a cooperative structure would increase the reach as well as increase the demand.

CONCLUSION

Amidst the growing movement for Veganism and the Protection of Animal Rights, one must not forget the manner in which economic forces operate. Cattle-rearing and the production of milk are one of the cheapest means of livelihood, especially in villages and farms. The dairy and animal

⁵⁶ Vanderhout, S. and Corsi, D., 2020. *Milk consumption and childhood anthropometric failure in India: Analysis of a national survey*. [online] National Library of Medicine. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7988841/>> [Accessed 12 July 2022].

⁵⁷ BRESNYAN, E. and RAJ N, G., 2018. *Milk fortification in India: The journey so far*. [online] World Bank Blogs. Available at: <<https://blogs.worldbank.org/endpovertyinsouthasia/milk-fortification-india-journey-so-far>> [Accessed 12 July 2022].

⁵⁸ Singh, M., 2018. *White Revolution 3.0? - The Economic Times*. [online] Available at: <https://m.economictimes.com/news/economy/agriculture/white-revolution-3-0/amp_articleshow/66794515.cms> [Accessed 13 July 2022].

husbandry sector's contribution to the Indian GDP is around 4.2%. It is a fundamental source of income for more than 7 crore rural families. Those involved in the milk production sectors are poor, small, landless and marginal farmers. The socio-economic circumstances of the vulnerable groups of people need to be taken into consideration. India became one of the largest producers of milk in a very short span of time. This highlights the importance of the dairy industry. Along with economic factors, milk and dairy products are of high nutritional value and have proved to be a boon to address malnourishment. It is rich in both proteins and fats. Several schemes have been introduced for the efficient production of milk. Numerous welfare schemes and policies are in place for ensuring better growth, especially through dairy products. The White Revolution has transformed lives for the better. Thus, it is of extreme importance to keep the movement alive meaningfully.