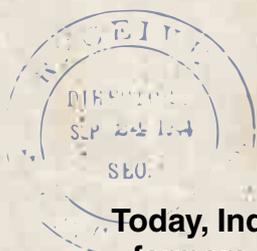


On the cover for this year's Annual Report, we have showcased the commemorative postage stamp brought out by the Indian Posts and Telegraphs Department on 2nd December, 1974.

**This stamp marks an important milestone:
The XIX International Dairy Congress held in New Delhi
from 2nd to 6th December, 1974.**

This major global dairy conference was held in India within a decade of the formation of National Dairy Development Board, which was established in 1965 – recognising India's determination and potential to become the global leader in sustainable dairy development.



Today, India is the world's top milk producer – a testimony to the millions of dairy farmers, and a tribute to the vision of the 'Milkman of India' – Late Dr. Verghese Kurien, whose birth centenary we are proudly celebrating in 2021.

We have taken commemorative stamps and post-marks concept in designing this year's Annual Report to celebrate the nostalgic world of philately.

	Design: The motif on the stamp is adopted from a Pechwai (hand-painted clothes hangings from Rajasthan) and shows a part of a scene depicting Krishna as Gopal Bal going out with cows.	Type: Stamp, Postal Used	Perforation: 14x13.5
		Colour: Multicolour	Number Printed: 30,00,000
		Denomination: 25 Paise	Number per issue sheet: 42
		Overall Size: 3.34x2.88 Cms.	Printing Process: Photogravure
		Printing Size: 2.987x2.524 Cms.	Designed and Printed at: India Security Press

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Tribute to the Milkman of India

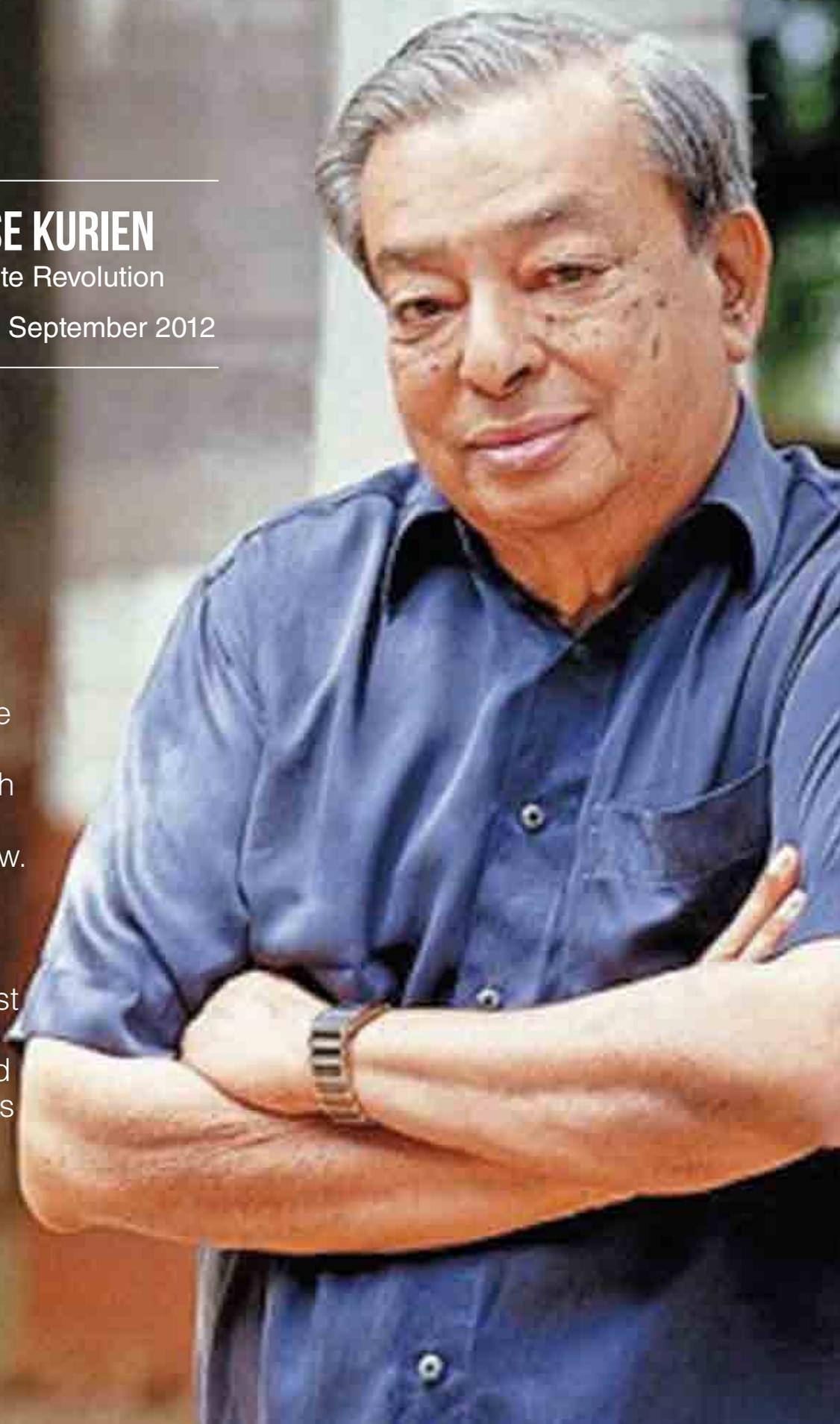
DR. VERGHESE KURIEN

The Father of White Revolution

26 November 1921 - 9 September 2012



We have traversed a path that few have dared to. We are continuing on a path that still fewer have the courage to follow. We must pursue a path that even fewer can dream to pursue. Yet, we must – because we hold in trust the aims and aspirations of millions of our countrymen.



AT NDDDB, WE PLEDGE TO FOLLOW THE FOOTSTEPS AND LEGACY OF DR. KURIEN - THE MAN WHO GAVE INDIA THE BILLION-LITRE DREAM, AND MADE IT COME TRUE, LONG BEFORE THE UNICORNS GAVE THE WORLD BILLION-DOLLAR COMPANIES.



Dr. Verghese Kurien is synonymous with India's White Revolution. He pioneered the Anand model of dairy milk cooperatives and then successfully replicated it across the country. Under his visionary leadership, dairy farming became India's largest self-sustaining industry and the largest rural employment sector. His vision made India the top producer of milk in the world – doubling milk available for each Indian and increasing milk output four-fold.

The unique social entrepreneurship-ownership model pioneered by Dr. Kurien has dairy farmers controlling procurement, processing and marketing of milk and milk products. No milk from a farmer is refused, and almost 80 per cent revenues are paid back to the farmers.

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MEMBERS OF THE BOARD

(As on 31st March 2021)

Shri Dilip Rath ¹

Chairman

Ms. Varsha Joshi ²

Chairman

Joint Secretary (Cattle & Dairy Development) ⁴
Department of Animal Husbandry & Dairying
Ministry of Fisheries, Animal Husbandry & Dairying
Government of India

Shri Mihir Kumar Singh ³

Joint Secretary (Cattle & Dairy Development)

Department of Animal Husbandry & Dairying
Ministry of Fisheries, Animal Husbandry & Dairying
Government of India

Prof. Guru Prasad Singh ⁵

Institute of Agricultural Sciences
Banaras Hindu University
Varanasi

Smt. N Vijayalaxmi ⁶

Chairperson

Bihar State Milk Co-operative Federation Ltd. (COMFED)

Shri Bhuvnesh Kumar ⁷

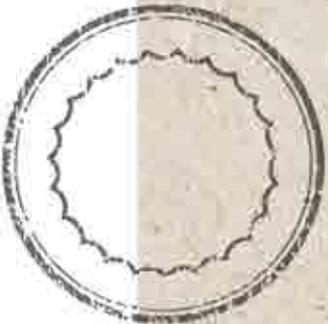
Chairman

Pradeshik Co-operative Dairy Federation Ltd. Uttar Pradesh

Shri Meenesh C Shah

Executive Director

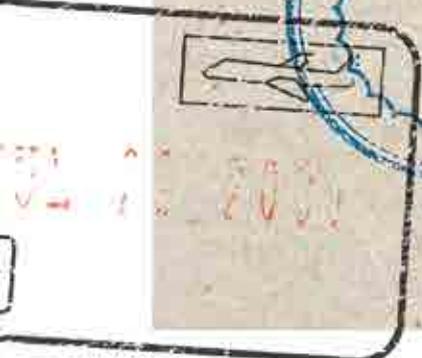
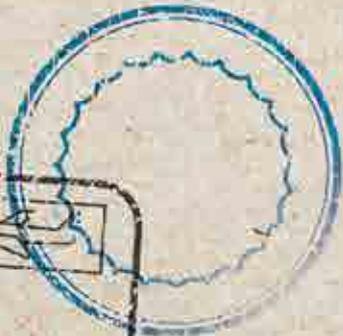
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1. Up to 30 November 2020
 2. With effect from 1 December 2020
 3. Up to 30 June 2020
 4. With effect from 6 August 2020
 5. Up to 27 February 2021
 6. Up to 3 December 2020
 7. With effect from 8 May 2020



THE YEAR

IN

RETROSPECT



The estimated per capita availability of milk is expected to be about 425 grams per day which is more than the world average of around 315 grams per day.

During the COVID-19 pandemic, the Cooperative dairy sector proved to be resilient as it continued to procure milk from farmers and supply it to the consumers despite several logistical and other challenges.

Milk production in India did not show any sign of slowdown. Milk production is anticipated to be around 211 million tonnes in 2020-21, an increase of about 6.3 per cent over the previous year. The estimated per capita availability of milk is expected to increase to about 425 grams per day which is more than the world average of around 315 grams per day.

The year had been very challenging for the dairy cooperatives as it was inundated with additional supply of milk, drop in milk sales and accumulation of stocks of conserved commodities. Milk procurement by the dairy cooperatives continued to rise throughout the year as it accepted the diverted additional milk of the farmers which was otherwise sold to private and unorganised players. Milk procurement by the dairy cooperatives registered an increase of 7.9 per cent during 2020-21. The rise in milk procurement was not commensurate with the growth in milk sale by dairy cooperatives. The unparalleled strict restrictions that were put in place to curb the spread of the coronavirus led to plummeting of average daily liquid milk sales from 385 LLPD in February 2020 to 316 LLPD during April 2020. However, after April 2020, the liquid milk sales improved as

restrictions were eased. Yet, overall sales declined by 2.6 per cent during the year as compared to the previous year.

Despite strenuous situation, dairy cooperatives supported livelihood of farmers by maintaining the procurement price of milk. It continued to pay an average price of about ₹ 31 per litre for 4.5 per cent Fat and 8.5 per cent SNF content of milk during the year 2020-21.

The widening gap between milk procurement and sale resulted in the piling up of stocks of conserved commodities like skim milk powder (SMP) and white butter and blocking the working capital. To overcome this, the Government of India had launched “Interest subvention on Working Capital Loans” component under the existing central sector scheme – “Supporting Dairy Cooperatives and Farmer Producer Organisations engaged in dairy activities (SDCFPO)” scheme. The scheme is being implemented by the Department of Animal Husbandry & Dairying (DAHD) through National Dairy Development Board (NDDB).

This situation resulted in a decline in prices of SMP and white butter during the first half of the year 2020-21. The SMP prices declined from about ₹ 270 per Kg in April 2020 to less than ₹ 200 per Kg during the first half of the financial year. The price, however, gradually recovered and hovered around ₹ 250 per Kg by end of March 2021.



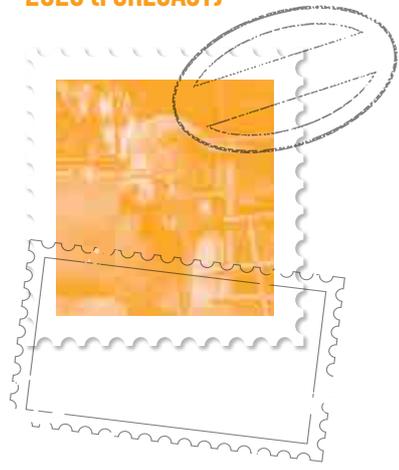
211 MILLION TONNES

MILK PRODUCTION IN 2020-21 (ANTICIPATED)



860 MILLION TONNES

GLOBAL MILK PRODUCTION IN 2020 (FORECAST)



International Dairy Scenario

As per FAO, the Global milk production is expected to be at 860 million tonnes in 2020 on account of increase in milk production across most of the regions. The increase in global milk production had largely been attributed to increase in the number of dairy animals and COVID-19 assistance programmes across major countries.

The pandemic spread globally and affected the international dairy commodity prices. Worldwide, the restrictive COVID-19 guidelines and bottlenecks in transportation had created difficulty in trade. In addition, the peak seasonal production in the Northern Hemisphere during March to May further dampened the dairy commodity prices. The international SMP price declined by about 22 per cent and butter by about 16 per cent between January and May 2020.

The situation, however, started improving during the second half of the year with the gradual revival in the import demand and easing of COVID-19 related restrictions. As per FAO, the strong import demand from China, Algeria, Saudi Arabia and Brazil had led the dairy trade to increase by 1.2 per cent at about 79 million tonnes (milk equivalent) in 2020. While the trade in whole milk powder (WMP), whey powder and cheese increased, it declined for SMP and butter during the year.

The revival in import demand provided support to the international dairy commodity prices during second half of the year. Both the SMP and butter prices increased by about 20 per cent each between May and December 2020. As per FAO, SMP was traded at US\$ 2,744 per tonne, while butter at US\$ 4,098 by end of December 2020.

Technical Support to Government of India

NDDDB continued its support to various regulatory, scientific and advisory bodies like the Department of Animal Husbandry and Dairying (DAHD), Food Safety and Standards Authority of India (FSSAI), Bureau of Indian Standards (BIS), Exports Inspection Council of India (EICI) etc. during the year. Support for evaluation of the dairies export-worthiness was also provided to the Exports Inspection Agency (EIA) as a panelist.

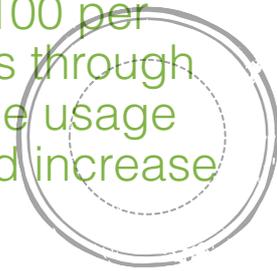
Digital Milk Producers' Award

NDDDB organised a Digital Milk Producers' Award on National Milk Day. Milk Unions and Milk Producer Companies were awarded certificates of appreciation for preferring digital mode of milk bill payment to farmers. The award function encouraged milk producers to receive 100 per cent milk bill payments through banks and increase the usage of digital platforms and increase transparency. In this programme, NDDDB honoured three milk producers from small, medium and large category each from a state and UT.

e-GOPALA: A digital platform on Animal Husbandry for Livestock Farmers

Recognising the urgent need of a digital platform to support dairy farmers in managing their animals especially in the pandemic times, NDDDB developed an android application called "e-GOPALA". Honourable Prime Minister inaugurated the e-GOPALA App in September 2020. This application is available for free download on Google Play Store and can be used in seven regional languages namely Hindi, Gujarati, Marathi, Odia, Kannada, Malayalam and English. Till March 2021, this application has been downloaded more than 66,000 times. This digital platform can be used for obtaining Pashu Aadhaar, Pashu Poshan, Ethno-veterinary Medicines (EVM), Animal Breeding related services and information.

The Digital Milk Producers' Award function encouraged milk producers to receive 100 per cent milk bill payments through banks and increase the usage of digital platforms and increase transparency.



This App also provides a platform for buying and selling of dairy animals, bovine semen, embryo etc.

Pashu Mitra: NDDDB Call Centre

NDDDB has established a call centre: Pashu Mitra with number 7574835051. Through which dairy farmers can directly contact subject matter specialist in NDDDB for their queries related to Animal Health, Animal Breeding, and Animal Nutrition.

Dairy Surveyor Application: A Step towards Digitalisation

NDDDB launched "Dairy Surveyor" — a GIS-enabled field data collection, visualisation, and decision-making android application during the National Milk Day Celebration, which facilitates real-time monitoring and planning of various dairy activities.

This mobile application not only captures data but also captures latitude and longitude of the location which makes it a unique application. Dairy Surveyor application can be utilised for infrastructure mapping, monitoring of field projects and various surveys.

NDDDB has completed the first phase of orientation programme with each of the interested Institution about usage of the application and GIS server for geospatial analysis of collected data through video-conferences.



66,000
NUMBER OF DOWNLOADS FOR
THE E-GOPALA APP





Collaboration with ICRISAT

NDDB and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) signed a Memorandum of Understanding (MoU) to develop and commercialise agri-technologies that find application in the dairy domain, explore and organise capacity building workshops, knowledge exchange sessions and training programme, agri-based entrepreneurship promotion and rural community development.

Under the framework of this MoU, ICRISAT and NDDB have

collaborated to develop a device for rapid detection of aflatoxin B1 in animal feed, feed raw materials that are the principal source of aflatoxin M1 in milk, a Group I carcinogen.

Taking OPU-IVEP to Farmers

NDDB collaborated with Amul for transfer of embryos in their Calf Rearing Station, Sarsa. NDDB transferred 100 IVF embryos in this farm, established 25 pregnancies and trained 11 veterinarians during the process. NDDB is in the process to implement OPU-IVEP technology in other milk shed areas through hub and spoke model.

During the year, NDDB also initiated OPU-IVEP work in buffaloes. The efforts were successful and the OPU-IVEP in buffalo has been standardised in field condition. The results obtained were encouraging and would facilitate in scaling up the use of technology for enhancement of milk production of buffaloes.

Support to Cooperatives During COVID-19

The Dairy Board developed and disseminated exclusive posters on COVID-19 preventive measures for ensuring safety and hygiene in the dairy supply chain. These were shared with DAHD, Government of India, circulated to all dairy cooperatives across the country and promoted through digital media.

NDDB launched an interactive digital webinar series titled “NDDB SAMVAD” linking all stakeholders related to the dairy cooperative sector. This digital platform helped create awareness and ensured sharing of information on new innovations/technologies with dairy farmers. NDDB organised awareness programmes for cattle management, through Prasar Bharti. More than 200 webinars were conducted to help farmers tide over the crisis.

POIs make investment in their dairy business on continuous basis by availing assistance under different central and state government schemes. During the challenging period of COVID-19 pandemic, NDDB started helping POIs in preparation of Detailed Project Report (DPR) on pro bono basis.

As a part of this initiative, NDDB has assisted West Assam Milk Union Limited (WAMUL), Karnataka Milk Federation (KMF), Haryana Dairy Development Cooperative Federation Limited (HDDCF), Midnapore Milk Union, Barauni Milk Union, Baramati Milk Union, Pali Milk Union, and Sabarkantha Milk Union in preparation of DPRs for receiving assistance under various Central and State Government schemes.

NDDB implemented the “Interest Subvention on working capital loans” during the year 2020-21. The scheme is meant for Dairy cooperatives to avail loans from Banks and Financial Institutions. The scheme enabled Cooperatives and producer institutions to make regular payments to dairy farmers.

NDDB experts provided support to cattle feed plants for reformulating cattle feed using least cost formulations after considering prices and local availability of raw ingredients.

NDDB also promoted Ethno Veterinary Medicine, a cost-effective alternative for management of some major ailments of milch animals.



200+

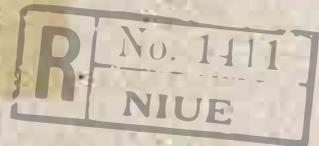
NUMBER OF WEBINARS
CONDUCTED FOR FARMERS
DURING COVID-19

NDDB launched an interactive digital webinar series titled “NDDB SAMVAD” linking all stakeholders related to the dairy cooperative sector. This digital platform helped create awareness and ensured sharing of information on new innovations/technologies with dairy farmers.





ENCOURAGING COOPERATIVE BUSINESS



12

National Dairy Development Board



Even during the unprecedented lockdown owing to COVID-19 pandemic, NDDDB's intervention ensured milk collection by dairy cooperatives and its uninterrupted supply to consumers on continual basis. NDDDB continued providing guidance to the dairy cooperatives in order to protect the interest of the farmer members.

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APR 25 1916

During the year, cooperative milk unions covered about 1,96,114 village dairy cooperative societies (DCS) with a cumulative membership of 17.26 million milk producers. The cooperative milk unions procured an average of 51.8 million Kg of milk per day compared to 48 million Kg in the previous year with an increase of about 8 per cent. The sales of liquid milk reached 36.1 million litres per day showing a decline of about 3 per cent over the previous year.

Active participation of women in all spheres of dairy cooperative business and governance is central to dairy development in the country. During 2020-21, women membership increased to 5.41 million registering an annual growth of 1.9 per cent over the previous year.

West Assam Milk Producers' Cooperative Union Limited

NDDDB continued to manage West Assam Milk Producers' Cooperative Union Limited (WAMUL) popularly known as Purabi Dairy. During the year, WAMUL reported an average milk procurement of 28,492 Kg per day from 13,916 dairy farmers associated with 359 dairy cooperative societies covering around 949 villages. The average milk procurement price paid by WAMUL to its dairy farmers was around ₹ 36 per Kg.

During the year, WAMUL sold around 63,000 litres per day of packed liquid milk and milk equivalent of products such as paneer, sweet curd, plain curd, lassi, cream and ghee under its registered brand 'Purabi'. WAMUL continued to fortify its standard and toned milk with vitamins A & D. The year saw WAMUL adopting mobile distribution and robust home delivery approaches to maximise its sales of milk and milk products in view of the nationwide and local lockdowns due to the pandemic. During 2020-21, although the markets were adversely impacted due to the outbreak, WAMUL still managed to attain a sales turnover of around ₹ 1,200 million which is around 15 per cent higher than the sales turnover achieved during previous financial year.

During the year, WAMUL adopted an environment-friendly approach by installing and commissioning solar-powered instant milk chilling units of 1,000 litre capacity in two of its BMC centres in Barpeta district under the World Bank aided project – Assam Agribusiness and Rural Transformation Project (APART). The midterm review of APART had found the activities of WAMUL under formal dairy sector to be satisfactory.

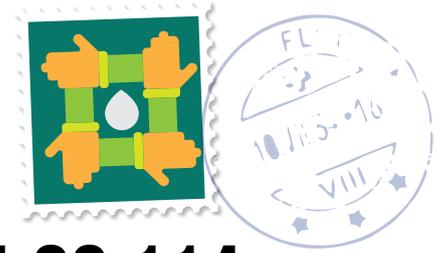
WAMUL reported 4,58,027 AIs in over 3,000 villages through a network of 452 mobile AI technicians (MAITs) in the districts falling under APART. A total of 1,49,942 calves (of which 79,007 are female calves) were born during the year.

Moreover, during the year, WAMUL undertook demonstrations of urea treated paddy straws and green fodder silages, developed nurseries and demonstration plots of fodder crops and medicinal plants under Pashu Ayurveda activities and initiated programmes such as calf nutrition popularisation programme and Ration Balancing Programme (RBP) for better feed management of young and adult milch animals.

Twelve metric tonnes per day capacity mineral mixture plant and 25 metric tonnes per day capacity bypass protein plant were commissioned at Changsari in Kamrup district under RIDF-XXIII funding assistance from NABARD through the Government of Assam. Civil works under the dairy expansion project of WAMUL under APART commenced during the year.

Jharkhand Milk Federation

NDDDB continued to manage the Jharkhand State Cooperative Milk Producer's Federation Limited (JMF). The federation procured an average 106.93 TKg milk per day from more than 20,000 members covering about 2,460 villages. The federation paid about ₹ 1,163.2 million towards milk bill payment through direct bank transfer to the individual bank accounts of milk producers during the financial year 2020-21. JMF marketed liquid milk averaging 108.57 LLLPD



1,96,114

NUMBER OF DCS COVERED BY MILK UNIONS WITH A CUMULATIVE MEMBERSHIP OF 17.26 MILLION MILK PRODUCERS

during the year. 482 DPMCU & 93 AMCU have been installed in village DCSs to enhance and ensure transparent and efficient operations. Construction of three new dairies of 50 TLPD capacity (expandable to 100 TLPD) each at Sarath, Sahebganj and Palamu is in progress.

Dairy Development Initiative in Vidarbha & Marathwada Regions of Maharashtra

The Vidarbha and Marathwada Dairy Development Project (VMDDP) is being implemented in the drought prone Vidarbha and Marathwada regions of Maharashtra to make dairying a source of sustainable livelihood and poverty alleviation. The project has provided an efficient institutional platform at village level for sale of dairy farmers' milk at optimum value and made available various productivity enhancement services to enhance milk productivity of dairy animals in these regions.

Mother Dairy Fruit & Vegetable Pvt. Ltd. (MDFVPL), a wholly-owned subsidiary of NDDB, established a transparent milk procurement and payment system at village level by setting-up of village level institutions equipped with milk testing and chilling facilities. It provided market access to thousands of dairy farmers along with better value for their milk which encourages them to adopt dairying as an income generating activity in the region.

As on 31st March 2021, MDFVPL expanded its coverage to nearly 2,700 villages by establishing more than 1,600 functional Milk Pooling Points (MPPs) and procured over 200 TkgPD of milk from 25,103 milk producers. During the year, MDFVPL has made milk bill payments of nearly ₹ 2,500 million directly in the bank accounts of the milk producers, ensuring 100 per cent digital payment.

Milk received from farmers of Vidarbha and Marathwada regions is processed in Nagpur Dairy Plant and packed liquid milk, apart from various dairy products, is sold in cities like Nagpur, Amravati, Chandrapur, Akola, Wardha, Yavatmal and Bhandara.

MDFVPL is also making available cattle feed and mineral mixture to milk producers for improving milk productivity and overall health of the animals.

To demonstrate the benefits of high productive indigenous milch cows which best suit to the climatic condition of the region, NDDB had

inducted three high yielding Rathi breed cows in this region. As results were encouraging, farmers of the region have started inducting Rathi cows from its native tract in Rajasthan. About 193 Rathi cows have been inducted till March 2021.

While MDFVPL is creating milk procurement network in the project area, simultaneously, Government of Maharashtra (GoM) is providing productivity enhancement services like animal induction, doorstep delivery of AI services, fodder development support, animal health services and Ration Balancing Advisory Services to the milk producers.

The project is gradually transforming the lives of dairy farmers in these drought prone regions by providing an institutional platform at village level for sale of their milk, regular payment of milk bill based on the quality & quantity of milk poured and enhancing milk productivity of animals through adoption of scientific breeding & feeding practices for their milch animals.

Milk Producer Companies

During the year, NDDB Dairy Services (NDS), the wholly-owned subsidiary of NDDB, facilitated operationalisation of Ujalaa Milk Producer Company (MPC) in Kota, Rajasthan. Ujalaa MPC was incorporated in October 2020. Ujalaa MPC has enrolled about 900 members in 53 villages and reached an average milk procurement of about 1,500 Kg per day.

Thus, NDS has successfully set up 16 MPCs, out of which, five are being supported under the National Rural Livelihoods Mission (NRLM). Ten of these MPCs have an all-women membership and all the producers-directors on their respective boards are women.

Together, these MPCs have around 0.67 million milk producers spread over about 15,980 villages. 63 per cent of these producers are women and 64 per cent are small holder milk producers. The members of these 16 companies raised around ₹ 1,617 million towards share capital. The companies together procured about 29 lakh Kg of milk per day during 2020-21 and together achieved a gross turnover of about ₹ 47,790 million during the year.

In the MPCs technically supported by NDS, productivity enhancement activities such as Artificial Insemination and Ration Balancing Programmes were undertaken in addition to Capacity Building activities like Farmer Workshops, Dairy Farm Management training. To promote antibiotic-free milk, NDS has initiated the use of ethno-veterinary practices in these MPCs. During the year, more than 9 lakh AIs were carried out in the operational areas of these MPCs. Additionally, about 75,000 MT of cattle feed and 480 MT of mineral mixture were also sold among the members of the various MPCs.

Parameters	Paayas (Rajasthan)	Maahi (Gujarat)	Shreeja (A.P.)	Baani (Punjab)	Saahaj (U.P.)	Bapudham (Bihar)	Total of MPCs
Head Office	Jaipur	Rajkot	Chittoor	Patiala	Agra	Champan East	
Date of Operationalisation	1-Dec-12	18-Mar-13	15-Sep-14	6-Nov-14	12-Dec-14	2-Oct-17	
No. of Districts [#]	13	10	8	10	16	7	64
No. of Villages with Members	3,240	2,342	1,552	1,290	2,841	1,196	12,461
No. of Members including Provisional members	110,781	93,562	98,385	62,220	107,487	49,358	5,21,793
Women membership (%)	39	42	100	33	47	60	-
Small holders (% of Members) *	40	55	95	40	69	92	-
Paid-up Share Capital (in million)	402	354	229	124	292	38	1,439
Average Milk Procurement ('000 Kg Per Day)	693	656	376	270	510	57	2,563
Average Polypack Milk Sales (TLPD)	43	300	27	14	20	NA	404
Average Bulk Milk Sales (TLPD)	632	320	386	246	475	56	2,115
Gross Turnover FYTD (₹ in million Audited)	11,892	12,662	5,121	4,157	7,713	967	42,513

[#] Districts with >=200 Members have been considered for count of Operational District. District count is based on Census 2001/2011 Code.

* <=3 Milch animals holding households



0.67 MILLION
TOTAL NUMBER OF MILK
PRODUCERS, OF WHICH, 63 PER
CENT ARE WOMEN

Marketing Support to Dairy Cooperatives

NDDB formed a marketing cell in March 2020, through which NDDB will be extending marketing support to over 50 milk unions across India. The scheme will support the cooperatives in improving the cold chain infrastructure as well as brand development of small dairy cooperatives across the country.

During the year, marketing plans were firmed up to increase milk sales of six milk unions. Retailers' surveys were conducted for milk unions in Pune & Aurangabad. Series of webinars were organised on various topics on sales and marketing wherein eminent professionals from dairy industry shared their experiences. Field surveys were conducted for Lucknow and Varanasi milk unions for in-depth understanding of the local market. Besides, a study of commission structures across dairy cooperatives in major states was undertaken to examine market integration in dairy sector and gain insight on local factors affecting trade commission structure. Maiden efforts were made to develop Standard Operating Procedures for various functions of sales and distribution so as to facilitate smaller milk unions.

Manure Management Initiatives

NDDB has established Manure Value Chain in Zakariyapura and Mujkuva villages in Anand, Gujarat. Slurry procured from Biogas owner farmers is used to manufacture agricultural inputs namely PROM, Grade III

micronutrient, root guard, etc. These products help in improving plant defence and are made available to the farmers.

A study on the effect of Biogas slurry based Su-dhan products on growth and yield of wheat (rabi) and maize (kharif) crops undertaken by Anand Agricultural University completed during the year. The study showed the extent of improvement in grain yield of wheat and maize crop was to the tune of 24 and 32 per cent, respectively over 100 per cent recommended dose of fertiliser besides improving the quality of grain in terms of important micronutrient and protein content. The application of Su-dhan products reduced the use of chemical fertilisers by 25 per cent and improved the soil health as well.

NDDB through funding support from Indian Oil Corporation Limited (IOCL), Barauni and NDDB Foundation for Nutrition (NFN) initiated implementation of the manure management model at Barauni Milk Union (Bihar) and Cuttack Milk Union (Odisha) during the year.

NDDB signed an MoU with the Department of Drinking Water and Sanitation and the Department of Animal Husbandry and Dairying for propagation of Manure Management Model under the Gobardhan scheme of Government of India. NDDB was appointed as the technical partner

under the Gobardhan scheme for implementation of the small holder based manure management model across the country.

New National Biogas and Organic Manure Programme

During the year, NDDB as the "Main Programme Implementing Agency" of Central Sector Scheme "New National Biogas and Organic Manure Programme" (NNBOMP) implemented by MNRE approved proposals submitted by 10 milk unions and two milk producer companies from the states of Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu respectively. The sanctioned proposals covered more than 400 beneficiaries with installation of as many domestic biogas plants of various models and capacities under the scheme.

AMCS Support to Dairy Cooperatives

NDDB has developed a robust integrated Common Automatic Milk Collection Software (AMCS) for meeting the complete requirements of the DCS operations while ensuring full integration at Union, Federation and National Level. It also provides functionalities for financial inclusion and a mobile application so that key information is provided to various stakeholders (Milk Producer Member, DCS Secretary and Milk Procurement Supervisor) in a concurrent and timely manner.



Shri Parameswaran Iyer, Secretary, Department of Drinking Water & Sanitation, Ministry of Jal Shakti, Govt of India got first hand experience about NDDB's flexi-bio gas units in Zakariyapura village, Anand.

So far, NDDB's common AMCS application is being used by more than 4,500 DCS' of 25 Milk Unions in eight State Milk Federations across the country. During the year, two milk unions namely, Midnapore Milk Union (West Bengal) and Jabalpur Milk Union (Madhya Pradesh) were taken on-board. Apart from enhancing transparency in Milk Procurement operations, the AMCS application facilitates milk unions to send Milk Bill Payments directly into the bank accounts of milk pourers.

Dairying through Cooperatives – Key to Sustainable Livelihood

A pilot project "Dairying through Cooperatives – key to sustainable livelihood" has been formulated to improve the livelihood of dairy farmers through various dairy development interventions by availing Official Development Assistance (ODA) loan from Japan International Cooperation Agency (JICA). Specific interventions under the project have been envisaged for setting-up milk procurement systems, milk processing, marketing & ICT infrastructure along with activities for productivity enhancement of milch animals with special focus on training & capacity building for the dairy farmers and staff of Producers' Owned Institutions (POIs). The project will be implemented by Department of Animal Husbandry and Dairying, GoI, through NDDB.

The project has been appraised by JICA and the loan agreement between Government of India and JICA has been executed. The project is expected to be rolled out after necessary approvals by Government of India.

Dairy Processing & Infrastructure Development Fund

NDDB is an Implementing Agency for "Dairy Processing & Infrastructure Development Fund (DIDF)", a scheme of Government of India (GoI) with the implementation period from 2018-19 to 2022-23. The major components of the



scheme are creation, modernisation and expansion of milk processing infrastructure, manufacturing facilities for value-added products, setting-up of chilling infrastructure and electronic milk testing equipment at village level. The scheme has a financial outlay of ₹ 1,11,840 million comprising of ₹ 80,040 million as loan from National Bank for Agriculture and Rural Development (NABARD), ₹ 20,010 million as End Borrowers' contribution, ₹ 120 million to be contributed by Implementing Agencies towards Project Management & Learning, and interest subvention of ₹ 11,670 million from Government of India to NABARD. The Cooperative Milk Unions, State Cooperative Dairy Federations,

Multi-state Milk Cooperatives, Milk Producer Companies and NDDB subsidiaries are the eligible End Borrowers under the scheme.

As on 31st March 2021, 40 projects with an outlay of ₹ 49,568 million including loan of ₹ 33,810 million have been approved. Funds of ₹ 11,316 million have been released to the Producer Owned Institutions (POIs) under the scheme. The implementation of the approved projects will enhance the milk processing capacities of POIs by 12.17 million litres per day. As on 31st March 2021, seven projects have been completed, with creation of milk processing capacity of 4.25 million litres per day.

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CHAMARAJANAGAR MILK UNION

UNDER DIDF SCHEME

Chamarajanagar Milk Union was established in 2015 after bifurcation from Mysore Chamarajanagar District Cooperative Milk Union. It operates in Chamarajanagar district in Karnataka, having a large percentage of forest coverage (about 48 per cent) and has high population of forest dwelling tribals like the Soligas, Yeravas, Jenu Kurubas and Betta Kurubas, who are mostly dependent on farming & animal husbandry for their livelihood.

During 2020-21, the union procured 252.3 thousand Kg per day (TKgPD) milk from 96 thousand producer members of 473 village level Dairy Cooperative Societies. The union is now processing milk in its ultra-modern plant, into different variants of packed liquid milk and milk products such as curd, ghee, peda, etc. After meeting local demand for milk & milk products, the union is also selling UHT milk in North-Eastern region of the country.

Back in 2015, when the Union was bifurcated from Mysore Chamarajanagar District Cooperative Milk Union, the milk processing & sales were being handled by Mysore Milk Union,

as the newly formed Union did not have any milk processing facility. This continued till June 2020, when Chamarajanagar Milk Union started operations in its newly established dairy plant of 300 TLPD capacity (expandable to 500 TLPD) along with UHT Plant of 200 TLPD capacity at Kuderu, Chamarajanagar. The entire financial assistance for the project was availed under Dairy Processing and Infrastructure Development Fund (DIDF) scheme of Government of India, being implemented by National Dairy Development Board (NDDB). The union availed ₹ 600 million as loan at a concessional rate of interest under DIDF scheme, which was about 3-4 per cent lower than the market rate and contributed ₹ 650 million from its own resources.

The establishment of this new plant helped the union to expand its procurement and sales operation. Milk procurement and liquid milk sale of the union in 2020-21 grew by 8 per cent and 47 per cent respectively, even in COVID-19 pandemic year, compared to the previous year.

The operational area of the union does not have any big town for marketing of milk & milk products, but has many tourist places like MM Hills, BR Hills, Shivasamudram Falls etc. which attract tourists on weekends from nearby areas. During

2020-21, the union sold 107.6 TLPD of milk, of which, 30.6 TLPD was sold in its operational area, and around 77.0 TLPD of UHT milk was sold in North-Eastern region of the country. The union also sold around 111.5 TKgPD of bulk milk to nearby states of Tamil Nadu & Kerala. Upon commissioning of the new dairy plant, it is exploring market in the nearby districts viz. Nilgiris (Ooty) & Coimbatore in Tamil Nadu, which will contribute significantly to the revenue in near future.

Most importantly, even during the difficult period of COVID-19 pandemic (i.e. 2020-21) when number of milk unions in India had reduced milk procurement price, Chamarajanagar Milk Union was able to provide a better price to its producer members. During 2020-21, the union paid ₹ 26.77 per Kg of milk to its producer members, as against ₹ 26.42 per Kg of milk during the last year. This has encouraged the milk producers to stay associated with the union.

The Chamarajanagar Milk Union is one such union which has made the best use of newly commissioned infrastructure and opportunities available under DIDF scheme.

DIDF Scheme Helped the Union in:

- Establishing new state-of-the-art dairy/UHT plant.
- Manufacturing value-added products such as UHT milk, curd, ghee, peda, etc.
- Handling additional volume of milk received during COVID-19 pandemic.
- Paying better price to its producer members, even during the COVID-19 pandemic, when most of the Unions had reduced procurement prices.



Interest Subvention to Producers Owned Institutions for Working Capital Loans

On account of difficulties faced by the POIs due to COVID-19 pandemic related restrictions, Government of India introduced scheme for "Interest Subvention on working capital loans" during the year 2020-21, with an outlay of ₹ 2,030 million. The scheme provides for interest subvention of 2 per cent Per Annum (P.A.) on working capital loans availed by the eligible Participating Agencies from banks and financial institutions. For prompt and timely repayment, additional 2 per cent P.A. interest subvention is payable at the end of the loan repayment period. The component of Interest Subvention has been included under the scheme "Supporting Dairy Cooperatives and Farmer Producer Organisations engaged in dairy activities (SDCFPO)". The scheme is being implemented through NDDB.

During the year 2020-21, interest subvention amounting to ₹ 458.42 million has been released to POIs.

The scheme enabled the POIs to make regular payments to dairy farmers with the help of interest subvention on working capital loans of ₹ 1,06,486 million sanctioned by Banks.

Financial Assistance to Producers' Owned Institutions

NDDB provides financial assistance to POIs for enhancing their infrastructure for milk processing, feed manufacturing, solar applications in dairy plants and other activities like skill development. As on 31st March, 2021, under the scheme "Providing Financial Assistance for Infrastructure Activities, Skill Development and Trainings", projects of POIs with a total outlay of ₹ 15,656 million have been sanctioned. During the year 2020-21, long-term financial assistance of ₹ 620 million was disbursed to POIs.

As on 31st March, 2021, aggregate working capital facility of ₹ 985 million has also been approved to POIs.



₹ 620 MILLION

LONG-TERM FINANCIAL ASSISTANCE OF ₹ 620 MILLION WAS DISBURSED TO POIS DURING 2020-21

Quality Assurance

NDDDB continued to strengthen its Quality Mark initiative by encouraging and hand-holding various milk unions, producer companies and federations to align with the updated guidelines. Since the roll-out of Quality Mark in 2016, NDDDB received 110 applications from dairy cooperatives till 31st March 2021; and from these 46 dairy units were awarded Quality Mark. Out of these, 46 Quality Mark awardee units, 26 applied afresh for renewal after completing three years of successful implementation of Quality Mark scheme; and were again found eligible for award of Quality Mark after undergoing laid down assessment process. Knowledge and experience sharing by an expert panel & providing suggestion to improve food safety aspects are the prominent features of Quality Mark assessment to facilitate the process improvement in the entire value chain from producer to consumer. These dairy co-operatives have exhibited commitment in complying with the improvement suggestions, thereby endorsing their faith in the Quality Mark initiative.

Dairy Board encourages knowledge sharing - Specifications of process equipment, products and strengthening of laboratory equipment/instruments. Guidance documents and Standard Operating Procedures (SOP's) for dairy plants were developed and shared with the cooperatives in order to ensure safety and hygiene in dairy processing units during COVID-19 pandemic. In continued pursuit to improve the quality of milk, right from the farm level, education and training programmes are conducted through virtual mode for farmers, procurement personnel & supervisors and newly recruited dairy staff of federations.

NDDDB Foundation for Nutrition

During 2020-21, NDDDB Foundation for Nutrition (NFN) scaled up its operations to include about 12,000 students of Government schools

in Nagaland, Manipur, Sikkim and Tripura under the CSR assistance of National Highways & Infrastructure Development Corporation Limited (NHIDCL), New Delhi.

Owing to the COVID-19 pandemic and closing of schools as part of containment measures, NFN has not been able to distribute Giftmilk in its ongoing programme schools. In the meantime, NFN has taken an initiative to distribute Giftmilk as Take Home Milk for its programme schools in Delhi, Gujarat and Tamil Nadu under the CSR assistance of India Trade Promotion Organisation (ITPO), IDMC Ltd and Indian Immunologicals Limited (IIL).

So far, NFN has provided Giftmilk to about 72,000 students in 172 government schools in 11 States namely, Delhi, Gujarat, Jharkhand, Maharashtra, Manipur, Nagaland, Sikkim, Tamil Nadu, Telangana, Tripura and Uttar Pradesh. Since inception, 9.2 million units of milk has been distributed in the programme schools.

NFN organised activities for nutrition awareness and importance of milk in building immunity. It also celebrated Rashtriya Poshan Maah, World School Milk Day and facilitated in organising an e-campaign on breast feeding week.

NFN signed an agreement with Electronics Corporation of India Limited (ECIL), Hyderabad for 1,200 students in Bhupalpally, Telangana; National Fertilizers Limited (NFL), Noida for 500 students in Guna, Madhya Pradesh; and Mazagon Dock Shipbuilders Limited (MDL), Mumbai for 5,000 students in Gadchiroli, Maharashtra to initiate Giftmilk programme during 2021-22.

NFN initiated 'GoGreen' - a manure management programme in Cuttack with the partnership of Cuttack Cooperative Milk Producers Union Limited, Odisha under the CSR assistance of IIL.

Awareness Creation

Reaching out to milk producers and stakeholders of Indian dairying network, NDDDB undertook numerous activities including circulation of publications for generating awareness about SOPs to be followed in the Dairy Value Chain during COVID Pandemic and other extension activities.

Interactive content, success stories and initiatives on popular social media platforms like Facebook, YouTube, Twitter, Instagram and LinkedIn were put up to engage, motivate and educate people involved in the dairy sector. Digital campaigns and competitions for World Milk Day, World Breast Feeding Week (Suraksha ka Kavach), National Nutrition Month, were planned and executed for active engagement of public through NDDDB's social media handles.

Extension materials covering topics on animal health, ethno-veterinary practices, animal welfare etc., were developed and circulated in major vernacular languages so that dairy farmers in every corner of the country can access them.

Extension films covering Biogas projects initiated in different regions, Dairy Surveyor app and its features, Success Stories on women dairy farmers of Sabarkantha and Banaskantha, FMD vaccination, Pashu Seva app, Quality Mark Verka Pashu Aahar were produced and uploaded on social media. NDDDB also published a series of 'Technews' on its knowledge portal to inform & update stakeholders.

Virtual tours of the organisation to regularly update and interact with stakeholders, trainees and students considering the pandemic and safety protocols were organised.

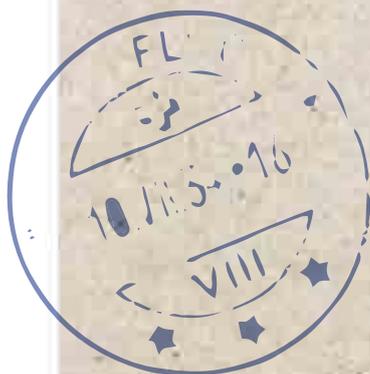
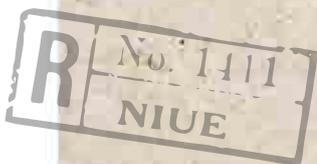
ENHANCING PRODUCTIVITY

Animal Breeding

Success of animal breeding programmes largely depends on identification of superior germplasm and their faster multiplication to produce superior replacement male and female animals. Accordingly, NDDDB adopted similar approach towards improvement of dairy cattle and buffalo population. Scientific breed improvement programmes like Progeny Testing (PT) and Pedigree Selection (PS) were implemented for improvement of indigenous and crossbred cattle and buffalo breeds of India. Efforts were further strengthened by adopting Genomic Selection (GS) approach for selection of superior animals. NDDDB also continued efforts towards R&D and training on Ovum Pick-Up and In Vitro Embryo Production (OPU-IVEP) and embryo transfer technologies. OPU-IVEP technology can be a game changer for multiplication of superior germplasm, if the

cost of the technology could be reduced. Reduction in the cost and improvement in efficiencies would lead to application of technology on a large scale through adoption of the technology by ordinary dairy farmers.

In addition to breed development efforts in indigenous cattle and buffaloes, NDDDB undertook import of exotic germplasm to meet the demand of dairy farmers owning exotic and crossbred animals and to give impetus to the cross breeding programme being implemented across the country. NDDDB also provided technical assistance to strengthen the artificial insemination network in North Eastern States.



During the year, NDDDB continued to produce and disseminate quality genetics by selecting genetically superior bulls and bull mothers through implementing scientific field-based genetic improvement programmes such as, Progeny Testing and Pedigree Selection and using them to produce genetically superior young male calves.

Genetic Improvement

NDDDB made coordinated and sustained efforts jointly with several government agencies, trusts and dairy cooperatives for accelerating genetic progress in cattle and buffaloes in the country.

During the year, NDDDB continued to produce and disseminate quality genetics by selecting genetically superior bulls and bull mothers through implementing scientific field-based genetic improvement programmes such as, Progeny Testing and Pedigree Selection and using them to produce genetically superior young male calves. Such male calves are then distributed to various semen stations in the country for production of disease-free frozen semen doses. The semen doses thus produced are then distributed through the Artificial Insemination (AI) network, to provide AI services to farmers at their doorstep. Various End Implementing Agencies (EIAs) have been assisted for establishing efficient project monitoring and evaluation systems in the field for generation of authentic, accurate and reliable data to facilitate accurate selection of superior animals and their dissemination to accelerate genetic progress.

Despite COVID-19 pandemic, NDDDB successfully imported superior HF bulls from Germany for distribution to various semen stations in the country.

The Progeny Testing and Pedigree Selection projects initiated under Rashtriya Gokul Mission (RGM) scheme of Govt. of India, were continued during the year and these projects have produced 579 HGM bulls. Despite constraints due to pandemic in the country, the projects

made additional efforts to ensure supply of HGM bulls. Genomic selection in cattle and buffaloes were continued during the year and genomic breeding values of Gir, HF crossbred, Jersey crossbred cattle and Murrah buffaloes were estimated.



Implementation of Genetic Improvement Programmes Under RGM

The Progeny Testing (PT) and Pedigree Selection (PS) programmes

Progeny Testing – Estimating breeding values of bulls based on the performance of their progenies and selecting top among them (Proven bulls) for producing the next generation of bulls

Thrust areas:

- Testing of bulls to assess their genetic worth
- Production of genetically superior male calves

NDDDB along with various implementing agencies, continued to implement 14 PT programmes under (RGM) through 11 EIAs in nine states for three breeds of exotic and crossbred cattle, two breeds of indigenous cattle and two breeds of buffaloes. During the year 2020-21, all PT projects together tested 273 bulls, carried out nearly 0.5 million test AIs and have put 41,853 animals under milk recording. PT projects together produced 527 young HGM

During the year 2020-21, all PT projects together tested 273 bulls, carried out nearly 0.5 million test AIs and have put 41,853 animals under milk recording. PT projects together produced 527 young HGM bulls and made available these bulls to semen stations for production of frozen semen doses.

bulls and made available these bulls to semen stations for production of frozen semen doses. The major thrust has been on selecting bulls based on their breeding values for milk yield after confirming their correct parentage through DNA testing and ensuring negative status for diseases like TB, JD, Brucellosis, IBR, and BVD. Apart from milk yield, breeding values are also estimated for various other important traits like fat, SNF, protein yields, open period, and age at first calving. Besides, service sire conception rates are also estimated regularly under PT projects. Animal

type classification forms an integral part of PT programmes. Giving weightage to type traits in the selection of animals improves the lifetime productivity of animals. Measurement procedures have been standardised for important type traits and an appropriate scale has been developed for CBHF, CBJY, Murrah, and Mehsana breeds. PT Projects which are being implemented under RGM are given in the table below:

Name of the EIA	State	Breed
ABRO	Uttar Pradesh	Murrah
APLDA	Andhra Pradesh	Jersey CB
SAG	Gujarat	Murrah
SAG	Gujarat	HFCB
Mehsana Milk Union	Gujarat	Mehsana
Banas Milk Union	Gujarat	Mehsana
SAG	Gujarat	Gir
HLDB	Haryana	Murrah
HPL & PDB	Himachal Pradesh	Jersey
KLDB	Kerala	HFCB
PLDB	Punjab	Murrah
PLDB	Punjab	Sahiwal
Sri Ganganagar Milk Union	Rajasthan	Sahiwal
TCMPF	Tamil Nadu	Jersey CB



Pedigree Selection – Estimating breeding value of calves based on the performance of their parents and selecting top among them for semen production

Thrust Areas:

- Strengthening of AI infrastructure and popularising AI in the breeding tracts of indigenous breeds
- Performance recording & sensitising farmers in the area on genetic improvement programmes

Farmers in many marginal areas in the country give preference to indigenous breeds because of their certain distinct characteristics such as adaptability to low input systems, heat tolerance, disease resistance, etc. However, the major deterrent remained the lower productivity of a large proportion of indigenous breeds. So, it is important to increase the productivity of animals of such breeds by putting in place genetic improvement programmes. The key aim of Pedigree Selection programmes is to initiate field-based development and conservation efforts in the breeding tracts of various breeds enabling selection of superior animals within the population and then disseminating their genetics to the larger population through building infrastructure for AI delivery. Besides, PS projects attempt to sensitise the participating farmers on the importance of genetic improvement programmes.

Under RGM, 70,015 AIs were carried out, 4,472 animals were put to milk recording and 52 HGM bulls were produced by the PS projects together during 2020-21.



During the year, NDDB continued its efforts towards development of indigenous breeds, through implementation of seven PS projects for breeds viz., Haryana, Kankrej, Tharparkar, Rathi breeds of cattle and Jaffarabadi, Nili-Ravi, Pandharpuri

breeds of buffaloes, through seven EIAs in five states. Under RGM, 70,015 AIs were carried out, 4,472 animals were put to milk recording and 52 HGM bulls were produced by the PS projects together during 2020-21.

PS Projects which are being implemented under RGM are given in the table below:

Name of the EIA	State	Breed
SAG	Gujarat	Jaffarabadi
Banas Milk Union	Gujarat	Kankrej
HLDB	Haryana	Haryana
MLDB	Maharashtra	Pandharpuri
PLDB	Punjab	Nili-Ravi
RLDB	Rajasthan	Tharparkar
URMUL Trust	Rajasthan	Rathi

Genomic Selection - Selection of animals based on genomic breeding values using dense genotype markers covering whole genome

The year remained eventful for the genomic selection activity at NDDB. NDDB continued to strengthen its DNA repository (>75,000 animals) of milk-recorded animals in India so that phenotypes of cattle and buffaloes recorded under PT and PS projects could be used for developing and implementing genomic selection procedures.

The efforts towards Genomic Selection, were continued under National Bovine Genomic Center for Indigenous breeds (NBGC-IB) under RGM scheme. Under the project, Sabarmati Ashram Gaushala, Bidaj (SAG) is developing a genomic selection methodology for cattle and buffaloes with the technical assistance of NDDB. During the financial year, the lab collected samples from 19,116 animals. A total 5,184 cattle and 2,544 buffalo samples were genotyped using customised "INDUSCHIP" and "BUFFCHIP". Beside this, around 280 samples of cattle were genotyped with HD chip. During the year, Genomic Breeding Values of more than 350 bull calves of Gir, Murrah, HF crossbred and Jersey crossbreds were estimated and shared with the PT projects for more accurate selection. Thus for the first time in the country, Genomic Selection was actually applied for selection of animals in the field.

Import of Bulls

To take advantage of the genetic progress made in Dairy advanced countries and to meet the requirement of dairy farmers and give impetus to the existing crossbreeding programme in the country, it is important to introduce new and superior genes by importing the exotic germplasm.

Under the RGM scheme, NDDB on behalf of the Department of Animal Husbandry & Dairying (DAHD), Government of India, imported



5,184

**NUMBER OF CATTLE SAMPLES
GENOTYPED USING CUSTOMISED
INDUSCHIP**

2,544

**NUMBER OF BUFFALO SAMPLES
GENOTYPED USING CUSTOMISED
BUFFCHIP**

a total of 228 purebred Holstein Friesian (HF) bulls from Germany in two lots during October-December, 2020. After successful completion of mandatory quarantine period, the imported bulls were distributed to 37 semen stations across country covering 19 states of India, as per the directions from DAHD, Gol.

Ovum Pick-up and In vitro Embryo Production - An Assisted Reproductive Technology to multiply the elite germplasm at a faster rate

Great impetus has been given for application of Ovum pick-up and In vitro embryo production (OPU-IVEP) technology for faster multiplication of superior germplasm by funding establishment of several facilities across India by DAHD under RGM scheme of Gol and entry of few private players in the field. NDDB's state-of-the-art R&D and training facility on OPU-IVEP continued the stride towards improving efficiency of the technique, reducing cost of

embryos and training manpower to disseminate the technology at a faster pace. NDDB established this facility to standardise the technology in the indigenous breeds of cattle and buffaloes and to create a pool of skilled manpower to implement the technology on a larger scale.

The major achievement for the year has been to establish several pregnancies through transfer of fresh as well as frozen IVF embryos at the institutional farms and providing training and exposure in embryo transfer technique to Veterinarians working with cooperatives.

NDDB also initiated OPU-IVEP work in buffaloes in collaboration with some organised farms. The efforts were successful and the OPU-IVEP protocol in buffaloes has been standardised. The results were encouraging and this would provide further impetus for optimisation of OPU-IVEP in buffaloes.

Since higher cost involved in production and transfer of embryos would remain the biggest challenge in adoption of this technology by the farmers, R&D efforts were made towards reduction of cost through application of alternative media and consumables for OPU-IVEP. This may pave the path for reduction in cost of embryo transfer.

The other way to reduce the cost of production and transfer of embryos is through improving efficiencies at various levels. Therefore, the facility focussed on increasing the efficiency of embryo production through optimisation of the protocol. During the year, a total number of 586 viable embryos were produced from 168 ovum pick-up sessions (3.5 viable embryos/session). One of the HFBC cows produced 89 embryos from just eight OPU sessions, with an average of 11.12 viable embryos per session. A total of 42 pregnancies have been established from 172 fresh embryo transfers and 26 calves have already been born. Efforts were also made to standardise application of sex sorted semen for production of embryos and a total of 37 embryos produced by application of sexed semen.

True benefits of the technology can only be reaped fully if it is used by masses. NDDB's efforts towards creating pool of manpower during the year was thwarted due to COVID-19 pandemic. However, two Veterinarians each from Anand and Banaskantha milk unions were trained on OPU-IVEP-ET technologies. These two milk unions are now exploring possibility to establish field-based OPU and IVEP using Hub and Spoke model wherein, NDDB OPU-IVEP laboratory would serve as hub for embryo production.

The facility is working towards cost reduction, development of human resources to scale-up application of the technology and take the technology to farmers, and also act as a stimulator for technology by dissemination of knowledge and skills through R&D and training activities. While training would remain the focal point, the facility would strive to establish more pregnancies at the farmers' doorsteps.



586

**NUMBER OF VIABLE EMBRYOS
PRODUCED FROM 168 OVUM PICK-
UP SESSIONS IN 2020-21**

TECHNOLOGICAL INTERVENTIONS TO MONITOR FIELD ACTIVITIES

Digitising field supervision reporting system through “Dairy Surveyor” application to capture real-time location-based information.

Performance recording and other related activities under the field-based PT and PS programmes should result in generation of authentic, accurate and reliable data to facilitate selection of superior animals. Therefore, a system to facilitate effective supervision of major activities under PT and PS projects have been rolled out using “Dairy surveyor” application, a GIS-enabled application developed by NDDB.

The app is being used by supervisors of the projects to capture various supervisory activities undertaken by them on a real-time basis with geo-tagging facility. This has helped in establishing a more effective monitoring arrangement due to its real-time report generation, and the project officials are able to monitor the supervision activities more effectively using this application.

Since the visit of evaluation team to project areas was not possible due to pandemic situation, “Dairy surveyor” application was used along with other applications to organise virtual meetings and video calls to carry out the evaluation of PT and PS project being implemented under RGM scheme of Gol.

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Annual Report 2020-21

SCIENTIFIC COLLABORATION AND PUBLICATIONS

Development through collaboration and knowledge sharing

During the year, NDDB entered into research collaborations with various institutions like NIAB, Hyderabad; GBRC, Gandhinagar; BAIF, Urulikanchan; NRC-Meat, Hyderabad; AAU, Anand; Kamdhenu University, Gandhinagar. Besides, NDDB officers were members in the working groups of DNA and Dairy cattle milk recording of the International Committee of Animal Recording (ICAR). Furthermore, NDDB officers facilitated hands-on training programmes on “production and cryopreservation of in vitro embryos” organised jointly by GBRC and Kamdhenu University, Gandhinagar.



Animal Nutrition



26

Sustainable Model for 'Ration Advisories' to Dairy Farmers

Educating milk producers on balanced feeding of their animals plays a pivotal role in making dairying remunerative and sustainable. A new model to deliver the benefits of balanced feeding to dairy farmers was conceived and a pilot was operationalised in Sangli district of Maharashtra.

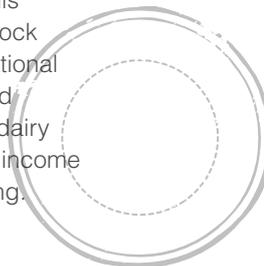
As part of this model, 'Ration Advisories' (RA) are designed, every quarter by qualified animal nutritionists for various categories of animals depending upon their

physiological stage (pregnancy, lactation etc.) and levels of milk production. The prevailing prices of raw materials, fodder as well as their availability in a given region are also considered before framing the RA.

In the pilot, RAs were delivered to dairy farmers by 'Pashusakhis' (village level workers) operating under the aegis of a local Self-Help-Group (SHG). The 'Pashusakhis' were already involved in livestock related activities in their operational areas and the income obtained from the delivery of the RA to dairy farmers was in addition to the income that they were already receiving.

This ensured commitment and continuity for the programme.

Feeding of Total Mixed Ration (TMR) pellets, customised to the season was integral to the RA. A total of 291 animals from 200 farmers have been enrolled under this model. Initial results from this project are encouraging.





291

**NUMBER OF ANIMALS ENROLLED
UNDER RA MODEL BY 200
FARMERS**

The ability to incorporate locally available crop residues/ hay along with concentrate raw materials and feed additives makes the TMR model cost-effective, environment-friendly and nutritious while offering the convenience of pelleted feed to dairy cattle.



Feeding 'Total Mixed Ration' (TMR) Pellets for Improving Productivity and Optimising Production Cost

TMR pellets have the advantage of catering to the nutrient requirements of dairy animals while simultaneously incorporating roughages such as hay or straw. The composition of TMR pellets varies on the physiological stage of the animal; such customisation improves productivity and thereby dairy farm profitability. The ability to incorporate locally available crop residues/hay along with concentrate raw materials and feed additives makes the TMR model cost-effective, environment-friendly and nutritious while offering the convenience of pelleted feed to dairy cattle.

Extensive field studies were conducted in Kolhapur region of Maharashtra on graded Murrah buffaloes, which involved inter alia the supply of customised feed for pregnant animals and early lactation animals along with the adoption of challenge feeding in early lactation animals. Principal parameters

studied were milk productivity and inter-calving periods in experimental group animals vis-à-vis control group animals.

An increase of 19 per cent in milk productivity was observed in animals fed TMR feed as compared to control group animals with commensurate improvement in fat and SNF content in milk. The average inter-calving period reduced by 97 days in animals fed TMR as compared to control group animals.

'Strategic Animal Nutrition Plan' for Customising Dairy Cattle Rations to the Agro-Climatic Zones in Various States

It is well known that there is wide variation in the availability and type of concentrate raw materials, green fodder and crop residues for feeding dairy cattle in different regions of the country. For profitable and sustainable dairy farming, it is imperative that the feeding regimen takes into account these variations.

NDDB has designed and tested the 'Strategic Animal Nutrition Plan' as part of a pilot in Barauni Milk Union in Bihar. Under this plan, farmers were advised to cultivate green fodder appropriate to the soil type, water availability and climatic conditions prevalent in that area.

A combination of Berseem and Oat fodder was advised for the Rabi season during which this study was conducted in combination with mustard oil cake, maize grain, compound cattle feed and area-specific mineral mixture.

An increase in milk yield by 12 per cent in cross-bred cattle (12.1 litres vs. 10.8 litres) has been reported with a simultaneous reduction in feeding cost by 8 per cent. Farmers also reported an increase in daily income by ₹ 52 per animal under this study.



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Feed Supplements for Improving Milk Quality and Mitigating Heat Stress

NDDB has developed 'Samvridhhi' – a feed supplement to address the chronic issue of low milk fat/ SNF in the country. Supplementation of 'Samvridhhi' helps improve milk quality owing to its effect on optimising rumen function, in addition to improving overall digestion and metabolism in dairy animals.

A supplement to mitigate 'Heat Stress' in dairy cattle, particularly during the months of April to September, characterised by high temperatures/relative humidity has also been developed. NDDB has transferred the know-how for production of Samvridhhi/ Sheetvardhak to various Milk Unions/ Federations.

Green Fodder Production Enhancement Through Better Quality and Availability of Fodder Seed

183 quintals of 'Breeder seed' was procured by Seed Processing Plants in the dairy cooperative sector for the production of Foundation Seed/ Truthfully Labelled Seed and onward supply to farmers for the production of green fodder, as compared to 169 quintals in the previous year.

New varieties of fodder seed introduced in the seed multiplication chain comprise; JBSC-1 and UPB-110 for Berseem; OL-1802 and JO-04-315 for Oats as well as CSV 33 MF and CSV 32F for Sorghum. These varieties not only offer higher biomass yields but also have higher resistance to diseases.

During the year, 24,263 quintals of Certified/Truthfully Labelled fodder seed was produced by dairy cooperatives and about 42,076 quintals marketed to dairy farmers.

Nearly 29,000 quintals of fodder seed (8,10,000 minikits) sourced from the National Seeds Corporation was distributed free to dairy farmers in 23 states.

Commercial Silage Production at the Level of the Dairy Cooperative Society (DCS)

The chronic deficit being faced by dairy farmers with respect to green fodder can be addressed to a large extent by encouraging large farmers in the villages to grow fodder crops suited for silage making (such as maize and sorghum) under the 'contract-farming' system. Entrepreneurs can also be encouraged to grow such crops on rented/leased lands and supply the same to the DCS, which in turn can convert them to silage and supply to pouring members during times of need or scarcity. This would create a win-win model for the fodder growing farmer as well as the dairy farmer.

To validate this model, Sharda DCS, Pawarvasti operating under the aegis of the Baramati Milk Union in Maharashtra was supported to take up this activity. A surface silo, measuring 18 × 9 × 1.5 metres, was constructed by the DCS, with a capacity to produce 100 MT in a season and 300 MT of silage annually. Approximately, 150 MT of silage has been produced in this manner at this DCS and this silage was supplied to dairy farmers at a price of ₹ 3.50-5.50 per Kg.

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Animal Health



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Annual Report 2020-21



2,18,088

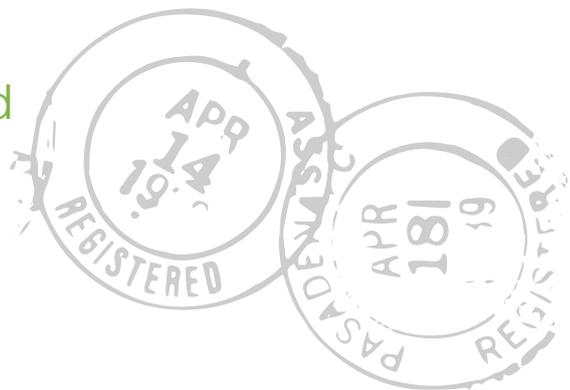
**MILK SAMPLES OF FARMERS
POURING MILK AT THE DCS TESTED
BY CMT IN 2020-21**

NDDB has always been striving for the upliftment of the small and marginal dairy farmers, through better animal health practices. The holistic and cost-effective disease control models being propagated by NDDB help the farmers in augmenting his income significantly by reducing expenses, especially on treatment costs and by improving the productivity of her or his animals. Some of these disease control models also help reduce the use of drugs like antibiotics and thereby its residues in milk, which will reduce the emergence of antimicrobial resistance (AMR), a serious public health issue in both animals and humans.

Consultancy on biosecurity and disease control is also being provided by NDDB on a regular basis to bull production areas and semen stations to ensure production of disease-free semen.

NDDB continued to support the one health model of brucellosis control in 573 villages covering four districts of Gujarat. Besides vaccination, it includes core components like animal identification, proper disposal of placenta and aborted material, awareness creation, disinfection, animal isolation aimed to limit the spread of the disease which are of equal importance as vaccination. As on March 2021, 1,28,245 bovine

There was an average savings of 30 per cent in drug costs and milk unions that have seriously embarked on use of EVM have reduced their medicine purchases, especially antibiotics, to the tune of ₹ 1 million per month.



female calves have been vaccinated and ear-tagged during this fiscal and more than 0.25 million animals have been covered since initiation of the project in April 2013. Most importantly, the much-needed linkage has been created between the animal and human disease by collaborating with a medical institute since this zoonosis remains largely underdiagnosed and seriously impedes the working capacity of the farmers and other animal husbandry personnel. The relief from the disease in farmers affected provides a plausible reason to prevent the disease in their animals. More than 1,000 stakeholders (farmers and animal health personnel) have been screened for brucellosis and 90 patients with symptoms of brucellosis have been treated and cured, bringing them back to good health and improving their working capacity significantly. The awareness levels on brucellosis and necessity of its control have also increased significantly among the farmers in the project areas.

The project is for a period of five years with a total outlay of ₹ 113.68 million with NDDDB contributing ₹ 54.31 million.

NDDDB continued to support - the Mastitis Control Popularisation Project (MCP) - in 23 milk unions and producer companies across

nine States (Kerala, Karnataka, Tamil Nadu, Maharashtra, Gujarat, Punjab, Assam, Andhra Pradesh and Uttar Pradesh). The total outlay of the project is ₹ 260.5 million with NDDDB contributing ₹ 35.6 million. Various parameters namely, sub-clinical mastitis (SCM), antibiotic residues, somatic cell counts (SCC) and bacterial load in milk, bacterial agents responsible for mastitis and antibacterial sensitivity are being monitored in the project areas and appropriate measures are being suggested so as to minimise the use of antibiotics and reduce the possibility of emergence of Antimicrobial Resistance (AMR). A new component to monitor the aflatoxin residues in milk was introduced during this fiscal. Periodic surveys are also being conducted to assess the cost-benefit of the project. A web-based reporting system is being used to capture all the data generated from the project. During 2020-21, a total of 2,18,088 pooled milk samples of the farmers pouring milk at the Dairy Cooperative Society (DCS) were tested initially by California Mastitis Test (CMT) to assess SCM. Further investigation on the positive samples were carried out by testing at the farmers' homestead to identify animals with SCM and to monitor their progress while being provided with an easy oral regimen costing around ₹ 20/- for a 10-day course. A drastic reduction in the

incidence of SCM, and, an average milk yield increase of one litre per day in affected animals have been recorded with this strategy. Documentation of ethno-veterinary medicines (EVM) of several common ailments which reduces milk production, including mastitis, is also being carried out under MCP. Till date, more than five lakh cases intervened by EVM alone have been documented from the project areas of which above 0.168 million are for mastitis alone, with an average cure rate of 80 per cent. Transfer of this EVM knowledge to the farmer has been immensely helpful in reducing treatment costs and antibiotic residues in milk. Under MCP, NDDDB is also encouraging unions to strengthen their supply chain of EVM so that farmers receive good quality preparations at minimal cost. There was an average savings of 30 per cent in drug costs and milk unions that have seriously embarked on use of EVM have reduced their medicine purchases, especially antibiotics, to the tune of ₹ 1 million per month. The total number of cases being reported in such unions have also reduced significantly as more and more farmers prefer to adopt EVM to self-manage common ailments.

Information Network for Animal Productivity & Health

Information Network for Animal Productivity & Health (INAPH) system established by NDDB is presently being used by more than 300 projects across the country for traceability of animals, productivity enhancement, augmenting nutritional availability and better disease management system across India. Department of Animal Husbandry & Dairying (DAHD), Government of India has adopted this system as a National Database and decided its mandatory use by the SIAs (State Implementing Agencies) for implementation of central sector schemes like National Animal Disease Control Programme (NADCP), National Artificial Insemination Programme (NAIP), RGM etc. NDDB has been entrusted to manage INAPH and provide implementation support to the stakeholders in the country.

INAPH is currently being used countrywide to record the vaccinations against Foot and Mouth Disease (FMD) and Brucellosis under the aegis of the National Animal Disease Control Programme (NADCP) and also to record AI under NAIP of Government of India.

For the smooth implementation of NADCP and NAIP-II, a total of 88 training sessions on INAPH have been organised by NDDB covering 3,304 participants from 36 states and UTs. INAPH Helpdesk support system has been developed for effective implementation of INAPH across country.

As on 31st March, 2021, more than 153 million cattle and buffaloes have been registered in INAPH. A total of over 107 million FMD vaccinations from 34 states and UTs and more than 42 million AIs from 36 states, UTs have been captured in INAPH.

In addition to above, INAPH Animal Health module is being extensively used in the Kolhapur milk union as a pilot and 0.257 million transactions have been recorded in the system during the year. The INAPH data captured by this milk union on animal health reveals the occurrence of three major class of ailments of dairy animals viz. udder related (30 per cent), digestion issues (28 per cent) and reproductive problem (10 per cent) which makes the basis for development of control strategy.

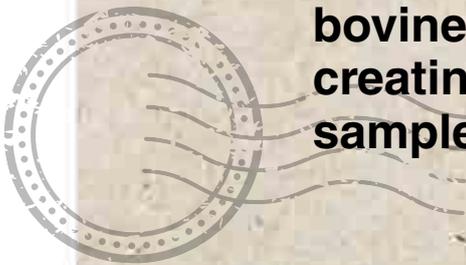
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RESEARCH & DEVELOPMENT

NDDB's Hyderabad-based R&D laboratory is a state-of-the-art bovine disease diagnosis and research facility. The laboratory has adopted quality management system as per international standards (ISO 9001:2015 and ISO/IEC 17025:2017) for ensuring accuracy and reproducibility of the laboratory protocols. Further, competency in testing is assured through participation in international proficiency testing (PT) programme. The laboratory's research programmes are focussed on the development and validation of disease screening assays essential for diagnosis and control of bovine diseases. It is also invested in creating a robust repository of reference samples for major bovine diseases.



Disease Diagnostic Support to Semen Stations and Breed Improvement Projects

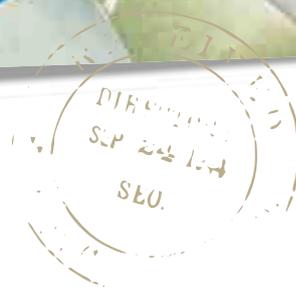
NDDDB's laboratory is recognised by the Department of Animal Husbandry and Dairying (DAHD), Government of India for screening sexually transmitted diseases listed in the compendium of Minimum Standard Protocol (MSP) for the production of bovine frozen semen. The laboratory provides diagnostic support to various semen stations, bull mother farms, and agencies involved in breed improvement viz. progeny testing and pedigree selection projects under Rashtriya Gokul Mission (RGM) and other entities involved in bovine breeding (50 different agencies across 13 states). During the year 2020-21, a total of 59,534 clinical samples (sera, semen and preputial wash) from cattle and buffaloes were screened for various sexually transmitted diseases viz., bovine brucellosis, infectious bovine rhinotracheitis (IBR), bovine virus diarrhoea (BVD), Johne's disease (JD), bovine genital campylobacteriosis (BGC) and bovine trichomonosis as recommended in the MSP. Out of the 16,186 serum samples screened for brucellosis, 3.50 per cent turned positive, whereas 16.47 per cent of total 14,343 samples were recorded positive for IBR. A total of 6,243 cattle and buffaloes were screened for detection of BVD persistently infected (PI) status and 0.07 per cent turned positive. Testing of 562 serum samples for detection of antibodies to *Mycobacterium avium subspecies paratuberculosis* (MAP), the

causative agent of JD, revealed 3.74 per cent positivity. The laboratory also processed 926 and 876 preputial wash samples from bulls for cultural isolation and identification of causative agents of BGC and trichomonosis respectively. However, none of the samples were found positive. Frozen semen doses (FSDs) produced from IBR seropositive bulls were tested for the presence of bovine alphaherpesvirus-1 (BoHV-1) by real-time PCR test. A total of 456 (2.27 per cent) out of 20,041 FSDs from 12 semen stations were recorded positive for presence of BoHV-1. As recommended in the MSP, the semen stations were advised to discard the FSD batches found positive for BoHV-1, preventing their use in artificial insemination.



59,534

NUMBER OF CLINICAL SAMPLES SCREENED FROM CATTLE AND BUFFALOES FOR SEXUALLY TRANSMITTED DISEASE IN 2020-21

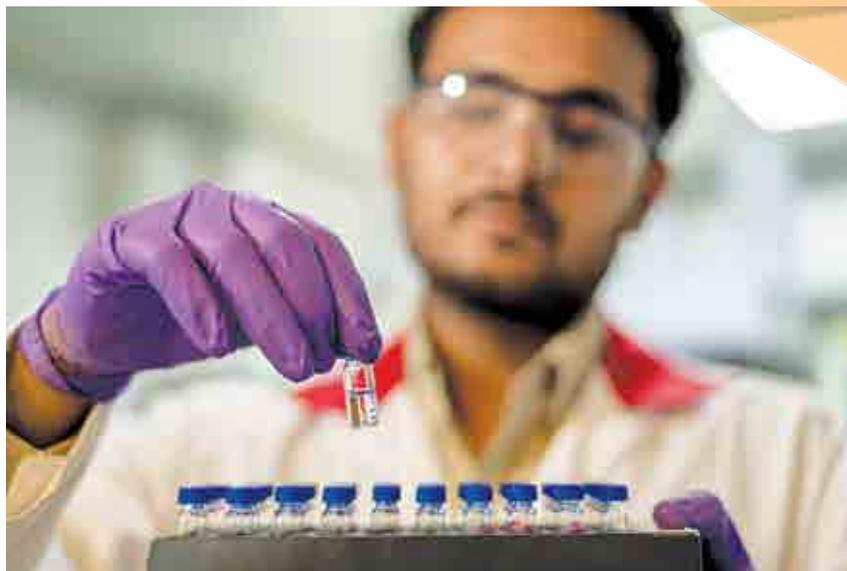


Quality Accreditation and Proficiency Testing

The certification bodies on annual assessment of the Quality Management System (QMS) for disease testing found full conformance to the ISO 9001:2015 and ISO/IEC 17025:2017 standards of the laboratory and extended the accreditation to another term. In addition to diagnostic tests for IBR and Brucellosis, the laboratory participated in the international proficiency testing (PT) programmes for BVD, JD and enzootic bovine leucosis tests offered by the PT provider for veterinary disease testing (Vetgas, APHA, U.K.). The results in the PT programme were in 100 per cent agreement to that of the PT provider confirming the competency of the laboratory and the validity of the test results.

Development and Validation of the BoHV-1 gE (DIVA) ELISA for IBR Diagnosis

A glycoprotein E (gE) specific monoclonal antibody (mAb) and recombinant gE protein of BoHV-1 based ELISA test was developed and validated for diagnosis and differentiation of vaccinated and infected animals (DIVA). The validation assays revealed that the test is highly repeatable and reproducible (co-efficient of variation below 15 per cent). The assay was found to be specific to BoHV-1 and no cross-reaction was observed for sera from animals infected with the other pathogens (BVDV, foot-and-mouth disease virus, bovine leukosis virus and *brucella*). However, the assay did not differentiate the sera of animals infected with the other ruminant alphaherpesviruses viz., BoHV-5 and BuHV-1. The analytical sensitivity of the assay was higher than a commercial gE ELISA kit that is used in the laboratory. The diagnostic sensitivity (dsn) and specificity (dsp) of the assay for detection of IBR infection in animals of known status was 96.98 per cent and 100 per cent respectively. The dsn and dsp of the test for DIVA was above 99 per cent.



Development of mAb Based Solid Phase Competitive ELISA (SPCE) for Foot-and-Mouth Disease Virus (FMDV) Antibody Assay

A mAb based solid phase competitive ELISA (SPCE) assay was developed for the detection of antibodies specific to FMDV serotype-O (FMDV-O) in serum samples of cattle and buffaloes of India. A FMDV pan-specific mAb was used as coating or capture antibody while a FMDV serotype-O specific mAb was used for tracing or detection antibody in the competitive ELISA. The assay was

highly repeatable and reproducible with a good performance score of AUC 0.999 in the ROC analysis. The diagnostic performance of the assay was evaluated with the currently available liquid phase blocking ELISA (LPBE) as gold standard. The assay result of 524 serum samples revealed dsn and dsp of 91.8 per cent and 100 per cent respectively with good agreement (Kappa value 0.867) between the two assays (in-house SPCE and LPBE). The results indicate the potential of the mAb based SPCE for application in large scale routine screening of FMD post-vaccination sera.

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Development of Internal Positive Control (Xeno DNA) for IBR Real-Time PCR Assay

Real-time PCR assays are highly sensitive and are extensively used for the detection of infectious agents. However, a false negative result may occur due to presence of the PCR inhibitors in the sample. Incorporation of non-competing exogenous DNA molecules and corresponding pair of primers and probe for its detection in the real-time PCR mix can detect the presence of PCR inhibitors in the samples causing false negative results. The laboratory has designed 126 base pair exogenous DNA fragment with no homology with known sequences and cloned it into a vector plasmid for continual propagation, which can be used as internal control (IC) in the real-time PCR. A duplex real-time PCR assay has been developed for simultaneous detection of the target gene (gB) for screening of BoHV-1 in FSD and the internal control (IC). Validation studies indicated that the duplex assay was highly reproducible with no significant difference in the test results when compared with that of the currently used uniplex assay of BoHV-1. This IC has the potential for inclusion in the real-time PCR assays for the detection of other infectious agents also.

Use of Targeted Next Generation Sequencing for Simultaneous Detection of Multiple Bovine Pathogens

The scope of simultaneous detection of multiple agents through molecular techniques such as PCR or real-time PCR is limited. The advent of massively parallel or next generation sequencing (NGS) techniques have enabled profiling the organisms present in complex milieu. Targeted sequencing is one such NGS techniques where multiple targets can be probed simultaneously in a sample. The laboratory developed and optimised targeted NGS methodology for detection of as high as 28 bovine pathogens (16 bacteria, 06 viruses,

03 protozoan, and mycoplasma) simultaneously from a given bovine clinical specimen. Preliminary studies indicate that multiple bovine pathogens, viz., *Brucella abortus*, *BoHV-1*, *Staphylococcus aureus*, *Klebsiella*, *E. coli*, *Streptococcus agalactiae* present in bovine clinical samples such as bovine placenta and mastitis milk samples could be efficiently detected by this targeted NGS approach.

Isolation of Lumpy Skin Disease (LSD) Virus in Cell Culture

The laboratory investigated suspected LSD outbreak in dairy herd located in Telangana. The outbreak was confirmed by PCR assay (targeting the p32 gene using primers prescribed by OIE) and real-time PCR assay (targeting EEV glycoprotein gene). Two viruses (one each in MDBK and OA3T cell line) were isolated from tissue scabs of infected cattle which were further confirmed by PCR amplification of multiple genes (p32, EEV, CpRPO30, fusion protein and GPCR) of LSD virus.

Mastitis and AMR

The laboratory continued profiling of mastitis associated organisms from clinical mastitis and subclinical mastitis cases and nearly 700 samples from 11 states of India have been processed. *Staphylococcus aureus* (26 per cent) was found to be the most prevalent agent followed by *Streptococcus* species (15 per cent), *Enterococcus* species (14 per cent), *Escherichia coli* (6 per cent) and *Klebsiella* species (6 per cent). The AMR profile of these isolates were determined by phenotypic (micro-dilution) and genotypic (antibiotic resistance genes by PCR) methods. Multidrug resistance (non-susceptibility to more than one class of antibiotics) was recorded in 41 per cent, 18 per cent, 16 per cent and 10 per cent of *Klebsiella* sp, *S. aureus*, *S. agalactiae* and *E. coli* isolates respectively.

The antibiotic susceptibility of the organisms varied against different classes of antibiotics with high percentage of resistance recorded towards penicillin's (12 -16 per cent) group, Tetracycline (6-75 per cent) and Aminoglycosides (3-7 per cent) groups. Further, more than 90 per cent of *Staphylococcus aureus*, and *E. coli*, 48 per cent of *S. agalactiae* and 52 per cent of *Klebsiella* sp have the genetic determinants required for biofilm formation. Virulence typing and phylogenetic characterisation of the isolates were taken up to study the importance of these mastitis causing isolates from human health perspective. The preliminary results suggest only 2 per cent of the *S. aureus* isolates belonged to community acquired *S. aureus* (CA-MRSA) category. Similarly, only 5 per cent of the *E. coli* belonged to phylogroup B2, generally associated with urinary tract infection in human. However, none of the *Klebsiella* isolates belonged to highly virulent pathogenic serotypes viz. K1, K2, K5, K20, K54, K57. Based on the virulence typing, biofilm formation ability and other molecular characterisation results, three strains each of *S. aureus*, *E. coli* and *S. agalactiae* have been enlisted as candidate vaccine strains for development of much-needed bovine mastitis vaccine.

Animal Nutrition



Development of Cost-Effective 'Toxin Binders' for Addressing the Problem of Aflatoxin M1 in Milk

The presence of the contaminant Aflatoxin M1 in milk is a cause for concern. It is well-known that the source of Aflatoxin M1 in milk is the presence of Aflatoxin B1 in feed and fodder. The use of appropriate toxin binders in feed is a proven method to bind the released toxins in the digestive tract of animals and minimise their excretion in milk.

Studies are underway with a wide range of toxin binders to determine their efficacy as well as cost effectiveness when incorporated at recommended rates in rations of milking animals. Simultaneously, 'quality control' procedures are being standardised for key ingredients contained in these toxin binders.

A Comprehensive Feeding Cum Management Approach Towards Mitigation of Enteric Methane Emissions from Dairy Cattle

Methane emitted by ruminants is one of the potent greenhouse gases (GHG) contributing to climate change. Rations which are either excess or deficit in energy, protein, minerals and vitamins relative to animals' requirements result in higher enteric methane emissions per Kg of milk produced.

Feeding of rations designed to supply the right quantum of energy, protein, critical minerals and vitamins to rumen microbes helps to optimise efficiency of rumen fermentation and lowers methane emissions. When this feeding system is combined with appropriate manure management

strategies, a reduction in Carbon Footprint of milk production by approximately 25 per cent is feasible.

To validate the same, a field study has been initiated in Anand district wherein lactating crossbred cows are being fed balanced ration which

inter alia comprises TMR pellets. Recording of baseline methane emission of all animals under the study has been completed using the internationally recognised Sulphur hexafluoride (SF6) tracer technique.

A study was initiated in five villages of Anand district to determine the effect of feeding 'Fertility Feed' to lactating crossbred cows with a history of 5 to 7 failed artificial inseminations (AI). Per-rectal examination was conducted to exclude cows with infertility caused due to anatomical defects, infections and hormonal imbalances.

Results of the study indicated that cows fed 'Fertility Feed' at the recommended levels, for a sufficient time duration, conceived successfully and the average number of AIs per conception decreased from 6.0 to 1.5. Thus 'Fertility Feed' has the potential to significantly improve reproductive performance of dairy animals under field conditions.



Nutritional Management of Fertility in Dairy Animals

Poor fertility in dairy animals owing to a nutritional aetiology is quite rampant. Estimates indicate that about 40 per cent of the cases of anoestrus and repeat breeding encountered in the field can be traced to poor nutrition. Deficiency of critical trace minerals and vitamins coupled with imbalance of energy and protein have been identified as the principal factors.

Keeping this in view, a specialised 'Fertility Feed' has been designed to supply specific nutrients required for optimum reproduction in dairy cattle and buffaloes.

Study of Bovine Urine as a Bio-pesticide in Fodder Crop Production

Farmers often apply high dosage of pesticides in crop cultivation which causes health hazards to both humans and animals. Pesticide residues can also be transferred to milk via contaminated fodder.

Therefore, the use of bio-pesticides is increasingly gaining traction. Bovine urine has been reported to have 'cidal' effects on the pests of many forage crops and could minimise the usage of chemical pesticides in fodder crop production.

A scientific study was taken up in Vadodara and Anand districts of Gujarat to evaluate the effect of the usage of bovine urine against 'leaf-eating' and 'sucking' pests in fodder crops such as Moringa, Sorghum and Maize. The bovine urine was used either alone or in combination with neem oil during the course of this study.

Results showed that the combination of 75 per cent bovine urine (obtained from buffaloes/crossbred cows/indigenous cows) with Neem Oil @ 1 per cent concentration was the most effective in the control of the leaf-eating and sucking pests in the above mentioned fodder crops.

Establishment of 'Seed Testing Laboratory'

A 'Seed Testing Laboratory' was commissioned to test the quality of various types of fodder seed being supplied to dairy farmers.

In this laboratory, germination percentage as well as the purity of breeder seed collected from various seed plants are tested. Based on the test results seed plants are guided to ensure quality.

From the samples tested, average seed germination was 80 per cent for Moringa and 85 per cent for Oats breeder seed.

Moringa Varietal and Spacing Studies

The quantity of biomass produced by a fodder crop is crucial for the sustainability of fodder farming. In the case of Moringa fodder, various varieties of Moringa have been released by research agencies in different parts of India.

A study was carried out to shortlist those varieties with maximum biomass yields in coordination with Mysuru Milk Union, Karnataka. The biomass production potential of 10 varieties of Moringa was evaluated and it was found that PKM-1 variety (62.46 t/ha), Bhagya variety (58.30 t/ha) and Mysore Local variety (58.21 t/ha) were superior to the rest.

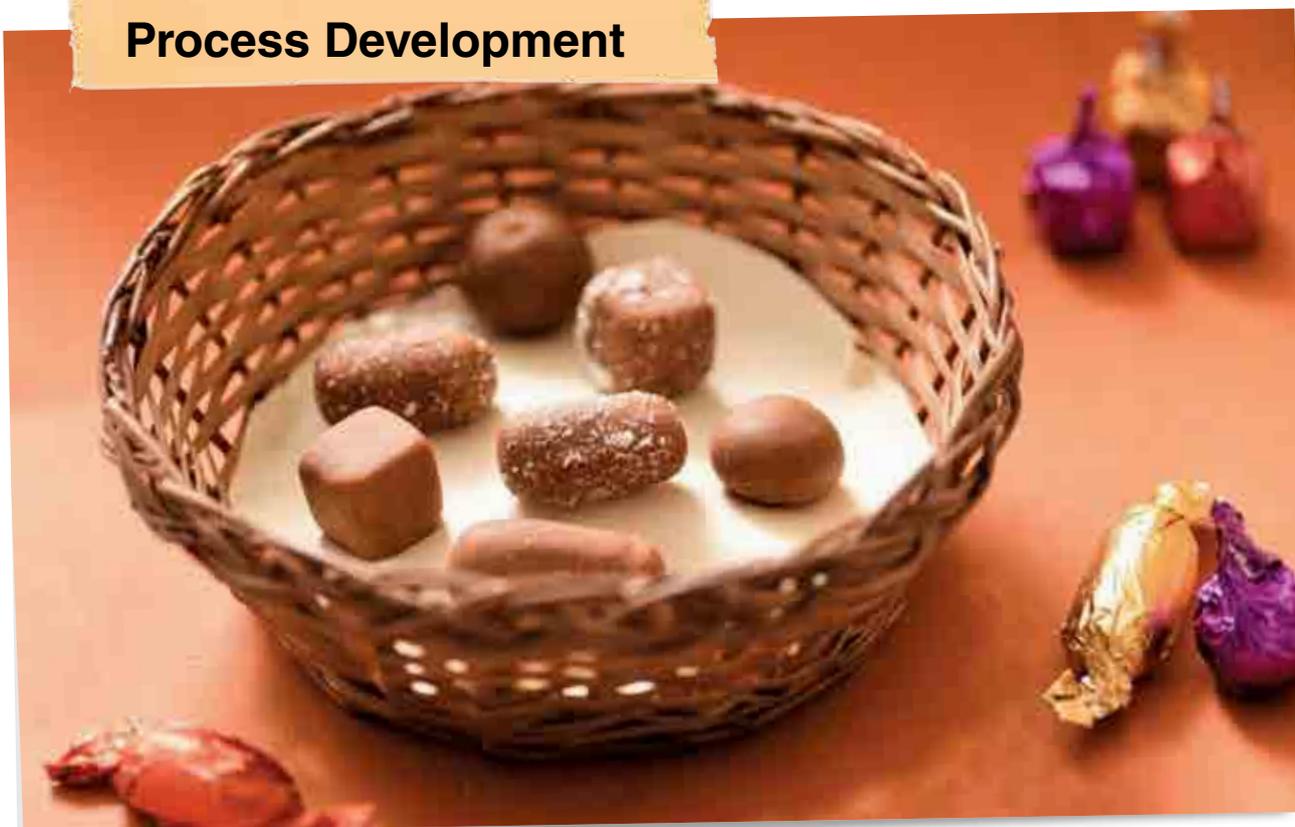


76.73_{MT/HA}

MAXIMUM BIOMASS YIELD
OBTAINED FROM A SPACING
OF 15X15 CM

To determine the ideal distance of sowing of Moringa fodder crop for maximising biomass production, studies with PKM-1 variety were carried out at four different spacings viz. 30×10, 30×30, 15×15 and 22.5×22.5 cm distance. It was found that the maximum biomass yield - 76.73 MT/ha - was obtained at a spacing of 15×15 cm.

Product and Process Development



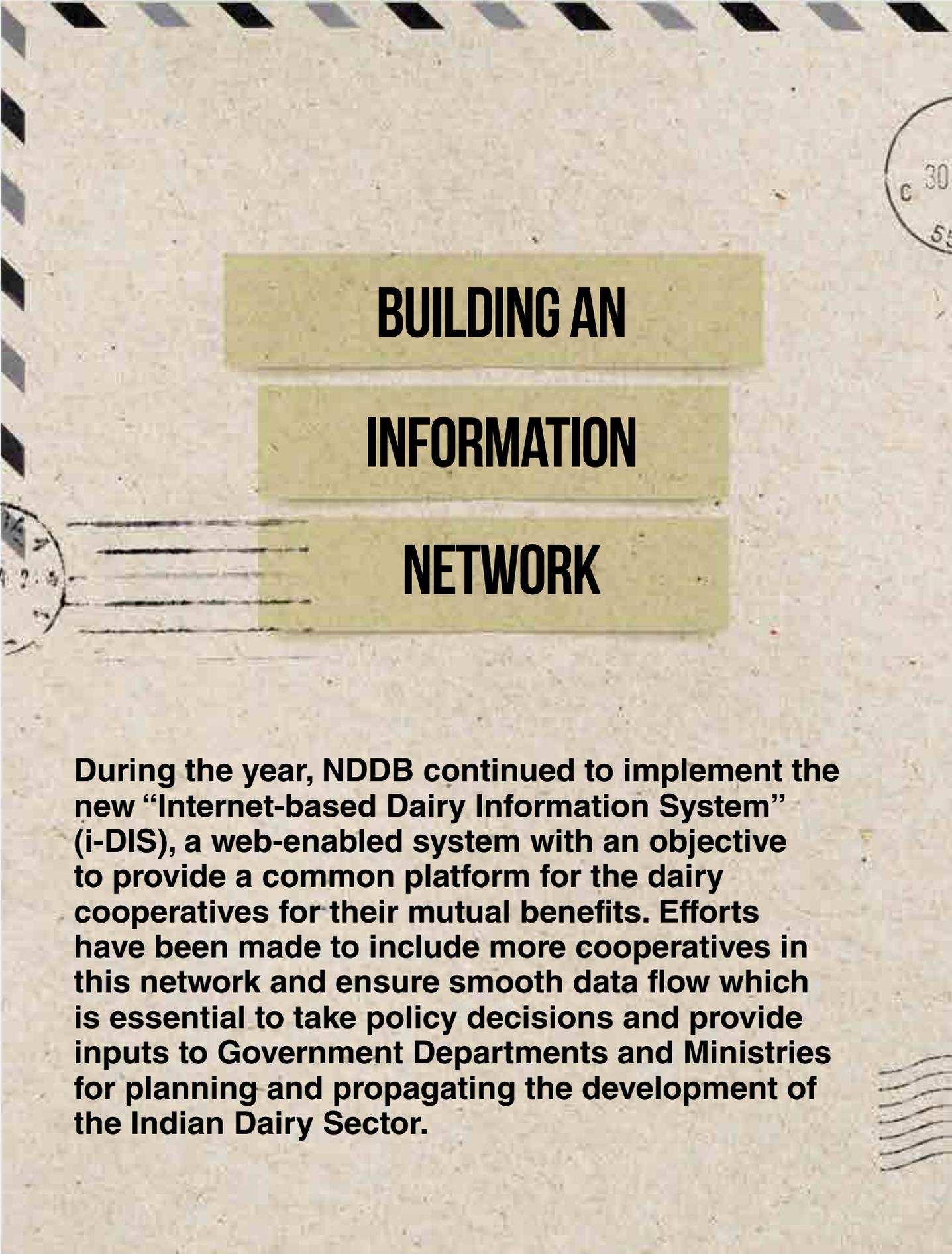
NDDB continued Research and Development activities to support dairy cooperatives by developing new dairy products and processes to facilitate diversification of product portfolio and value addition to existing products. A fermented cream fruit-based spread with the goodness of dairy fermentation and phytonutrients from fruits was developed during the year. It is a convenient and ready-to-use product providing healthier alternative to many spreads available in market.

A dairy-rich energy bar, an instant energy food, with the goodness of milk solids, dried fruits, and herbs was also developed. A unique frozen dairy-based snack, concentrated and fried milk with a rich flavour of milk, cinnamon and vanilla was formulated.

NDDB has been working on the development of dairy-based beverages. Carbonated buttermilk with fruit juice developed this year has goodness of milk solids and fruit and its carbonation imparts superior sensory attributes. Another beverage, carrot lassi, aims at harnessing benefits of increased carotene content which is a potent natural antioxidant as well as precursor for vitamin A. Herbal chaach containing commonly used spices and Triphala powder was standardised. Chaach is digestive and a good hydrant while Triphala is helpful in relieving constipation.

Full replacement of sugar with healthier alternative - honey - was achieved in Kulfi, Peda and Kalakand while replacement at lesser extents was feasible in Yoghurt, Sandesh and Shrikhand.

In continuation of our efforts to develop ready-to-use starter cultures (RUCs), low-cost growth media were designed to support large-scale commercial cultivation. The process of freeze-drying was further standardised to reduce the overall run hours by around half, without compromising the survival and activity of the culture. Multi-strain RUCs for curd were formulated to obtain desired technological attributes. NDDB continued to support dairy cooperatives by providing freeze-dried vials of starter cultures to Mother Dairy, Pilkhwa and Balaji Dairy, Tirupati.



BUILDING AN

INFORMATION

NETWORK

During the year, NDDDB continued to implement the new “Internet-based Dairy Information System” (i-DIS), a web-enabled system with an objective to provide a common platform for the dairy cooperatives for their mutual benefits. Efforts have been made to include more cooperatives in this network and ensure smooth data flow which is essential to take policy decisions and provide inputs to Government Departments and Ministries for planning and propagating the development of the Indian Dairy Sector.

Information Building

NDDB continued to monitor procurement and sales data on a daily basis and provided critical inputs to the Government, even during the pandemic, to ensure uninterrupted milk collection from the millions of milk producers and regular milk supplies to the consumers. Each State had its own different set of issues due to the unprecedented lockdown, which was collated and conveyed to the Government to ensure the operations of the cooperatives were not hampered and the livelihood of milk producers safeguarded.

National Programme for Dairy Development

National Programme for Dairy Development (NPDD) – a Central Sector Scheme of Government of India provides financial assistance for various dairy development activities to the Milk Unions and Dairy Federations in the country. The cooperative milk unions are required to submit a project proposal along with baseline report consisting of details on milk production, productivity of animals, procurement, processing infrastructure and marketing based on primary sample survey. Under this pretext, NDDB conducted baseline surveys to create baseline indicators on the above parameters for monitoring and evaluation and also prepared DPRs for submission to GoI. This year, NDDB conducted baseline survey in Leh and Kargil districts at the request of the Government of Ladakh.

Dairy Surveyor Application

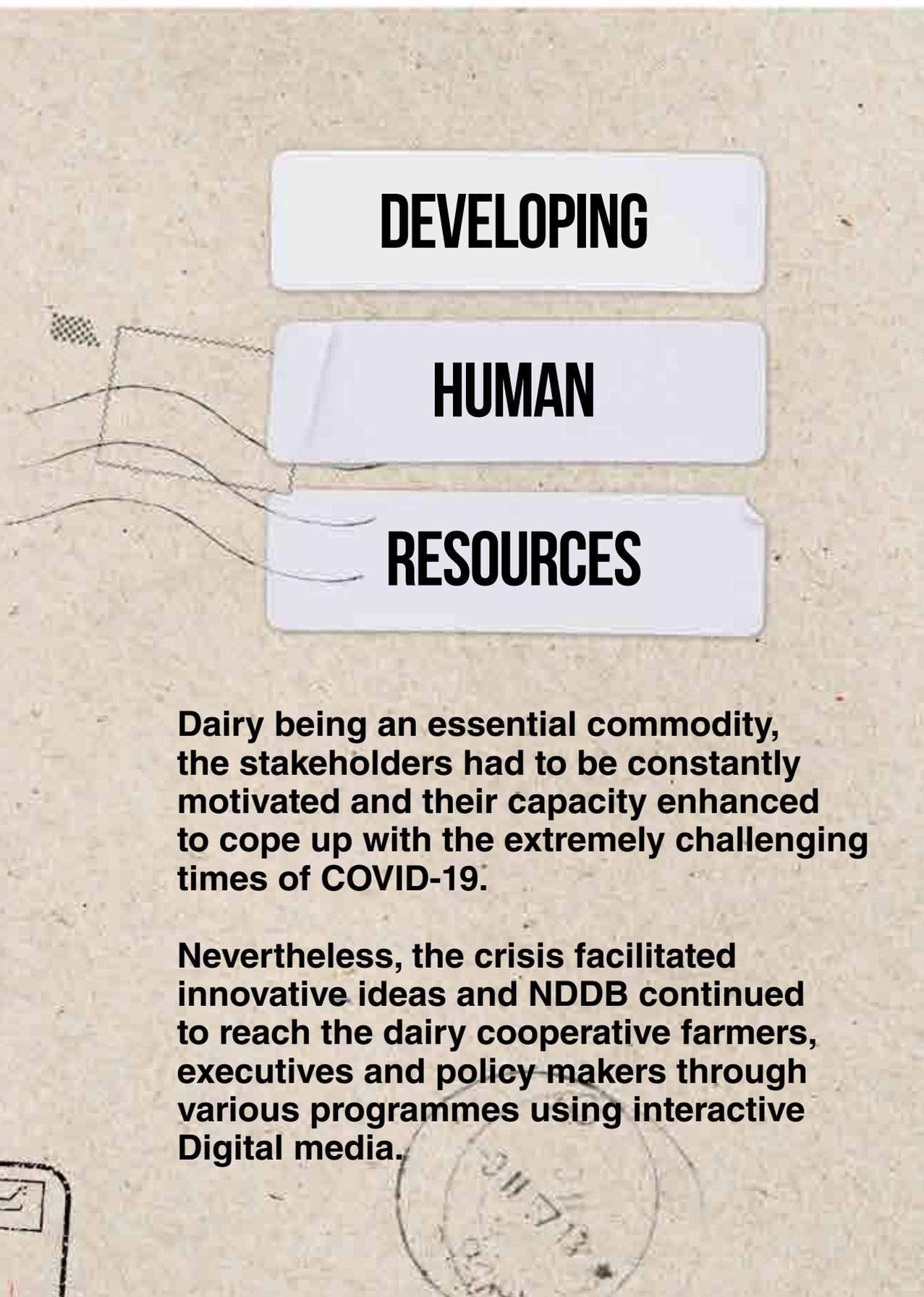
Followed by launch of dairy surveyor application, NDDB organised a national webinar to propagate its features and utilities among the milk unions/federations and producer companies. 94 Milk Unions/Federations and Producer Companies across the country expressed their interest to implement Dairy Surveyor application. NDDB conducted an orientation programme with each institution about usage of the application and GIS server for geo-spatial analyses of collected data.

COLLABORATIVE STUDY WITH IFCN

A study on Dairy Farm Economics for 10 typical dairy farms in five regions (North, East, West, South and North-East), two each in each region covering Assam, Gujarat, Karnataka, Uttar Pradesh and Odisha have been undertaken in collaboration with the International Farm Comparison Network (IFCN), Germany.

The third round in the series was undertaken in 2019-20 and was observed that the average cost of milk production was ₹ 23.6 per Kg of SCM (Solid Corrected Milk: 4 per cent fat & 3.3 per cent protein) and the average realisation was ₹ 33.8 per Kg. Of the total cost of milk production, the out-of-pocket expense accounted for about two-thirds.





DEVELOPING

HUMAN

RESOURCES

Dairy being an essential commodity, the stakeholders had to be constantly motivated and their capacity enhanced to cope up with the extremely challenging times of COVID-19.

Nevertheless, the crisis facilitated innovative ideas and NDDDB continued to reach the dairy cooperative farmers, executives and policy makers through various programmes using interactive Digital media.



During the digital sessions, it was observed that many participants, especially women continued listening to the experts, while attending to daily household chores. This proved the fact that learning at one's own convenient time and space should be the new method of learning.

Thus, all the sessions on Scientific Dairy Animal Management sessions were later uploaded on NDDDB's YouTube Channel. The channel received overwhelming viewership. The year saw a paradigm shift where the focus of the Capacity Building effort was the journey of the learners from being 'Captive Audience' to 'Self Propelled learner'.

Digital Sessions, under the flagship of NDDDB Samvad, have been conducted in the areas like Dairy Animal Management, Solution Oriented subjects, Quality Assurance, Productivity Enhancement, Information & Communications Technology, etc.

Need-based programmes were designed for the executives of dairy sector and series of programmes on "Marketing" and "Self Development and Motivation" were organised.

The Endline survey under External Monitoring & Evaluation Study of NDP I was conducted by Development & Research Services Private Limited. The study revealed that 'Radio' accounts for 63 per cent of all useful sources on dairy-related information. Thus, to reach out to the hinterlands of Marathwada and Vidarbha, NDDDB with the resources of Prasar Bharti aired 15 episodes on radio, under NDDDB Radio Samvad series. The series, developed especially for the Vidarbha and Marathwada region, presented subjects on scientific dairy animal management in the form of drama and is estimated to have reached about 2 lakh farmers in the region.

Moreover, NDDDB reached 3,02,202 participants through interactive learning processes, YouTube channel and radio, in eight regional languages.

The year saw a paradigm shift where the focus of the Capacity Building effort was the journey of the learners from being 'Captive Audience' to 'Self Propelled learner'.

Focus of NDDDB's Capacity Building has always been holistic development of the learner. As the new dimension of distance learning through digital media was added, a robust learning ecosystem was evolved and standardised through its training centres. To complete the learning loop, feedback is sought after the programme which adds value to the further programmes. The queries received from viewers after the programme are also attended to and answers are posted in the Dairy Knowledge Portal. To ensure continued handholding, statewise WhatsApp groups have been created and this platform is utilised for sharing new developments in dairy sector, learning materials and information related to the sector.

For the third consecutive year, International Training on Dairy Development through Cooperative Business Model was conducted in coordination with Centre for International Cooperation & Training in Agricultural Banking (CICTAB), Pune from SAARC countries where cooperative and rural banking personnel from Bhutan, Nepal and Sri Lanka participated. This year, the programme was conducted on the digital platform.

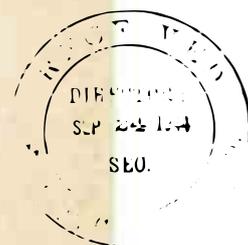
Apart from the digital platform, in-situ and conventional training programmes were also conducted, while following all the required COVID-19 guidelines, for 752 producers, board members and executives.



Training Programmes Conducted During 2020-21

A. Training on Digital Media

Sr. No.	Subject area	No. of programmes	No. of participants
1	National Animal Disease Control & National Artificial Insemination Programme	55	2,763
2	Information and Communication Technology	29	375
3	Sectoral Analysis and Studies	2	2,064
4	Dairy Cooperative Management and Governance	8	1,281
5	Milk Marketing	8	4,377
6	Self-Management and Work Effectiveness	2	1,144
7	Scientific Dairy Animal Management and Productivity Enhancement	71	52,197
8	Clean Milk Production, Dairy Plant Management and Quality Assurance	29	2,386
9	Livelihood Enhancement through Dairy and other Innovations	8	1,084
10	Other Contemporary Subjects	8	34,471
11	International Programme	2	60
12	NDDDB Radio Samvad Series (Vidarbha and Marathwada)	15	2,00,000
Total		237	3,02,202



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B. Conventional/In Situ Training Programmes

Sr. No.	Subject area	No. of programmes	No. of participants
1	Cooperative Services	8	204
2	Training for Innovations	3	73
3	Productivity Enhancement	6	248
4	Quality Assurance	5	112
5	Information & Communications Technology	4	100
6	Skill Enhancement Programme for Dairy Cooperative Services Consultants	1	15
Total		27	752
Grand Total (Digital+Conventional/in Situ) (A+B)		264	3,02,954

Manpower Development

COVID-19 came as a huge challenge during 2020-21 and required a number of steps to be taken for safety and welfare of human resources in the organisation. Due to unprecedented nature of the pandemic, regular communication was done with the employees on steps to be taken for their safety and their family. Employees were regularly updated about guidelines issued by Ministry of Home Affairs, Government of India and all efforts were made to keep them informed about the initiatives and developments. Important initiatives like work from home, staggered work timings, roster system for working, provision of quarantine leave, provision of hostel facility for isolation of employees and their family members testing COVID positive and circulation of posters and information on safety measures to protect from COVID-19 were undertaken for safety of employees.

HRD Initiatives for NDDB Employees

Need-based training on Construction Safety Management, Business Writing Essentials and Train the Trainers were organised during the year. Further, employees were sponsored to attend online training programmes. An induction programme for eight new recruits was also conducted during the year. In all, 128 training nominations were processed during the year. With the focus on organisational capacity building, 49 officers undergoing NDDB's Future Leadership Development Programme continued to work on assignments. During the year, NDDB also facilitated internships for 16 students from various institutions to help them gain valuable on-the-job learning as a part of their course curriculum.

Initiative for Training of Induction Stage and Mid-Career Officers from Public Sector Undertakings and Public Sector Banks

At the initiative of the Central Vigilance Commission (CVC), NDDB developed modules for induction stage and mid-career officers of Public Sector Undertakings and Public Sector Banks focussed on attitudinal change and sensitisation to rural life. As a part of the initiative, a team of three officials constituted by the CVC had visited NDDB for discussion on the modules. NDDB also facilitated visit of officials from other PSUs/ PSBs for discussion on facilitation of the above training programmes.

Sponsorship of Officers for Post Graduate Diploma in Rural Management

NDDB continued to support the initiative for professional development of officers from Dairy Cooperatives and Producer Institutions through their sponsorship to 15 months Executive Post Graduate Diploma in Rural Management (PGDMX (R)) at the Institute of Rural Management, Anand. In all 21 officers from designated organisations were sponsored to the above programme during the year.

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Conventional/in Situ Training Programmes

Name of the Programme	No. of Programmes	Nominations	
		Total	SC/ST
Construction Safety Management	3	64	10
Business Writing Skills	1	20	6
Training of Trainers	1	23	5
Other Programmes (employees sponsored at training programmes at outside institutions)	-	21	1
Total	5	128	22



WORLD'S
PANAMA-PACIFIC
EXPOSITION
SAN FRANCISCO

ENGINEERING PROJECTS

NDDDB supports milk unions and federations by providing technical and consultancy services for the expansion of dairy and cattle feed infrastructure. Three projects were completed during the year. These included fully automated 800 TLPD Liquid Milk Plant & 30 TPD Powder Plant at Ajmer (Rajasthan), 100 TLPD Automated Dairy Plant at Sagar (Madhya Pradesh), and 5 million doses per annum Frozen Semen Station at Purnea (Bihar).

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NDDB maintained its emphasis on providing energy-efficient and state-of-the-art technologies for setting up dairy and cattle feed plants for milk unions and federations. Studies on infrastructure of dairy plants are being carried out for recommendations to upgrade facilities for better operational efficiency of existing plants.

Project Proposals of eight milk unions at an estimated cost of ₹ 15,310 million were technically appraised and cleared under DIDF (Dairy Infrastructure Development Fund) while seven proposals from various state federations and milk unions were appraised under NPDD having cumulative estimated cost of ₹ 1,460 million.

MAJOR PROJECTS EXECUTED

800 TLPD Liquid Milk Plant and 30 TPD Powder Plant at Ajmer, Rajasthan

A state-of-the-art Liquid Milk Plant and 30 TPD Powder Plant has been established at Ajmer (Rajasthan) for Ajmer Cooperative Milk Union. The fully Automated Liquid Milk Plant, Milk Product and Powder Plant along with packaging facility was commissioned during August 2020 to October 2020. The plant was inaugurated on 18th December, 2020. The product manufacturing range consists of Liquid Milk (4 LLPD), Butter Milk (50 TLPD), Lassi (5 TLPD), Table Butter (5 MTPD), Ghee (30 MTPD), Ice Cream (5 TLPD), Curd (5 MTPD), Shrikhand (2 MTPD) and Flavoured Milk (5 TLPD). The Ajmer Dairy Plant complies with the standards stipulated by Indian Green Building Council (IGBC) and is the first Green Dairy processing plant in the country.

100 TLPD Milk Processing and Packing Plant at Sagar, Madhya Pradesh

NDDB has set up an Automated Dairy Plant in the hinterlands of Madhya Pradesh at Sagar, Bundelkhand, having capacity of 100 TLPD. The Sagar Dairy is the first automated milk processing plant in the state of Madhya Pradesh. The Plant was commissioned & inaugurated on 30th January 2021.

Frozen Semen Station at Purnea, Bihar

NDDB has established a Frozen Semen Station (FSS) at Purnea, Bihar with total fund assistance from GoI under RGM. The semen station has a capacity of five million doses per annum. The FSS Purnea was inaugurated virtually by the Hon'ble Prime Minister of India on 10th September, 2020. The frozen semen station in Purnea is the first state-of-the-art semen production centre in the country.

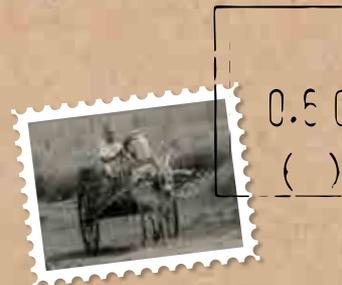
Pro Environmental Activities (Green Energy Initiations)

Concentrated Solar Thermal (CST):

Two CST projects, Uppoor Dairy, Udupi and Katraj Dairy, Pune, have been commissioned during the year. NDDB has installed & commissioned 29 Lakh kcal/day capacity CST system for hot water generation, at these locations.

**29 LAKH
KCAL/DAY**

**CAPACITY OF CST SYSTEM
INSTALLED BY NDDB FOR HOT
WATER GENERATION**



Project Proposals of eight milk unions at an estimated cost of ₹ 15, 310 million were technically appraised and cleared under DIDF (Dairy Infrastructure Development Fund) while seven proposals from various state federations and milk unions were appraised under NPDD having cumulative estimated cost of ₹ 1,460 million.

Solar Photovoltaic (PV) System:

A 200 KWp Solar PV system has been installed at Frozen Semen station Purnea, Bihar. NDDB has also appraised a detailed project report for installation of 165 KWp Solar PV system at new Dairy at Sinner, Maharashtra to reduce dependence on grid power.



200 KW_p

**CAPACITY OF SOLAR PV SYSTEM
INSTALLED BY NDDB AT FSS PURNEA**

As part of Indo German Cooperation, M/s KfW bank, Germany in association with NDDB conducted feasibility study of Solar Energy Generation for dairy processing across the country. The solar energy application areas identified are Village Collection Centres (VCC), Bulk Milk Coolers (BMC), Milk Chilling Centres (MCC) and the Milk Processing plants. The report prepared is in final stage of discussions.

Bio-Safe Laboratories

NDDB provides consultancy services in conceptualising, planning & execution of Biosafety Laboratories (BSL2 & BSL3, BSL4), clean rooms, animal testing facilities, QA-QC Labs, Bio-Pharma units, vaccine manufacturing facilities etc.

The major Biosafety and special projects undertaken by NDDB during 2020-21 are:

- Setting up a new BSL3 laboratory with Small Animal testing facility (LATU) at Tamil Nadu Veterinary & Animal Sciences University (TANUVAS), Chennai. The facility has been completed and commissioning is in progress.

- Anthrax Spore Vaccine Production, Blending and Filling facility with GMP standard and QA/QC lab (GLP standard), and small animal testing facility at Institute of Veterinary Preventive Medicine Ranipet, Tamil Nadu for the Department of Animal Husbandry & Veterinary Services, Government of Tamil Nadu.
- Setting up ET/IVF Laboratories with associated infrastructure at seven Central Cattle Breeding Farms (CCBF) across the country for DAHD, GoI located at Hessarghatta, Alamadhi, Dhamrod, Suratgarh, Andeshnagar, Chiplima and Sunabeda.

Project	Capacity	Location
Northern Region		
Aseptic Packing Station	200 TLPD	Bassi Pathana, Punjab
Liquid Milk Plant & Butter Plant	900 TLPD LMP & 10 TPD Butter	Ludhiana, Punjab
Fermented Product Plant	200 TLPD	Jalandhar, Punjab
Bypass Protein Cattle Feed Plant	50 MTPD	Ghania Ke Banger, Punjab
Western Region		
New Dairy Plant	500 TLPD	Bhilwara, Rajasthan
New Product Plant		Jalgaon, Maharashtra
Establishment of New ETP Plant (Phase I) and Strengthening and Modification of Existing ETP Plant	20 LLPD	Himmatnagar, Gujarat
Central Region		
Automated Dairy Plant Expansion	Additional Civil Works – Phase II	Sagar, Madhya Pradesh
Southern Region		
Ice Cream Plant	30 TLPD	Madurai, Tamil Nadu
Cattle Feed Plant Expansion	150 MTPD to 300 MTPD	Erode, Tamil Nadu
Automated Dairy Plant Expansion, New Aseptic Packed Milk & Ice Cream Plant	500 TLPD to 800 TLPD, 100 TLPD & 5 TLPD	Hyderabad, Telangana
Anthrax Spore Vaccine Production Facility	GMP – 70 lakh doses/ annum	IVPM, Ranipet, Tamil Nadu
QA & QC Lab and small animal testing facility (BSL3)		IVPM, Ranipet, Tamil Nadu
GMP Warehouse	(Additional Works) – PH II	IVPM, Ranipet, Tamil Nadu
Eastern Region		
Automated Dairy and Milk Powder Plant	500 TLPD & 20 TPD	Arilo-Govindpur, Odisha
Indigenous Milk Product Plant	207 TLPD	Barauni, Bihar
Dairy Plant	50 TLPD	Deogarh, Jharkhand
Dairy Plant	50 TLPD	Sahebgunj, Jharkhand
Dairy Plant	50 TLPD	Palamu, Jharkhand
Expansion of Liquid Milk Plant	60 TLPD to 150 TLPD	Guwahati, Assam
Cattle Feed Plant	50 MTPD Bypass Protein & 12 MTPD Mineral Mixture Plant	Changsari, Assam
Artificial Insemination Training Institute (AITI)		Guwahati, Assam
Other Projects		
IVF/ETT Laboratories with associated infrastructure	7 locations	Hessarghatta, Alamadhi, Dhamrod, Suratgarh, Andeshnagar, Chiplima and Sunabeda
Quality Assurance Laboratory Equipment for setting of QC Lab for 15 anchor unit of PCDF	-	15 Dairies in Uttar Pradesh

TLPD – thousand litres per day, TPD – tonnes per day, PP – Powder Plant, LPD – Litres per day

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CALF

LABORATORY

CALF is a multi-disciplinary analytical laboratory of NDDB, located at Anand. With state-of-the-art equipment and qualified technical staff, CALF offers reliable and accurate analytical services for dairy products, food products, fruits and vegetables, honey, animal feeds, and genetic analysis at an affordable cost.

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The laboratory supports dairy cooperatives, state dairy federations, government institutions, regulatory agencies, academic and agriculture universities, NDDDB and its subsidiaries; private feed, food, and milk product manufacturers across the country in their endeavour for quality product compliance, quality evaluations, and research & development activities.

The laboratory also offers training services to quality control personnel from dairy cooperatives and conducts training programmes on behalf of government agencies.

During 2020-21, CALF analysed about 38,500 samples for over 7 lakh tests for chemical, microbiology, and genetics analysis. The laboratory has taken various initiatives in the last few years by establishing latest infrastructure for food analysis; enhancing the scope of accreditation & recognitions; offering sample collection facility; and due to promotional activities, the contribution of food analysis has reached 43 per cent in total revenue, while the genetic analysis and feed

analysis have contributed 34 per cent and 23 per cent respectively.

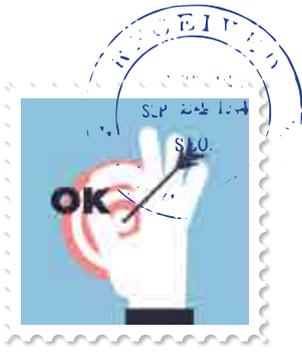
In order to ensure accuracy of results, CALF has implemented a strong and robust quality control programme. During the year, the laboratory participated in 26 Proficiency Testing (PT) programmes/Inter Laboratory Comparisons (ILC) from various National & International Proficiency Testing Providers and contemporary Indian laboratories to evaluate its testing performance in a wide variety of matrices like milk products, honey,

fruits & vegetables, pulses & cereals, water & beverages, nutritional & bakery products, and spices.

The laboratory performance in more than 96 per cent of the participated PT tests, within the acceptable norms, indicating a successful implementation of the quality control programme and ISO/IEC 17025:2017 in its routine operations; and availability of well-trained and competent manpower.

The laboratory supports dairy cooperatives, state dairy federations, government institutions, regulatory agencies, academic and agriculture universities, NDDDB and its subsidiaries; private feed, food, and milk product manufacturers across the country in their endeavour for quality product compliance, quality evaluations, and research & development activities.





38,500

**NUMBER OF SAMPLES ANALYSED
BY CALF IN 2020-21 FOR OVER
7 LAKH TESTS**

CALF follows a quality management system based on ISO 17025:2017 to ensure operational integrity, confidentiality and is accredited by NABL. The laboratory is recognised by the Export Inspection Council and APEDA for testing of milk, honey, and fruits & vegetables as per various Residue Monitoring Plans (RMPs).

In the current year, laboratory has renewed its BIS recognition for three years. The laboratory has obtained recognition for 17 different products covering various milk products and covered new products i.e. Infant milk substitute as per IS 14433:2007, follow up formula-complementary foods as per IS 15757:2007, milk-cereal based complementary foods as per IS 1656:2007, processed cereal-based complementary foods as per IS 11536:2007, packaged natural mineral water as per IS 13428:2005, packaged drinking water as per IS 14543:2016, compounded feeds for cattle as per IS 2052:2009, Di-Calcium phosphate animal feed Grade as per IS 5470:2002 and mineral mixtures for supplementing cattle feeds as per IS 1664:2002.

CALF is a Referral and National Reference Laboratory (NRL) for milk and milk products by FSSAI. Under the NRL, CALF has set up a Proficiency Testing Provider (PTP) facility for milk and milk products, fats and oils, animal feeds, mineral and vitamin premixes

covering compositional parameters, pesticides, antibiotics, mycotoxin, heavy metals, and pathogens in animal feed, milk powder, nutritional foods (Infant milk substitute, cereal-based complementary foods, dietary supplements, malted milk foods & nutraceutical foods).

The laboratory has obtained NABL accreditation for its PTP activity as per ISO/IEC 17043:2010. CALF has become the first PT provider in the state of Gujarat for the above-mentioned scope.

Proficiency testing is a very important Quality Control (QC) tool for a testing laboratory to establish its competency, evaluate performance continuously, and comply the requirement of accreditation. The good performance of a laboratory over time gives confidence to regulatory authorities and its customers on the accuracy of the results.

Further, as NRL CALF supported FSSAI in finalising the method of analysis of dairy and dairy products, method verifications, setting up methods of honey. The laboratory also conducted validation of screening techniques under the Rapid Analytical Food Testing (RAFT) programme of FSSAI.

CALF has assisted various National and International agencies like BIS, CODEX, IDF, AOAC, MoFPI in test method revision, R&D activities, product standards review, project sanctions, etc. CALF continuously upgrades its testing facility and

laboratory infrastructure to cater to the requirement of customers and National regulatory bodies.

CALF has set up a state-of-the-art honey testing facility, which was e-inaugurated in July 2020 by Shri Narendra Singh Tomar, Union Minister for Agriculture and Farmers Welfare. The laboratory has enabled the country to test honey samples for authenticity, which were previously being sent to foreign laboratories for testing. This facility is being used by domestic producers, exporters of honey and regulatory bodies.

Various new test facilities have been created during the year as per the requirement of FSSAI, BIS standards, APEDA, customers, and internal projects of NDDDB. Some of the specialised tests like A1-A2 milk; species authenticity in milk and milk products; vitamin D by LCMS/MS; dietary fibre; on HPLC the testing facility of amino acids in food and feed, betaine in feed supplements and melamine in honey has been commissioned. CALF has also set up a testing facility for organic fertilisers.

Laboratory added several high-end equipment such as ICP-MS, LC-MS/MS to cater to the increased testing requirement of the dairy and food industry.

During the year, laboratory renovated the residue testing facility, sample cell, chemical store, and set up PTP and NRL facility as per the latest regulatory requirements to increase the safety, enhance productivity and kick off new initiatives.

Proficiency testing is a very important Quality Control (QC) tool for a testing laboratory to establish its competency, evaluate performance continuously, and comply the requirement of accreditation.

OTHER ACTIVITIES

Progressive Use of Hindi

Concerted efforts were made during the year to promote progressive use of Hindi in the day-to-day official work. NDDB's Annual Report, training material, Power Point Presentations and other documents were prepared in Hindi. Besides, concrete steps were taken to achieve the targets specified in Annual Programme for 2020-21 issued by the Ministry of Home Affairs, Dept. of Official Language.



NDDB was awarded the Rajbhasha Kirti Puraskar - First prize for the year 2020-21, in Region B.



NDDB, ANAND HAS BEEN AWARDED FIRST PRIZE FOR EXCELLENT PERFORMANCE IN OFFICIAL LANGUAGE IMPLEMENTATION BY TOLIC, ANAND FOR THE YEAR 2019-20

To foster the use of Hindi in office work, Hindi Fortnight was organised in all NDDB offices between September 14 and 28. Keeping in view the COVID-19 protocol, an online lecture by a prominent Hindi scholar, was organised on Hindi Diwas, wherein a good number of employees across the organisation participated. In addition to this, competitions like poetry recitation, Hindi elocution, on-the-spot Hindi essay writing and translation were organised for creating a conducive atmosphere and promote use of

Hindi in office work. A large number of employees participated in the competitions and an amount of ₹ 69,800 was distributed to the winners of various competitions by online direct bank transfer.

NDDB has various incentive schemes for promotion of Hindi in office work. One such scheme is Hindi Noting and Drafting Incentive Scheme. 53 employees participated in this scheme and cash incentive amounting to ₹ 1,56,000 was given to the employees during, year 2020-21. Ten employees whose children scored 75 per cent and more marks in Hindi in Class 10th and 12th

examination, were given a cash prize of ₹ 2,000 each.

During the year 2020-21, NDDB Anand continued its association with Town Official Language Implementation Committee (TOLIC), Anand and actively participated in its online half yearly meetings. NDDB, Anand has been awarded first prize for excellent performance in Official Language Implementation by TOLIC, Anand for the year 2019-20. Under the aegis of TOLIC, Anand, NDDB organised an online Hindi poetry recitation competition in which a good number employees of various organisations associated with TOLIC

Ten employees whose children scored 75 per cent and more marks in Hindi in Class 10th and 12th examination, were given a cash prize of ₹ 2,000 each.

₹ 69,800

AMOUNT WAS DISTRIBUTED TO THE WINNERS OF VARIOUS COMPETITIONS BY ONLINE DIRECT BANK TRANSFER



Anand participated. Besides, NDDDB employees contributed Essay and poetry in "Ujjwal Anand" magazine published by TOLIC, Anand.

Online and desk trainings on Microsoft quick parts, custom office template creation and usage of Hindi proof reading and voice typing tool were imparted to the employees. In addition to this, several online workshops on Official Language were also organised to encourage employees to work in Hindi. Hindi e-magazine "Srijan" was published in Hindi on quarterly basis.

NDDDB library has a large number of books in Hindi. During the year, books in Hindi, amounting to about ₹ 87,995 were added to the library.

All national programmes viz. Republic Day, Independence Day, Gandhi Jayanti, Shastri Jayanti and Dr. Ambedkar Jayanti etc., were organised in Hindi language.

Welfare of SC/ST Employees

Online training in functional and general management areas was facilitated for SC/ST employees during the year. SC/ST officers under Future Leadership Development Programme of NDDDB continued to work on developmental assignments. In all, 22 training nominations for SC/ST employees were processed. Welfare measures for SC/ST employees also continued during the year, including recognition to meritorious children of SC/ST employees for their academic achievements through cash prize and certificates. To encourage academic orientation, SC/ST employees were reimbursed expenses incurred on education as well as books for their children.

All offices of NDDDB celebrated Ambedkar Jayanti as a mark of respect to Dr. BR Ambedkar.



SUBSIDIARIES

IDMC Limited

Indian Dairy Machinery Company was established in 1978. It is incorporated as IDMC Limited under the Companies Act 1956. IDMC offers processing and packaging solutions to its customers across dairy, cattle feed, pharmaceutical and thermal management lines of business under its Metals and Plastics segments. IDMC reported a total revenue of ₹ 4,989.83 million for the year.

During the year under the Metals segment, IDMC successfully executed several dairy projects for its customers, which included processing plants ranging from 1 lakh litre per day (LLPD) to 10 LLPD liquid milk processing capacity along with manufacturing of milk products such as butter, flavoured milk and fermented products. A UHT milk processing line of capacity 100 TLPD on turnkey basis for the production of aseptic milk in flexible pouches was put into commercial operation which includes an in-house manufactured UHT steriliser of capacity 6,600 litres per hour. Two plants of 250 TLPD and 150 TLPD were commissioned for production and packing of buttermilk

in western India. The company also commissioned a membrane-based milk concentration plant of capacity 3 LLPD in southern India.

In the Thermal Management sector, several fully automated ammonia refrigeration systems with capacities ranging from 80 TR to 2,140 TR were commissioned during the year for various customers. Apart from this, IDMC also installed and commissioned several energy efficient stainless steel Ice Silos during the year. The concept of ice silo has been well accepted over the last decade in the dairy industry and IDMC is a pioneer in the manufacture of these silos in India.

Under the pharmaceutical line of business, the company supplied and commissioned several reactors for manufacturing next generation Statins to a pharmaceutical company in north India. The company also supplied equipment like fermenters and dosing vessels to augment the existing steroid production at one of the pharmaceutical facility in central India.

IDMC's R&D Centre was successful in developing new products such as Automated Milk Sampling systems which automatically collects the milk samples during the transfer of milk from a collection centre to a road milk tanker, Solar Bulk Milk Coolers and Continuous Khoa manufacturing machine.



IDMC marketed a range of food processing equipment such as pasteurisers, ice-cream freezers, continuous butter-making machines, servo driven cup cone filling machines, and products such as milking machines, bulk milk coolers (BMCs), pumps, valves and fittings.

IDMC's R&D Centre was successful in developing new products such as Automated Milk Sampling systems which automatically collects the milk samples during the transfer of milk from a collection centre to a road milk tanker, Solar Bulk Milk Coolers and Continuous Khoa manufacturing machine.

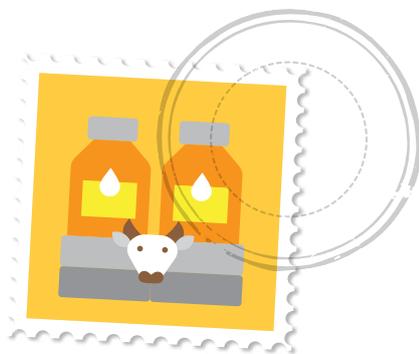
The plastic segment of the company continued to cater to the existing customers through its product offerings of packaging films for liquid milk and milk products such as ghee, curd, buttermilk, high barrier laminates for milk powder and other food products. IDMC expanded its lamination capacity and this has enhanced its capability to cater to its customers. The company also made a foray into exports by supplying multilayer aseptic film for packaging milk to overseas customers.

Indian Immunologicals Limited

Indian Immunologicals Limited (IIL) was established in 1982. It is incorporated under the Companies Act 1956. Despite being a challenging year, IIL achieved a turnover of ₹ 7,353 million during 2020-21, which is a degrowth by 18 per cent compared to previous financial year. COVID-19 had an impact on the overall business of IIL in the form of reduced exports, trade, and Institutional businesses.

Being a vaccine manufacturer for both Animal Health and Human Health, IIL plays a significant role in achieving the objectives of One Health i.e., equal concern for the betterment of health and life of animals and humans alike.

Capacity augmentation and upgrading of facilities is a continuous aspect of vaccine manufacturing business. During 2020-21, IIL has taken initiatives to upgrade the manufacturing technologies of both the Animal Health and Human Health segments. On the Animal Health side, IIL has upgraded the FMD and



IIL's Research and Development Centre has several ongoing product development programmes which are in advanced stages of Clinical Trials. The R&D portfolio includes Hepatitis A, Chikungunya, Dengue, Measles & Rubella, and Infectious Bovine Rhinotracheitis (IBR) etc.

Brucella manufacturing facilities at a cost of ₹ 580 million. In the Human Health segment, IIL has increased the filling capacities of vaccines at Karakapatla to 28 million doses from the existing 10 million doses capacity. At the Gachibowli facility of IIL, establishment of Hepatitis A vaccine facility is also making good progress.

IIL is currently working with Bharat Biotech International Limited (BBIL) for augmentation of capacity for production of Covaxin (COVID-19 vaccine). Technology Transfer is in progress and the vaccine drug substance is expected to be made by August 2021. Besides this, IIL's own research on COVID-19 in collaboration with Griffith University, Australia is also in progress.

Apart from the above, IIL's Research and Development Centre has several ongoing product development programmes which are in advanced stages of Clinical Trials. The R&D portfolio includes Hepatitis A, Chikungunya, Dengue, Measles & Rubella, and Infectious Bovine Rhinotracheitis (IBR) etc.

IIL's Corporate Social Responsibility (CSR) are centred on animal welfare and child welfare & nutrition. Animal welfare activities of IIL include Operation Gourakhsa – a project for the welfare of destitute cattle housed in goushalas and panjrapoles, Project CHANP (Calf Health & Nutrition) – a project for nurturing newborn calves till the age of their puberty, support for stray animal health, an initiative by Utkarsh Global Foundation, Mumbai etc. For supporting child welfare, IIL is helping the Telangana Government by adopting few schools around the Karakapatla manufacturing facility. Through this initiative, IIL provides uniforms, books & stationery, support for midday meal programme and providing infrastructure for school including furniture, kitchen and toilets etc., IIL also supports NDDB's initiatives such as the Giftmilk programme and Project for Manure Management.



Mother Dairy Fruit &

Vegetable Private Limited

Mother Dairy, Delhi was established in 1974 to meet the liquid milk demand of Delhi NCR. It is incorporated as Mother Dairy Fruit & Vegetable Pvt Ltd (MDFVPL). Under the Companies Act 1956. In 2020-21, Company achieved a turnover of around ₹ 1,00,000 million, almost at par with last year.

The financial year 2020-21 has been a year of challenges and opportunities. With pandemic striking the nation unprecedentedly, MDFVPL continued to serve consumers by reaching out to them in all possible manner. Multiple channels including exclusive booth network, general trade and e-commerce were optimised for driving sales. The existing owned exclusive outlets and franchisee stores catered to the consumers, throughout the lockdown period. To improve consumer proximity, Mother Dairy opened new retail format branded as 'Mother Dairy Points' selling the entire range of milk, milk products, Dhara oil & Safal F&V products.

The lockdown affected the milk markets badly in the first quarter of the year 2020-21. Efforts were made to educate the milk producers on COVID appropriate behaviour through pamphlets and posters.

The Company strengthened its position by leveraging transparency in operations, remunerative milk price and extension activities. MDFVPL procured nearly one million Kg milk per day from about 7,000 villages in Maharashtra, Uttar Pradesh and Rajasthan.

Milk procurement in the drought affected Marathwada & Vidarbha regions of Maharashtra was extended to about 2,500 villages and over 200 TKgPD milk was procured annually. The total benefit to the farmers in the region has been nearly ₹ 2,500 million in the form of milk payments during the year.

As part of MDFVPL's strategy to expand its production capacity, Cold Concentration Project was set up in Balaji resulting in an additional Evaporation capacity, Motihari poly pack milk plant capacity was doubled and Etawah paneer capacity was enhanced by 30 per cent.

Milk Business has registered a slight volume decline over last year majorly impacted by pandemic. Cow milk volume increased by four per cent over last year, reinforcing its position as the largest Cow Milk brand in the country. This year, small pack volume has shown 25 per cent



growth over last year. Significant volume growth was achieved in Bihar, West Bengal and Nagpur.

Value-Added Dairy Products were adversely hit by lockdown. E-Commerce business grew with consumers opting for convenience and home deliveries during restrictions. Modern Trade and Institutional channel business came down significantly as stores were closed. Due to social distancing, consumer footfalls dropped to ~50 per cent compared to the previous year. Demand from railways, airlines and HoReCa also suffered due to lockdowns.

Mother Dairy saw a remarkable growth in categories like: Paneer and Cheese. On the go and impulse categories like beverages & ice cream declined.

As part of MDFVPL's strategy to expand its production capacity, Cold Concentration Project was set up in Balaji resulting in an additional Evaporation capacity, Motihari poly pack milk plant capacity was doubled and Etawah paneer capacity was enhanced by 30 per cent.

Edible Oil business has been consistently growing. Last 5 years CAGR for turnover is 20 per cent with significant growth in volumes. The Brand Strength primarily is in the indigenous oil with major categories in Mustard followed by soybean oil. Mustard category grew by 15 per cent in 2020-21. During 2020-21, consumer pack sales grew by 14 per cent.

Horticulture, Frozen and Pulp F&V facility at Ranchi was stabilised and farmers of Jharkhand were provided access to national markets. Corn Contract Farming model was scaled up to 502 acres, thereby creating sustainable raw material supply for Ranchi plant. Ranchi plant was certified to process organic fruit pulps.

Small farmers of Bihar were directly linked with Delhi market through "Bihar tarkari initiative" and 100 MT of assorted vegetables were directly sourced from farmer co-operatives in Bihar. The Economic Times Edge has awarded Safal with the Best Brand for the year 2020 under 'The Frozen Foods category'.

R&D developed 25 new products that were launched in the market during 2020-21. Mother Dairy also ventured in the category of Bakery by introducing White, Brown and Fruit Breads in its product portfolio.

In new technology development, R&D worked on Packaging Technology Platforms to provide better consumer experience, convenience, and cost optimisation. Mother Dairy introduced unique concept of "Perforated pouch for stick-less ice cream bar" for the first time in India. This concept provided the convenience of easy tearing & holding the pack for contactless consumption experience.

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Mother Dairy implemented the new technology of Silver-Ion Application in paneer packaging to increase the product keeping quality. R&D also worked and implemented several environmental-friendly packaging solutions such as paper-based packs for ice creams.

R&D identified and optimised cost by re-engineering granule composition and thickness in milk film and stack height optimisation during transportation. R&D Packaging Innovations won the "Packaging Excellence India Star Awards" organised by Indian Institute of Packaging which is a premier event with worldwide recognition.

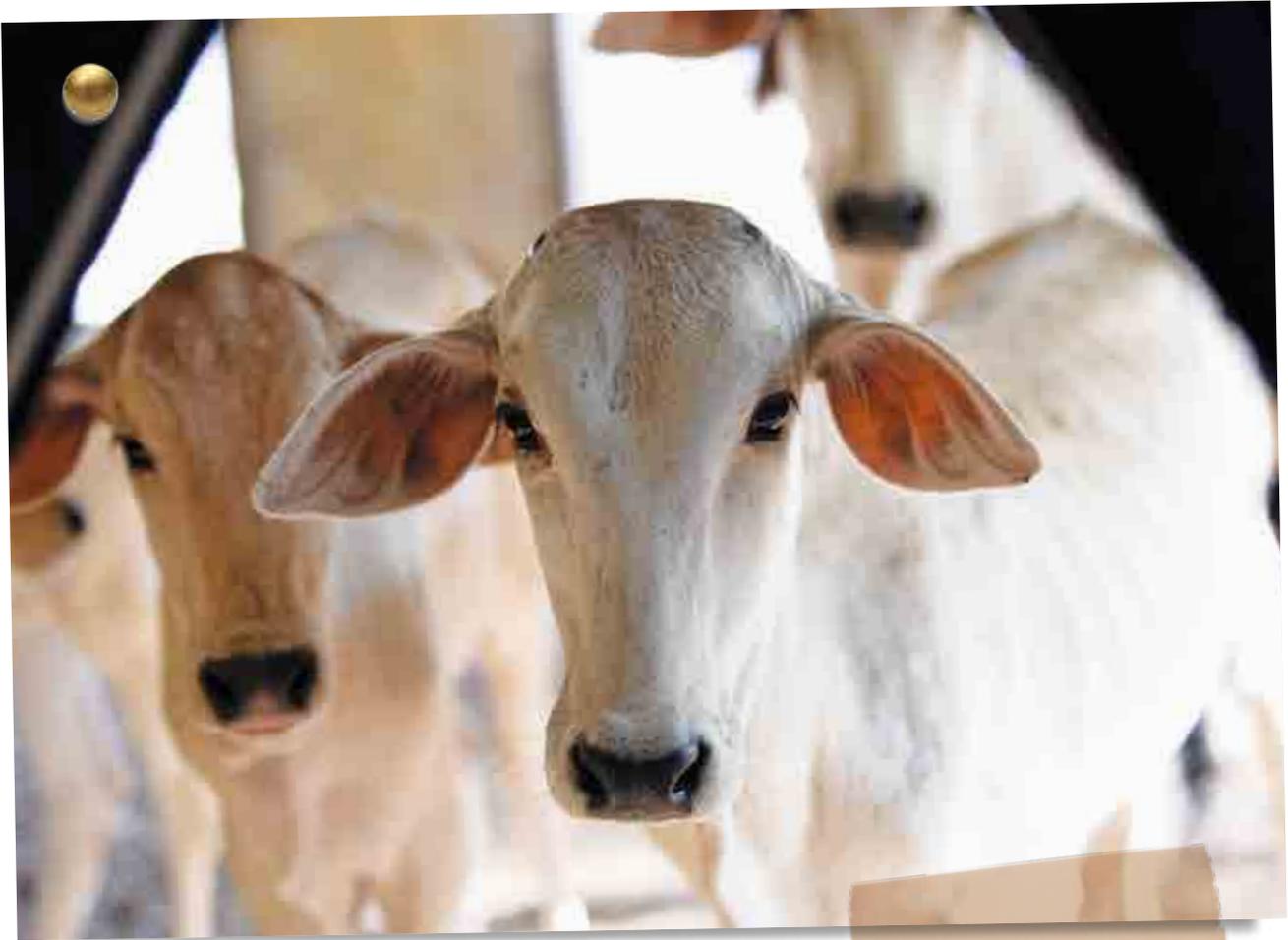
Central Analytical Lab (CAL) continued working on the analysis of Product Parameters that influence consumer experience as well as Food Safety Parameters. CAL is also working on Research initiatives such as developing a credible method for the detection of adulteration in Ghee through fatty acid profiling across different breeds of animals, geography and seasons. This data will be built during next one year. CAL is also working on reducing the cost of antibiotic detection through in-house development.

Mother Dairy has been granted patent for "A Method for Detection of Sorbitol in Milk and a System for Detecting the same thereof" which is an Adulteration Detection method developed by CAL.

Scientific, Regulatory Affairs and Nutrition (SRAN) at Innovation Centre continuously engaged with the Central and State Pollution Control Board/ MOEFCC Industry Consortium, for the compliance of Plastic Waste Management Rules 2016. MDFVPL has recycled 4,352 MT of plastic waste (1,703 MT multilayered plastic waste & 2,649 MT of single layered plastic waste), thereby reducing CO₂ emission by 4,300 Tonnes approx. during 2020-21.

Efforts in resource optimisation have resulted in in-house generation of one million units of electricity and reduction of 868 tonnes of CO₂ emission resulting in savings of ₹ 8.1 million during 2020-21. Initiatives to cater hot water requirement in canteen and processes through CST project in Patparganj have reduced PNG consumption by almost 50k SCM, resulting in savings of 1.6 million during 2020-21.

NDDB Dairy Services



NDDB Dairy Services (NDS) was incorporated in 2009 as a not-for-profit company under Section 8 of the Companies Act to promote producer companies and productivity enhancement services. NDS manages the four largest semen stations in the country - Sabarmati Ashram Gaushala in Bidaj (Gujarat), Animal Breeding Centre in Raebareli (Uttar Pradesh), Alamadhi Semen Station (Tamil Nadu) and Rahuri Semen Station (Maharashtra).

During the year, the four semen stations together produced around 33.2 million semen doses and sold about 42 million semen doses. This was achieved in spite of the loss in production and sales during the first quarter of 2020-21 due to the COVID-19 lockdown in the country.

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NDS was able to successfully conduct field trials using the sex sorting technology, developed with help of the Bengaluru-based Jiva Sciences. During the year, the first female calf from sex sorted semen dose produced at Alamadhi semen station was born near Chennai. NDS had taken up the project to develop an indigenous technology for sex sorting bovine sperms a few years back with an objective to significantly bring down the cost of the sex sorted semen doses which would lead to large scale adoption of the technology in the country.

During the year, a total of about 1,790 embryos were produced through IVF, out of which 1,470 embryos were frozen and remaining 320 were transferred.

In-vivo embryo production and transfer using ET technology were carried out at nine farms in the states of Rajasthan and Maharashtra in order to produce high genetic merit calves for the farmers. A total of 135 viable embryos predominantly of indigenous breeds like Sahiwal, Gir, Tharparkar and Rathi were produced, out of which 56 embryos were transferred fresh and 79 embryos were frozen for future use.

ET carried out in the field has led to its popularisation and increase in demand for embryos from the dairy farmers.

A project was taken up with Government of Rajasthan to produce and transfer 150 embryos of Gir

and Tharparkar breeds. The project has been successfully completed and the desired number of embryos produced. Of the 150 embryos produced, 142 embryos were transferred to recipient cows and remaining 8 embryos were frozen for future use.

During the year, NDS facilitated Refresher training and Orientation programmes and Skill building programmes for Board of Directors (BoD) of the MPCs. Leadership development programmes for the members of the MPCs, Orientation programmes for new recruits and refresher training programmes for the existing field teams of the MPCs were carried out.

NDS is recognised as one of the support organisations for Deen Dayal Antyodaya Yojana (DAY-NRLM) by Ministry of Rural Development, GoI. Under agreements with Madhya Pradesh, Bihar and Uttar Pradesh State Rural Livelihood Missions, NDS has set up Milk Producer Companies approved under NRLM namely Maalav Mahila MPC, Rajgarh and Muktaa Mahila MPC, Sagar in Madhya Pradesh,



1,790

NUMBER OF EMBRYOS PRODUCED BY NDDB DAIRY SERVICE THROUGH IVF IN 2020-21

Kaushikee Mahila MPC, Saharsa in Bihar, Balinee MPC, Jhansi in Uttar Pradesh and Ujalaa MPC, Kota in Rajasthan. NDS facilitated the operationalisation of Ujalaa MPC by assisting in recruitment and training of professionals and field personnel, obtaining various licenses, and setting up infrastructure for milk procurement and forward linkages.



Dairy Cooperatives at a Glance

Dairy Cooperative Societies

(in numbers)^

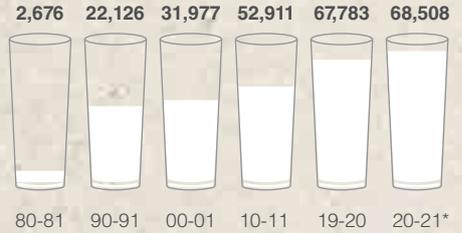
Region/State	80-81	90-91	00-01	10-11	19-20	20-21 *
NORTH						
Haryana	505	3,229	3,318	7,019	7,500	7,567
Himachal Pradesh		210	288	740	1,011	1,084
Jammu & Kashmir		105	**	**	620	680
Punjab	490	5,726	6,823	7,069	7,385	7,385
Rajasthan	1,433	4,976	5,900	16,290	15,067	15,486
Uttar Pradesh	248	7,880	15,648	21,793	32,031	32,101
Uttarakhand					4,169	4,205
Regional Total	2,676	22,126	31,977	52,911	67,783	68,508
EAST						
Assam		117	125	155	457	522
Bihar	118	2,060	3,525	9,425	23,510	24,282
Jharkhand				53	690	769
Meghalaya					97	97
Mizoram					42	42
Nagaland		21	74	49	52	52
Odisha		736	1,412	3,256	6,058	6,159
Sikkim		134	174	287	540	587
Tripura		73	84	84	117	119
West Bengal	584	1,223	1,719	3,019	3,764	3,803
Regional Total	702	4,364	7,113	16,328	35,327	36,432
WEST						
Chhattisgarh				757	1,106	1,110
Goa		124	166	178	183	183
Gujarat	4,798	10,056	10,679	14,347	19,538	19,522
Madhya Pradesh	441	3,865	4,877	6,216	10,094	10,205
Maharashtra	718	4,535	16,724	21,199	20,762	20,897
Regional Total	5,957	18,580	32,446	42,697	51,683	51,917
SOUTH						
Andhra Pradesh	298	4,766	4,912	4,971	3,299	3,349
Karnataka	1,267	5,621	8,516	12,372	16,416	16,789
Kerala		1,016	2,781	3,666	3,331	3,337
Tamil Nadu	2,384	6,871	8,369	10,079	10,076	10,487
Telangana					5,176	5,188
Puducherry		71	92	102	104	107
Regional Total	3,949	18,345	24,670	31,190	38,402	39,257
Grand Total	13,284	63,415	96,206	143,126	193,195	196,114

^Organised (cumulative), includes conventional societies and Taluka unions formed earlier

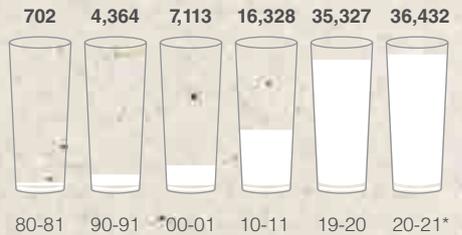
* Provisional ** Not reported

Source: Milk Unions & Federations

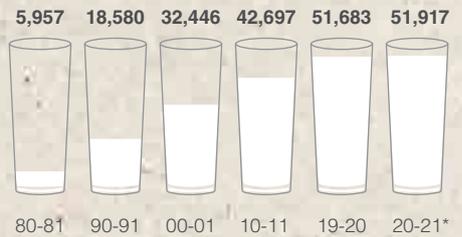
NORTH



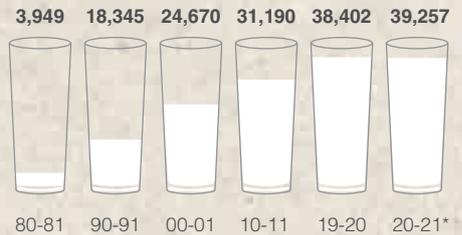
EAST



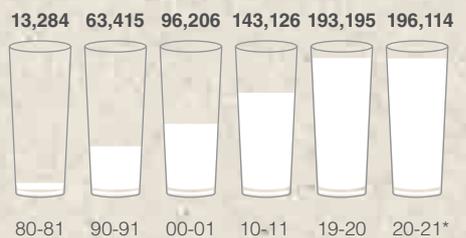
WEST



SOUTH



GRAND TOTAL



Producer Members

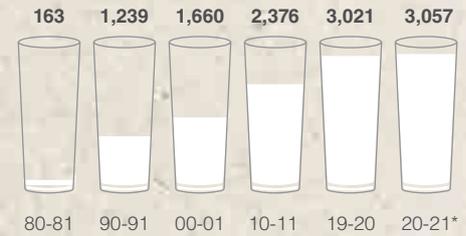
(in thousands)

Region/State	80-81	90-91	00-01	10-11	19-20	20-21 *
NORTH						
Haryana	39	184	185	313	319	319
Himachal Pradesh		17	20	32	46	47
Jammu & Kashmir		2	**	**	26	26
Punjab	26	304	370	385	372	373
Rajasthan	80	340	436	669	827	854
Uttar Pradesh	18	392	649	977	1,271	1,279
Uttarakhand					157	159
Regional Total	163	1,239	1,660	2,376	3,021	3,057
EAST						
Assam		2	1	4	29	34
Bihar	3	100	184	523	1,205	1,239
Jharkhand				1	21	23
Meghalaya					4	4
Mizoram					1	1
Nagaland		1	3	2	2	2
Odisha		46	111	187	314	325
Sikkim		4	5	10	14	15
Tripura		4	4	6	8	8
West Bengal	20	66	114	213	245	246
Regional Total	23	223	422	946	1,843	1,899
WEST						
Chhattisgarh				31	43	43
Goa		12	18	19	19	19
Gujarat	741	1,612	2,147	2,970	3,637	3,655
Madhya Pradesh	24	150	242	271	341	351
Maharashtra	87	840	1,398	1,818	1,794	1,797
Regional Total	852	2,614	3,805	5,109	5,835	5,865
SOUTH						
Andhra Pradesh	33	561	702	846	581	582
Karnataka	195	1,013	1,528	2,124	2,628	2,571
Kerala		225	637	851	993	1,025
Tamil Nadu	481	1,590	1,957	2,176	2,030	1,981
Telangana					259	241
Puducherry		17	27	36	42	42
Regional Total	709	3,406	4,851	6,033	6,533	6,442
Grand Total	1,747	7,482	10,738	14,464	17,232	17,263

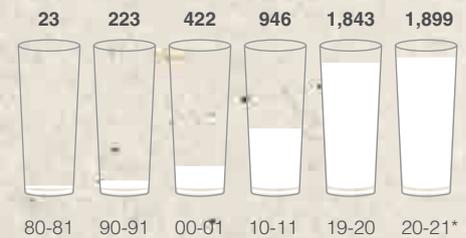
* Provisional ** Not reported

Source: Milk Unions & Federations

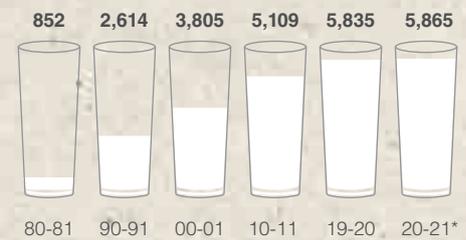
NORTH



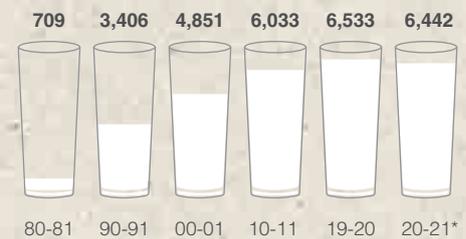
EAST



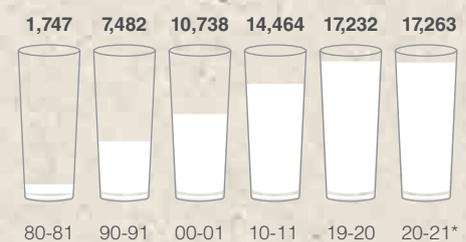
WEST



SOUTH



GRAND TOTAL



Dairy Cooperatives at a Glance

Milk Procurement

(in thousand kilograms per day)#

Region/State	80-81	90-91	00-01	10-11	19-20	20-21 *
NORTH						
Haryana	33	94	276	511	457	562
Himachal Pradesh		14	24	60	79	92
Jammu & Kashmir		11	**	**	38	92
Punjab	75	394	912	1,037	1,583	1,842
Rajasthan	138	364	887	1,629	2,669	2,557
Uttar Pradesh	64	382	791	504	331	282
Uttarakhand					184	189
Regional Total	310	1,259	2,890	3,741	5,341	5,616
EAST						
Assam		4	3	5	30	29
Bihar	3	95	330	1,091	1,749	1,424
Jharkhand				5	146	134
Meghalaya					14	14
Mizoram					6	5
Nagaland		1	3	2	4	3
Odisha		41	94	276	443	366
Sikkim		4	7	12	35	40
Tripura		3	1	2	8	7
West Bengal	31	52	204	273	232	203
Regional Total	34	200	642	1,666	2,667	2,225
WEST						
Chhattisgarh				25	87	70
Goa		16	32	38	58	55
Gujarat	1,344	3,102	4,567	9,158	21,590	24,580
Madhya Pradesh	68	256	319	588	875	913
Maharashtra	165	1,872	2,979	3,053	3,315	3,515
Regional Total	1,577	5,246	7,897	12,862	25,926	29,133
SOUTH						
Andhra Pradesh	79	763	879	1,371	1,329	1,379
Karnataka	261	917	1,887	3,742	7,443	7,878
Kerala		185	646	688	1,276	1,384
Tamil Nadu	301	1,106	1,618	2,097	3,390	3,691
Telangana					572	456
Puducherry		26	45	35	57	61
Regional Total	641	2,997	5,075	7,932	14,066	14,849
Grand Total	2,562	9,702	16,504	26,202	48,001	51,823

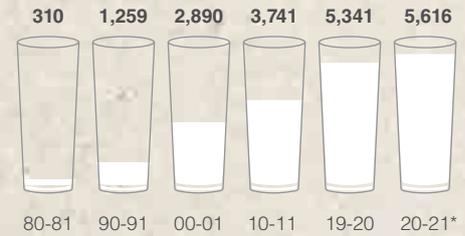
Includes outside State operations

* Provisional ** Not reported

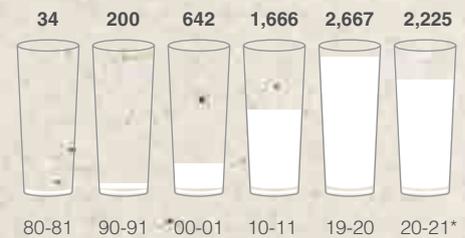
Gujarat's total milk procurement in 2020-21 includes 4,237 TKgPD from outside the State and in 2019-20, the corresponding figure was 3,029 TKgPD.

Source: Milk Unions & Federations

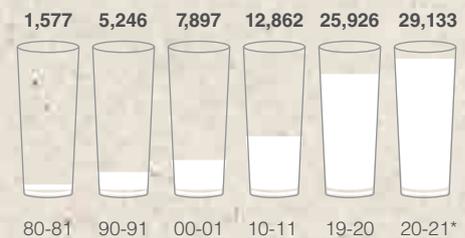
NORTH



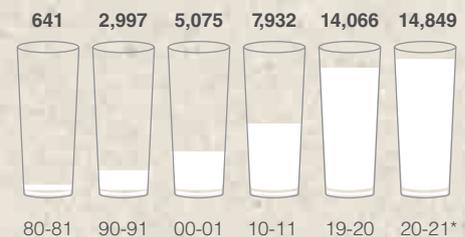
EAST



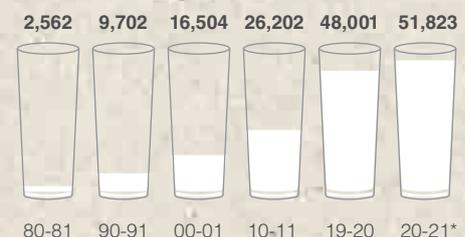
WEST



SOUTH



GRAND TOTAL



Liquid Milk Marketing

(in thousand litres per day)#

Region/State	80-81	90-91	00-01	10-11	19-20	20-21*
NORTH						
Haryana	2	80	108	362	335	283
Himachal Pradesh		15	20	23	21	23
Jammu & Kashmir		9	**	**	66	99
Punjab	7	139	420	802	1,102	1,010
Rajasthan	12	136	540	1,505	2,424	2,084
Uttar Pradesh	1	326	436	380	1,210	1,437
Uttarakhand					169	157
Delhi	697	1,051	1,524	3,050	6,822	6,682
Regional Total	719	1,756	3,048	6,122	12,149	11,775
EAST						
Assam		10	7	22	54	59
Bihar	8	111	324	454	1,206	1,275
Jharkhand				253	392	383
Meghalaya					13	13
Mizoram					6	4
Nagaland		1	4	3	5	5
Odisha		65	98	290	406	323
Sikkim		5	7	17	44	44
Tripura		6	7	15	12	9
West Bengal	17	26	27	41	60	86
Kolkata	283	526	840	644	1,104	1,207
Regional Total	308	750	1,314	1,739	3,301	3,407
WEST						
Chhattisgarh				34	172	177
Goa		36	83	69	62	57
Gujarat	210	1,052	1,905	3,237	5,520	5,362
Madhya Pradesh	39	279	244	495	878	797
Maharashtra	18	363	1,178	2,023	1,889	1,643
Mumbai	950	1,057	1,390	841	2,921	2,685
Regional Total	1,217	2,787	4,800	6,699	11,443	10,720
SOUTH						
Andhra Pradesh	19	552	733	1,565	1,276	1,323
Karnataka	166	889	1,501	2,661	4,325	4,246
Kerala		223	640	1,092	1,329	1,308
Tamil Nadu	109	405	559	989	1,110	1,167
Telangana					883	875
Puducherry		22	43	93	94	92
Chennai	245	662	725	1,025	1,216	1,230
Regional Total	539	2,753	4,201	7,425	10,233	10,243
Grand Total	2,783	8,046	13,363	21,985	37,126	36,146

Includes Metro Dairies and outside State operations

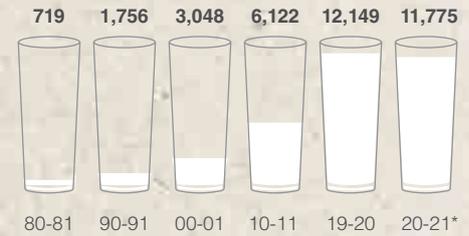
* Provisional ** Not reported

Gujarat's total milk marketing in 2020-21 including outside the State stands at 13,400 TLPD and in 2019-20, the corresponding figure was 13,026 TLPD.

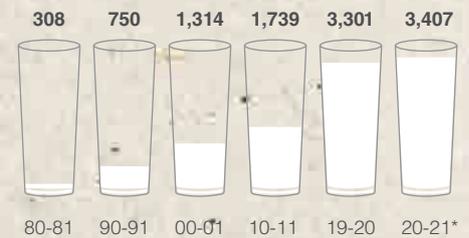
In 2010-11, break-up of sale volume by Maharashtra Milk Unions in Mumbai not available

Source: Milk Unions & Federations

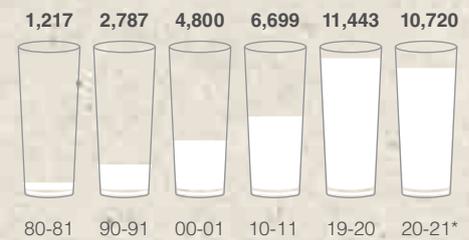
NORTH



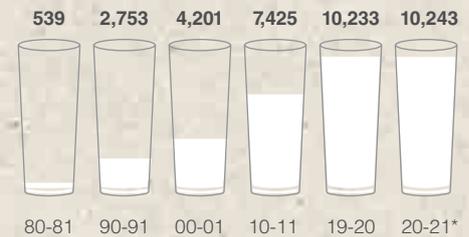
EAST



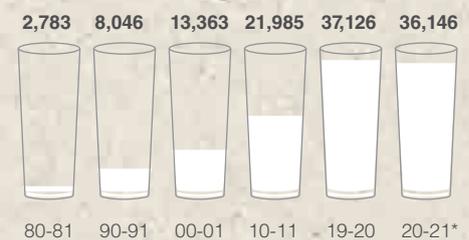
WEST



SOUTH



GRAND TOTAL



Dairy Cooperatives at a Glance

Dairy Cooperatives' Cold Chain Infrastructure (capacity) *

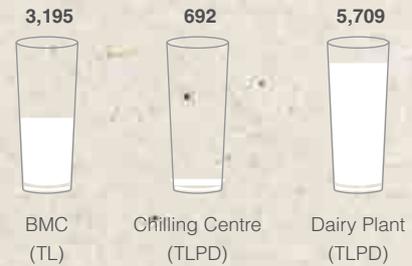
(March 2021)

Region/State	BMC (TL)	Chilling Centre (TLPD)	Dairy Plant (TLPD)
NORTH			
Delhi			1,500
Haryana	407	330	7,125
Himachal Pradesh	136	80	100
Jammu & Kashmir	147		150
Punjab	2,120	747	2,485
Rajasthan	4,192	525	4,095
Uttar Pradesh	912	469	4,740
Uttarakhand	71	65	245
Regional Total	7,985	2,216	20,440
EAST			
Assam	39		60
Bihar	1,870	389	3,020
Jharkhand	225	10	690
Meghalaya			
Mizoram	6		20
Nagaland	2		10
Odisha	776	80	680
Sikkim	19		65
Tripura	13		24
West Bengal	246	213	1,140
Regional Total	3,195	692	5,709
WEST			
Chhattisgarh	97	70	150
Goa	47		110
Gujarat	22,120	7,097	27,895
Madhya Pradesh	1,657	766	1,763
Maharashtra	2,173	2,060	12,780
Regional Total	26,094	9,993	42,698
SOUTH			
Andhra Pradesh	2,164	498	2,905
Karnataka	5,416	3,000	9,525
Kerala	1,500	100	2,469
Tamil Nadu	1,785	1,425	4,121
Telangana	711	363	1,275
Puducherry	50		120
Regional Total	11,626	5,386	20,415
Grand Total	48,901	18,287	89,262

NORTH



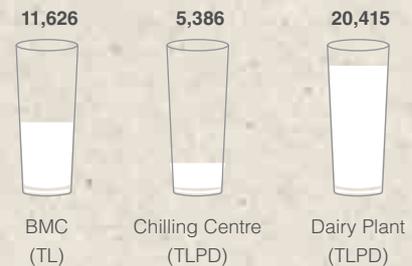
EAST



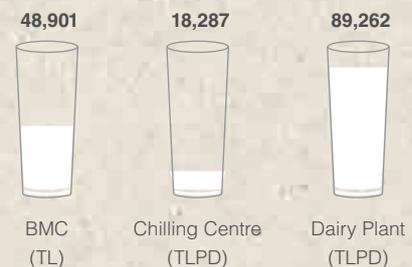
WEST



SOUTH



GRAND TOTAL



* Provisional

TL: Thousand Litres

TLPD: Thousand Litres Per Day

Source: Milk Unions/Dairies & Federations

Visitors



Shri Giriraj Singh, Union Minister,
Fisheries, Animal Husbandry & Dairying,
Government of India



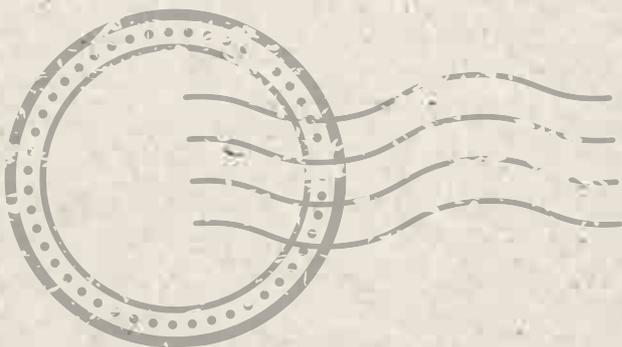
Shri Amar Nath, Joint Secretary,
Petroleum and Natural Gas,
Government of India



Dr. Milind Ramteke (IAS), Deputy Director,
Lal Bahadur Shastri National Academy Of
Administration (LBSNAA)



Shri A Sreenivas, Managing Director,
Haryana Dairy Development
Cooperative Federation



Accounts

Khimji Kunverji & Co LLP

Chartered Accountants

INDEPENDENT AUDITOR'S REPORT

To:

The Board of Directors of
National Dairy Development Board

REPORT ON THE AUDIT OF THE STANDALONE FINANCIAL STATEMENTS

OPINION

1. We have audited the accompanying Standalone Financial Statements of National Dairy Development Board ('the Board' or 'NDDDB'), which comprise the Balance Sheet as at March 31, 2021, Income and Expenditure Account and the Cash Flow Statement for the year then ended, and notes to the Standalone Financial Statements, including a summary of significant accounting policies and other explanatory information ('Standalone Financial Statements').

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid Standalone Financial Statements give the information required by National Dairy Development Board (Administration of Funds, Accounts and Budget) Regulations, 1988 and exhibit a true and fair view, in conformity with the Accounting Standards notified by the Institute of Chartered Accountants of India ('ICAI') and accounting principles generally accepted in India, of the state of affairs of the Board as at March 31, 2021, its surplus and its cash flows for the year ended on that date.

BASIS OF OPINION

2. We conducted our audit in accordance with the Standards on Auditing ('SAs') issued by the ICAI. Our responsibilities under those SAs are further described in the Auditor's Responsibilities for the Audit of the Standalone Financial Statements section of our report. Those Standards require that we comply with ethical requirements. We are independent of NDDDB in accordance with the Code of Ethics issued by ICAI and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics. We believe that the audit evidence we have obtained is sufficient and appropriate to provide the basis for our opinion.

EMPHASIS OF THE MATTER

3. Attention is invited to Note No. 11 of Annexure XVI to Notes to accounts of the Standalone Financial Statements regarding the uncertainties arising out of the ongoing COVID-19 pandemic and the assessment made by the management of NDDDB on its operations and financial reporting for the year ended March 31, 2021; such an assessment and the outcome of the pandemic, as made by the management, is dependent on the circumstances as they evolve in the subsequent periods. Our report is not modified in respect of this matter.

INFORMATION OTHER THAN THE FINANCIAL STATEMENTS AND AUDITOR'S REPORT THEREON

4. NDDDB's Management and Board of Directors are responsible for the preparation of the other information, comprising of the information such as Report of Board of Directors and such other disclosures included in the annual report of NDDDB, excluding the Financial Statements and auditors' report thereon ('Other Information').

The other information is expected to be made available to us after the date of this auditors' report. Our opinion on the standalone financial statements does not cover the other information and we do not express any form of assurance or conclusion thereon.

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Khimji Kunverji & Co LLP

Chartered Accountants

In connection with our audit of the Standalone Financial Statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the Standalone Financial Statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. When we read the other Information and if we conclude that there is a material misstatement therein, we are required to communicate the matter to those charged with governance as required under SA 720 'The Auditor's responsibilities Relating to other Information'.

MANAGEMENT'S RESPONSIBILITY FOR THE STANDALONE FINANCIAL STATEMENTS

5. Management and Board of Directors of NDDDB is responsible for the preparation of the Standalone Financial Statements in accordance with the National Dairy Development Board (Administration of Funds, Accounts and Budget) Regulations, 1988, that give a true and fair view of the financial position, financial performance, and cash flows of NDDDB. This responsibility also includes maintenance of adequate accounting records for safeguarding the assets of the NDDDB and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies, making judgments and estimates that are reasonable and prudent, design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the Standalone Financial Statements, the Management and Board of Directors are also responsible for assessing the NDDDB's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Board or to cease operations, or has no realistic alternative but to do so.

The Board of Directors is also responsible for overseeing NDDDB's financial reporting process.

AUDITOR'S RESPONSIBILITY FOR THE AUDIT OF THE STANDALONE FINANCIAL STATEMENTS

6. Our objectives are to obtain reasonable assurance about whether the Standalone Financial Statements, as a whole, are free from material misstatement, whether due to fraud or error and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these Standalone Financial Statements. Our audit processes in accordance with the SAs are narrated in Annexure 1 to this report.

OTHER MATTERS

7. (A) The statutory audit for the preceding financial year was not carried out by us. The figures, numbers and details pertaining to previous year have been traced from the Standalone Financial Statements of the previous year audited by M/s Borkar & Muzumdar., Chartered Accountants, Mumbai vide their un-modified report dated August 06, 2020,
- (B) Due to restricted movements and partial lockdown imposed by the Authorities to prevent the spread of COVID-19, the entire audit finalization process, for the year under report, was carried out from remote locations i.e. other than the Head Office of the Board where books of account and other records are kept, based on data/details and financial information/records remitted by the management through digital medium. Being constrained, we resorted to alternate audit procedures to obtain sufficient and appropriate audit evidence for the significant matters.

Our report is not modified in respect of the above matters.

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Chartered Accountants

REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

8. The Balance Sheet and the Income and Expenditure Account of NDDB have been drawn up as per Schedule 'I' and Schedule 'II' of Chapter VI of National Dairy Development Board (Administration of Funds, Accounts and Budget) Regulations, 1988.

As required by the provisions of National Dairy Development Board Act, 1987 and regulations made thereunder, we further report that:

- a. We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.
- b. The transactions of NDDB, which have come to our notice in course of our audit, have been within the powers of the Board.
- c. In our opinion, the Balance sheet, Income and Expenditure Account and Cash Flow Statement dealt with by this report are in agreement with the books of accounts.
- d. In our opinion, the Standalone Financial Statements comply with the applicable accounting standards, in all material aspects.

For **Khimji Kunverji & Co LLP**

Chartered Accountants

Firm's Registration No: 105146W/W100621

70

Hasmukh B. Dedhia

Partner

Membership No: 033494

ICAI UDIN: 21033494AAAAMG8677

Place: Mumbai

Date: August 10,2021

Khimji Kunverji & Co LLP

Chartered Accountants

Annexure 1 to the Independent Auditors' Report

(referred to in para 6 titled "Auditor's Responsibilities for the Audit of the Standalone Financial Statements")

As part of our audit in accordance with SAs we exercise professional judgment and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the standalone financial statements, whether due to fraud or error, to design and perform audit procedures responsive to those risks and obtain audit evidence for material items that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Board's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management of the Board.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Board's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Board to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit. We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.
- From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our Auditor's Report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")
(A Body corporate constituted under the National Dairy Development Board Act, 1987)

BALANCE SHEET

AS AT 31ST MARCH, 2021

₹ in million

PARTICULARS	ANNEXURE	31.03.2021	31.03.2020
LIABILITIES			
NDDB Funds	I	31,868.88	31,306.01
Secured Loans	II	9,569.32	13,737.72
Current Liabilities and Provisions	III	10,581.54	8,729.55
Deferred Tax Liability	XVI (Note 7)	273.36	235.39
Total		52,293.10	54,008.67
ASSETS			
Cash and Bank Balances	IV	14,290.09	10,633.35
Inventories	V	1.04	0.52
Sundry Debtors		144.05	223.72
Loans, Advances and Other Current Assets	VI	15,757.02	24,700.61
Investments	VII	20,277.98	16,574.20
Property, Plant and Equipment	VIII	1,822.92	1,876.27
Total		52,293.10	54,008.67
Significant Accounting Policies forming part of financial statement	XV		
Notes to Accounts forming part of Financial Statement	XVI		

In terms of our report of even date attached.

For Khimji Kunverji & Co LLP

Chartered Accountants
Firm's Reg No. 105146W/W100621

Hasmukh B Dedhia

Partner
Membership No. 033494

For and on behalf of the Board,

Meenesh C Shah

Chairman & Executive Director

S Regupathi

General Manager
(Accounts)

Mumbai, 10 August 2021

Anand, 04 August 2021

INCOME AND EXPENDITURE ACCOUNT

FOR THE YEAR ENDED ON 31ST MARCH, 2021

₹ in million

PARTICULARS	ANNEXURE	2020-2021	2019-2020
INCOME			
Interest		2,780.16	2,556.69
Service Charges	IX	206.23	295.32
Rent		212.14	219.64
Dividend		60.41	46.87
Other Income	X	210.76	269.73
Total (A)		3,469.70	3,388.25
EXPENDITURE			
Interest and Financial Charges		731.04	526.12
Remuneration and Benefits to Employees	XI	933.27	1,051.25
Administrative Expenses	XII	86.99	137.65
Grants		16.68	34.68
Research and Development		108.75	113.25
Maintenance of Assets	XIII	196.46	213.39
Other Expenses	XIV	86.42	187.34
Provision for contingency		250.00	150.00
Depreciation	VIII	191.17	181.01
Total (B)		2,600.78	2,594.69
Surplus during the year before tax (C) = (A - B)		868.92	793.56
Less: Provision for Taxation			
Current Tax		246.08	213.53
Deferred Tax	XVI (Note 7)	37.97	(87.61)
Surplus during the year after tax		584.87	667.64
Less: Appropriations to -			
Special Reserve		65.53	110.72
Balance carried to NDDDB Funds		519.34	556.92
Total (D) = (B + C)		3,469.70	3,388.25
Significant Accounting Policies forming part of financial statement	XV		
Notes to Accounts forming part of Financial Statement	XVI		

In terms of our report of even date attached.

For Khimji Kunverji & Co LLP

Chartered Accountants
Firm's Reg No. 105146W/W100621

Hasmukh B Dedhia

Partner
Membership No. 033494

For and on behalf of the Board,

Meenesh C Shah

Chairman & Executive Director

S Regupathi

General Manager
(Accounts)

Mumbai, 10 August 2021

Anand, 04 August 2021

CASH FLOW STATEMENT

FOR THE YEAR ENDED ON 31ST MARCH, 2021

PARTICULARS	ANNEXURE	2020-2021	2019-2020
₹ in million			
Cash flow from Operating Activities			
Surplus during the year before tax		868.92	793.56
Adjustments for :			
Depreciation(net of recoupment)		191.17	181.01
Provision for contingency		250.00	150.00
(Profit)/Loss on sale of investments		(65.92)	-
Interest income on fixed deposit and bonds considered separately		(1,547.19)	(1,298.44)
Dividend Income considered separately		(60.41)	(46.87)
Excess provision of PF Trust in FY 2019-2020		(0.14)	-
(Profit)/Loss on sale of fixed assets considered separately		(3.55)	(56.89)
Recoupment of depreciation of grant assets		(22.00)	(16.98)
Employee Retirement Benefit		65.60	199.94
Interest and financial charges to banks		48.23	21.68
Premium Amortised on Bonds and State Development Loans		32.63	44.12
		(1,111.58)	(822.43)
Operating Cash flow before changes in working capital		(242.66)	(28.87)
(Increase)/ Decrease in Inventories		(0.52)	(0.14)
(Increase)/ Decrease in Sundry Debtors		79.67	(38.22)
(Increase)/ Decrease in Loans and Advances		9000.75	(2,541.75)
Increase/(Decrease) in current liabilities		1580.74	150.17
		10660.65	(2,429.94)
Cash flow generated from /(used in) operating activities (A)		10,417.99	(2,458.81)
Tax refunded/(paid)		(305.55)	(225.49)
Net cash flow generated from /(used in) operating activities (A)		10,112.43	(2,684.30)
Cash flow from Investing activities			
Interest Income		1859.07	1,046.61
Dividend Income		60.41	46.87
Proceeds from maturity of investments (Bonds)		2516.90	200.00
Purchase of Investments (Bonds and State Development Loans)		(6,121.48)	(2,295.81)
Decrease / (Increase) in FDR's with banks more than 90 days (net)		(571.12)	(6,540.06)
Proceeds from sale of fixed assets		3.91	69.69
Grant received for purchase of Fixed asset		-	58.38
Purchase of fixed assets		(138.18)	(115.08)
Net cash flow generated from /(used in) investing activities (B)		(2,390.49)	(7,529.40)
Cash flow from Financing activities			
Proceeds / (Repayment) of borrowed funds		(4,168.40)	9,101.61
Interest and financial charges to banks		(48.23)	(21.68)
Net cash flow from financing activities (C)		(4,216.64)	9,079.93
Net Cash flow during the year (A+B+C)		3,505.31	(1,133.77)
Cash and Cash Equivalents at the beginning of the year		231.05	1,364.82
Cash and Cash Equivalents at the end of the year		3,736.36	231.05
Cash and Cash Equivalents			
Balances with Banks:			
In fixed deposits		14,120.57	10,622.82
Less: Deposits with original maturity more than 90 days		10,553.73	10,402.30
		3,566.84	220.52
In current accounts		169.49	10.50
Cash and Cheques on hand		0.03	0.03
Total		3,736.36	231.05
Significant Accounting Policies forming part of financial statement	XV		
Notes to Accounts forming part of Financial Statement	XVI		

Note : Cash Flow Statement has been prepared under the "Indirect Method" as set out in Accounting Standard - 3 on Cash Flow Statements.

In terms of our report of even date attached.

For Khimji Kunverji & Co LLP

Chartered Accountants

Firm's Reg No. 105146W/W100621

For and on behalf of the Board,

Hasmukh B Dedhia

Partner

Membership No. 033494

Meenesh C Shah

Chairman & Executive Director

S Regupathi

General Manager

(Accounts)

Mumbai, 10 August 2021

Anand, 04 August 2021

NDDB Funds

ANNEXURE - I

₹ in million

PARTICULARS	31.03.2021	31.03.2020
General Reserve (Note a)		
Balance as per last balance sheet	3,559.61	3,559.61
Grant for Fixed Assets (Note b)		
Balance as per last balance sheet	102.57	61.17
Add: Grant received during the year	-	58.38
Less: Recoupment of depreciation	22.00	16.98
	80.57	102.57
Special Reserve under section 36 (1) (viii) of the Income Tax Act, 1961		
Balance as per last balance sheet	1,496.69	1,385.97
Add: Transfer from Income and Expenditure Account	65.53	110.72
	1,562.22	1,496.69
Income and Expenditure Account		
Balance as per last balance sheet	26,147.14	25,590.22
Add: Surplus after appropriation during the year	519.34	556.92
	26,666.48	26,147.14
Total	31,868.88	31,306.01

Notes:

- To promote, plan and organise programmes for development of dairy and other agriculture based and allied industries and biologicals as per the NDDB Act, 1987.
- In accordance with Accounting Standard - 12 - 'Accounting for Government Grants'.

Secured Loans

ANNEXURE - II

₹ in million

PARTICULARS	31.03.2021	31.03.2020
Bank Overdraft (Secured against lien on fixed deposits with Banks)	5.43	3,640.83
Loan from NABARD (Secured against loan given under DIDF scheme)	9,563.89	10,096.89
Total	9,569.32	13,737.72

Current Liabilities and Provisions

ANNEXURE - III

₹ in million

PARTICULARS	31.03.2021	31.03.2020
a) Current Liabilities		
Advances and deposits	38.90	50.53
Sundry creditors	259.07	366.52
Net liability on account of Consultancy Project		
Funds received	22,900.59	19,702.42
Add : Due to suppliers for expenses	1,307.88	1,692.33
	24,208.47	21,394.75
Less : Expenditure incurred	20,315.44	17,924.26
Advance to suppliers	17.74	160.82
	3,875.29	3,309.67
Add : Payable to NDDB (Per contra, Refer Annexure VI)	198.80	186.60
	4,074.09	3,496.27
b) Fund received for Government of India projects		
Balance as per last balance sheet	2,450.74	1,363.28
Fund Received	2,323.95	1,348.83
Add: Interest	93.33	50.59
Less: Expenditure incurred	1,224.29	137.84
Less: Advance to End Implementing Agencies	60.57	174.12
	3,583.16	2,450.74
c) Provisions for :		
Non-performing assets (Refer Note 8 of Annexure XVI)	1,006.13	1,039.59
General contingency on Standard Assets (Refer Note 8 of Annexure XVI)	54.30	90.58
Contingency (Refer Note 8 of Annexure XVI)	1,055.81	736.07
	2,116.24	1,866.24
d) Provisions for :		
Leave encashment (Refer Note 4 of Annexure XVI)	148.65	128.63
Post retirement medical scheme (Refer Note 4 of Annexure XVI)	111.16	81.01
Gratuity (Refer Note 4 of Annexure XVI)	37.64	31.21
VRS monthly benefits	0.04	1.31
	297.49	242.16
Provisions for income tax (net of taxes paid)	212.59	257.09
Total	10,581.54	8,729.55

Cash and Bank Balances

ANNEXURE - IV

₹ in million

PARTICULARS	31.03.2021	31.03.2020
Balances with Banks		
In fixed deposits	14,120.57	10,622.82
In current accounts	169.49	10.50
	14,290.06	10,633.32
Cash and cheques on hand	0.03	0.03
Total	14,290.09	10,633.35

Note :

Fixed deposits includes

- ₹ 7034.07 million (Previous Year ₹ 5911.76 million) placed with Banks which are under lien for the overdraft facility
- ₹ 716.40 million (Previous Year ₹ 700.20 million) which are under lien in favour of NABARD for the DSRA account opened for loans availed under DIDF scheme
- ₹ 0.05 million (Previous Year ₹ 0.05 million) for Bank Guarantee Margin Money.
- ₹ 3,427.80 million (Previous Year ₹ 2485.83 million) of fund received for Government of India projects.
- Current accounts include ₹ 143.50 million (Previous Year ₹ 5.00 million) of fund received for Government of India projects.

Inventories

ANNEXURE - V

₹ in million

PARTICULARS	31.03.2021	31.03.2020
Stores, spares and others	2.16	1.64
Project equipments	3.19	3.19
	5.35	4.83
Less : Provision for obsolescence	4.31	4.31
	1.04	0.52
Total	1.04	0.52

Loans, Advances and Other Current Assets

ANNEXURE - VI

₹ in million

PARTICULARS	31.03.2021	31.03.2020
Loans to cooperatives		
Milk - Secured	10,367.27	14,862.46
Unsecured	960.78	1,690.93
	11,328.05	16,553.39
Oil (including interest accrued) - Unsecured	945.03	945.03
Loans and advances to subsidiary companies / managed units		
Secured	1,377.63	1,663.13
Unsecured	529.10	4,070.83
	1,906.73	5,733.96
Loans to employees		
Secured	0.27	0.39
Unsecured	5.85	6.25
	6.12	6.64
Interest accrued on -		
Loans and advances	4.92	16.69
Fixed deposits and investments	372.59	282.19
	377.51	298.88
Advances to suppliers and contractors	6.20	4.13
Recoverable on account of turnkey projects (Per contra, Refer Annexure III)	198.80	186.60
Sundry deposits	17.33	17.57
Income taxes paid (net of provisions)	960.63	945.65
Other receivables	10.62	8.76
Total	15,757.02	24,700.61

Notes :

- Secured loans are secured against the mortgage of assets and/or hypothecation of stocks/assets.
- Secured loans includes ₹ 7878.55 million (Previous Year ₹ 7604.66 million) given under DIDF scheme.

Investments

ANNEXURE - VII

₹ in million

PARTICULARS	31.03.2021	31.03.2020
Long term investments (at cost) :		
Equity Shares (unquoted) in subsidiary companies:		
Mother Dairy Fruit and Vegetable Private Limited (MDFVPL)	2,500.00	2,500.00
IDMC Limited (IDMC)	283.90	283.90
Indian Immunologicals Limited (IIL)	90.00	90.00
NDDDB Dairy Services (NDS)	2,000.00	2,000.00
	4,873.90	4,873.90
Bonds (Quoted) of Government companies, financial institutions and banks (at cost) (aggregate market value of bonds is ₹ 11205.02 million (Previous Year ₹ 8547.96 million) as at the balance sheet date)	11,241.34	8,456.39
State Development Loans (Quoted) (at cost) (aggregate market value of State Development Loans is ₹ 4297.67 million (Previous Year ₹ 3359.16 million) as at the balance sheet date)	4,143.84	3,225.01
Shares (unquoted) in Co-operatives and Federations	19.00	19.00
Less: Provision for diminution in value of investments	0.10	0.10
	18.90	18.90
Total	20,277.98	16,574.20

Property, Plant and Equipment

ANNEXURE - VIII

₹ in million

PARTICULARS	Gross Block (at Cost)			Depreciation			Net Block	
	As at 01.04.2020	Addition	Deduction/ (adjustments)	As at 31.03.2021	For the year (adjustments)	As at 31.03.2021	As at 31.03.2021	As at 31.03.2020
Free Hold Land (Refer Note 1 to 3)	456.45	-	-	456.45	-	-	456.45	456.45
Lease Hold Land	64.16	-	-	64.16	0.75	14.55	49.61	50.36
Buildings and Roads	2,002.89	9.64	-	2,012.53	52.56	1,178.42	834.11	877.03
Plant and Machinery	53.82	-	-	53.82	0.25	53.29	0.53	0.78
Electrical Installations	183.20	4.34	1.04	186.50	8.40	136.35	50.15	54.30
Furniture, Computers and Others Equipments	1,187.62	128.77	10.30	1,306.09	109.55	1,023.06	283.03	264.08
Rail Milk Tankers	384.54	-	13.48	371.06	18.40	236.97	134.09	152.49
Vehicles	22.79	-	0.39	22.40	1.26	19.48	2.92	4.18
Total	4,355.47	142.75	25.21	4,473.01	191.17	2,662.12	1,810.89	1,859.67
Previous Year	4,195.43	194.20	34.15	4,355.47	181.01	2,495.81	1,859.66	1,859.28
Capital Work in Progress including capital advances							12.03	16.60
Total Fixed Assets							1,822.92	1,876.27

Notes :

1. Land for FMD Control Project amounting to ₹ 0.39 million is obtained from Government of Tamil Nadu by alienation.
2. Freehold land includes land for Oil Tank farm, Narela amounting to ₹ 17.94 million which has been obtained on perpetual lease for which lease deeds are yet to be executed.
3. Land amounting to ₹ 65.98 million at Kannamangala Horticulture Farm received from Agriculture and Horticulture Department, Government of Karnataka is in the Name of the subsidiary company Mother Dairy Fruit and Vegetable Private Limited and transfer of title is pending.

Service Charges

ANNEXURE - IX

₹ in million

PARTICULARS	2020-2021	2019-2020
Training fees	1.07	16.55
Procurement and technical service fees	112.65	197.10
Testing charges	90.75	66.67
Fees from consultancy and feasibility studies	0.49	13.26
Royalty and process knowhow fees	1.27	1.74
Total	206.23	295.32

Other Income

ANNEXURE - X

₹ in million

PARTICULARS	2020-2021	2019-2020
Profit on sale of fixed assets (net)	3.55	56.89
Profit on sale of investments	65.92	-
Other interest income	29.82	24.41
Excess provision and NPAs written back	3.69	-
Recoupment of depreciation of grant assets	22.00	16.98
Miscellaneous income	85.78	171.45
Total	210.76	269.73

Remuneration and Benefits to employees

ANNEXURE - XI

₹ in million

PARTICULARS	2020-2021	2019-2020
Salaries and Wages (including ex-gratia)	729.37	806.27
Contribution to Provident, Superannuation fund and Gratuity	116.15	175.47
Staff welfare expenses	87.75	69.51
Total	933.27	1,051.25

Remuneration excludes ₹ 23.95 million (Previous year : ₹ 25.65 million) shown as part of Research and Development expenses.

Administrative Expenses

ANNEXURE - XII

₹ in million

PARTICULARS	2020-2021	2019-2020
Printing and stationery	3.13	5.80
Communication charges	9.77	9.42
Audit fees and expenses (including taxes)		
Audit fees	0.87	0.76
Income Tax audit	0.27	0.27
Goods & service tax audit	0.21	0.21
Out of pocket expenses	0.01	0.02
	1.36	1.26
Legal fees	4.93	3.98
Professional fees	14.58	12.58
Vehicle expenses	1.67	3.59
Recruitment expenses	0.04	0.70
Advertisement expenses	2.32	5.84
Travelling and conveyance expenses	21.45	63.63
Electricity and rent	24.55	26.96
Other administrative expenses	3.19	3.89
Total	86.99	137.65

Maintenance of Assets

ANNEXURE - XIII

₹ in million

PARTICULARS	2020-2021	2019-2020
Repairs and maintenance		
Buildings	130.30	141.21
Others	55.54	60.70
Rates and taxes	8.12	9.32
Insurance	2.50	2.16
Total	196.46	213.39

Other Expenses

ANNEXURE - XIV

₹ in million

PARTICULARS	2020-2021	2019-2020
Training expenses	16.63	35.34
Computer expenses	17.41	14.14
Prior period expenses	1.68	1.23
Other expenditure	50.70	136.63
Total	86.42	187.34

Significant Accounting Policies forming part of financial Statement

Annexure XV

1. Basis of preparation

The financial statements are prepared on accrual basis, using the historical cost convention and Generally Accepted Accounting Principles ("GAAP") in India including accounting standards issued by the Institute of Chartered Accountants of India, as applicable to the Board. The financial statements are presented in Indian Rupees rounded off to the nearest million, unless otherwise stated.

2. Use of Estimates

The preparation of financial statements in conformity with the GAAP requires the management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenues and expenses and the disclosure of contingent liabilities as at the date of the financial statements. Such estimates and assumptions are based on the Management's evaluation of relevant facts and circumstances as on the date of the financial statements. Management believes that the estimates used in the preparation of the financial statements are prudent and reasonable; however the actual outcome may diverge from this estimate which is recognized prospectively in the current and future periods. Any changes in such estimates are recognized prospectively in current and future period.

3. Asset Classification and Provisioning

NDDB being a Public Financial Institution follows the guidelines of Reserve Bank of India (RBI) for asset classification applicable to "Systemically Important Non-Banking Financial (Non-Deposit Accepting or Holding) Companies Prudential Norms, 2015". Provision for Non-Performing and Standard Assets is made at the rates approved by the Board.

4. Revenue Recognition

Interest income on standard assets in accordance with the RBI guidelines is recognized on an accrual basis. Interest income from non-performing assets classified in conformity with the guidelines is accounted on cash basis upon realisation.

Interest income on fixed deposits with Bank and investment in Bonds is recognized on a time proportionate basis.

Income from Services to co-operatives etc. is recognized on proportionate completion basis and in accordance with the terms of relevant agreement.

Sale of milk commodities is accounted for on transfer of substantial risk and rewards, which is on dispatch of the commodities from the warehouse.

Dividend income is accounted for when unconditional right to receive income is established.

Other income is recognized when there is no uncertainty as to its ultimate collectability.

5. Grants

a. Grants relating to fixed assets are initially credited to Grant for Fixed Assets under the General Fund. This amount is recognized in the Income and Expenditure Account on a systematic basis over the useful life of such fixed asset as a recoupment of depreciation on such assets.

b. Revenue grants received during the year are recognized in the Income and Expenditure Account.

c. Grants received for specific projects are credited to the Project Funds and is utilized by disbursements for these projects.

6. Research and Development Expenditure

Research and Development Expenditure (other than cost of fixed assets acquired) are charged as expenses in the year in which they are incurred. Fixed assets used for the Research and Development purpose with alternate use is depreciated over its useful life based on the Board's policy.

Significant Accounting Policies forming part of financial Statement

Annexure XV

7. Employee Benefits

- a. Defined Contribution Plan: Contribution to Provident Fund and Superannuation Fund is made at a predetermined rate and is charged to Income and Expenditure account. Shortfall if any, between the rate prescribed by the Employees' Provident Fund Organisation and actual earnings of National Dairy Development Board Staff Provident Fund Scheme, is contributed by the Board as debit to Income & Expenditure account.
- b. Defined Benefit Plans: The Board's liabilities towards gratuity, compensated absences and post-retirement medical benefit schemes are determined using the projected unit credit method which considers each period of service giving rise to an additional unit of benefit entitlement and measures each unit separately to build up final obligation. Actuarial gains and losses based on actuarial valuation done by the independent actuary carried out annually are recognized immediately in the Income and Expenditure account as income or expense. Obligation is measured at the present value of estimated future cash flows using a discounted rate that is determined by reference to the market yields at the Balance sheet date on the Government bonds where the currency and terms of Governments bonds are consistent with the currency and estimated terms of defined benefit obligation.

Compensated absences: The Board has a scheme for compensated absences benefit for employees, the liability for which is determined on the basis of an actuarial valuation carried out at the end of the year.

The Board has funded its liability towards gratuity by participating in Group Gratuity cum Life Assurance Scheme of Life Insurance Corporation of India.

8. Property, Plant & Equipment (PPE) and Depreciation

Tangible fixed assets are carried at cost less depreciation and impairment loss. Cost comprises of purchase price, import duties and other non-refundable taxes or levies and any directly attributable costs to bring the asset ready for its intended use.

Depreciation on PPE costing more than ₹ 10,000 each is charged on Straight Line Method basis at the rates fixed by the Board. Depreciation is charged for the full year in the year of capitalization and no depreciation is charged in the year of disposal. Each asset costing ₹ 10,000 or less is depreciated at 100 percent in the year of purchase. Depreciation rates, as approved by the Board, for various classes of assets are as under:

Assets	Rate (in %)
Factory buildings, Godown and Roads	4.00
Other buildings	2.50
Cold storage	15.00
Electrical installation	5.00
Computers (including software)	33.33
Office and Lab equipment	15.00
Plant and machinery	10.00
Solar equipment	30.00
Furniture	10.00
Vehicles	20.00
Rail milk tankers	10.00

Leasehold Land is amortized over the duration of lease. Depreciation on the assets located on leasehold land shall be at lower of lease duration or useful life of that asset.

Capital assets under installation / construction are stated in Balance Sheet as "Capital Work in Progress".

Significant Accounting Policies forming part of financial Statement

Annexure XV

9. Impairment of Assets

The carrying value of assets at each Balance Sheet date is reviewed for impairment of assets. If any indication of such impairment exists, the recoverable amount of such asset is estimated and impairment is recognized, if the carrying amount of these assets exceeds the recoverable amount. The recoverable amount is greater of net selling price and their value in use. Value in use is arrived at by discounting their future cash flows to their present value based on appropriate discount factor. When there is indication that an impairment loss recognized for an asset in prior accounting periods no longer exists or may have decreased such reversal of impairment loss is recognized in Income and Expenditure Account.

10. Investments

Long-term investments are valued as under:

- a) Shares in Subsidiaries, Co-operatives and Federations – at cost of acquisition;
- b) Debentures / bonds in Government Companies, Financial Institutions and Banks / State Development Loans - at cost of acquisition net of amortised premium, if any.

Current investments are valued at lower of cost or market value.

Long term Investments are valued at cost. In case cost price is higher than the face value, the premium is amortised over the remaining period of maturity of the underlying security. Such investments are stated in balance sheet at acquisition price less amortised premium.

Provision for any diminution other than temporary in value of investments is made in the year in which such diminution is assessed.

11. Inventories

Inventories including stores and project equipment are valued at cost or net realizable value whichever is lower, cost being worked out on first-in-first-out basis. Provision for obsolescence is made, wherever necessary.

12. Foreign Currency Transactions

Transactions in foreign currencies are recorded at the exchange rate prevailing on the date of the transactions.

Monetary items denominated in foreign currency and outstanding at the Balance Sheet date are translated at the exchange rate prevailing at the year-end. Non-monetary items are carried at historical cost.

Exchange differences arising on foreign currency transactions are recognised as income or expense in the period in which they arise.

13. Accounting for Voluntary Retirement scheme

The cost of voluntary retirement scheme including ex-gratia is charged to the Income and Expenditure Account in the period of separation of employees. A provision for Monthly Benefit Scheme is made for the employees opting for the voluntary retirement scheme in the period of separation of employees and the same is adjusted against the payments made.

14. Taxes on Income

Current tax is the amount payable on the taxable income for the year as determined in accordance with the provisions of the Income Tax Act, 1961.

Deferred Tax is recognized on timing differences, being the differences between the taxable income and the accounting income that originate in one period and are capable of reversal in one or more subsequent periods.

Deferred Tax Assets in respect of unabsorbed depreciation and carry forward losses are recognized if there is a virtual certainty that there will be sufficient future taxable income available to set-off such tax losses. Other deferred tax assets are recognized when there is reasonable certainty that there will be sufficient future taxable income to realize such assets.

Significant Accounting Policies forming part of financial Statement

Annexure XV

15. Leases

Lease arrangements where the risks and rewards incidental to ownership of an asset vest substantially with the lessor are recognized as operating leases. Lease rent under operating leases are recognized in the Income & Expenditure Account with reference to lease terms.

16. Provisions and Contingencies

A provision is recognized when the Board has a present obligation as a result of past events and it is probable that an outflow of resources will be required to settle the obligation, in respect of which a reliable estimate can be made. Provisions (excluding retirement benefits) are not discounted to their present value and are determined based on the estimate required to settle the obligation at the Balance Sheet date. These are reviewed at each Balance Sheet date and are adjusted to reflect the current best estimates. Contingent liabilities are disclosed in Notes to Accounts.

The Board created provisions in respect of loans and other assets prior to the year 2001-02. Based on the movement in underlying assets for which such provision was created, Board reallocates / write back, such provisions based on identified events. Accordingly, the Board creates additional provision or makes allocation of exiting contingency provision for possible diminution in value of its asset or for unforeseen events leading to such liability.

Notes to Accounts forming part of the Financial Statement

Annexure XVI

1 At the request of the concerned authorities, the NDDDB has been managing West Assam Milk Producers' Co-operative Union Ltd., Jharkhand State Cooperative Milk Producers' Federation Ltd. and Shahjahanpur Mahila Dugdh Utpadak Sahakari Sangh Ltd. These are separate and independent entities and their accounts are maintained by the respective authorities and audited separately.

2 Contingent Liabilities:

2.1. Principal amount of claims not acknowledged as debt : ₹ 232.73 million (Previous Year : ₹ 29.36 million)

2.2. Guarantees outstanding : ₹ 0.05 million (Previous Year : ₹ 0.05 million)

2.3. Income tax demands (excluding interest and penalty applicable under respective statutory provisions) ₹ 1078.02 million (Previous Year : ₹ 1085.56 million)

2.4. Service tax demands ₹ 916.50 million (Previous Year: ₹ 916.50 million)

2.5. Other Demands

		₹ in million	
PARTICULARS	AUTHORITY	2020-21	2019-20
Settlement of Land dues	Land and Land Reform Department, Siliguri	0.39	0.39
Demand for Municipal Tax for Land at Itola	Taluka Development Officer, Vadodara	4.73	4.73

Demands presented hereinabove at 2.3 to 2.5 have been contested by the Board before appropriate forums. Future cash flows in respect of the same are determinable only on outcome of judgment / decision of the forums where the demands are contested.

3 Segment information:

NDDDB is a body corporate constituted under the National Dairy Development Board Act, 1987. As per the objectives set out in the Act, all the activities of NDDDB revolve around the Dairy/Agriculture sector which in terms of Accounting Standard-17 on "Segment Reporting" constitute a single reportable segment.

4 Disclosure as per Accounting Standard 15 (Revised 2005) regarding Employee Benefits is as under:

Employee benefit plans

Defined Contribution Plans

The Company makes Provident Fund and Superannuation Fund contributions to defined contribution plans for qualifying employees. Under the Schemes, the Company is required to contribute a specified percentage of the payroll costs to fund the benefits. The Company recognised ₹ 64.68 million (Year ended 31 March, 2020 ₹ 64.44 million) for Provident Fund contributions and ₹ 43.20 million (Year ended 31 March, 2020 ₹ 43.25 million) for Superannuation Fund contributions in the Income and Expenditure Account. The contributions payable to these plans by the Company are at rates specified in the rules of the schemes.

Defined Benefit Plans

The Company offers the following employee benefit schemes to its employees:

- i. Gratuity
- ii. Post-Retirement medical benefits schemes (PRMBS)

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")

iii. Leave Encashment

The following table sets out the funded status of the defined benefit schemes and the amount recognised in the financial statements:

(₹ in million)

Particulars	Year ended 31 March, 2021			Year ended 31 March, 2020		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
Components of employer expense						
Current service cost	31.30	-	35.69	31.23	-	33.07
Interest cost	30.33	5.47	35.24	30.18	5.42	32.47
Expected return on plan assets	(29.78)	-	(27.34)	(28.18)	-	(16.50)
Actuarial losses/(gains)	(23.47)	27.94	(25.11)	34.70	9.34	68.21
Total expense recognised in the Statement of Profit and Loss	8.38	33.41	18.48	67.93	14.76	117.25
Actual contribution and benefit payments for year						
Actual benefit payments	(28.48)	(3.26)	(25.75)	(36.26)	(3.73)	(30.70)
Actual contributions	1.96	-	(1.54)	54.30	-	388.14
Net asset / (liability) recognised in the Balance Sheet						
Present value of defined benefit obligation	(458.98)	(111.16)	(542.14)	(449.30)	(81.01)	(522.08)
Fair value of plan assets	421.34	-	393.49	418.09	-	393.45
Net asset / (liability) recognised in the Balance Sheet	(37.64)	(111.16)	(148.65)	(31.21)	(81.01)	(128.63)
Change in defined benefit obligations (DBO) during the year						
Present value of DBO at beginning of the year	449.30	81.01	522.08	389.45	69.98	419.02
Current service cost	31.30	-	35.68	31.23	-	33.08
Interest cost	30.33	5.47	35.24	30.18	5.42	32.47
Actuarial (gains) / losses	(23.47)	27.94	(25.11)	34.70	(3.73)	68.21
Benefits paid	(28.48)	(3.26)	(25.75)	(36.26)	9.34	(30.70)
Present value of DBO at the end of the year	458.98	111.16	542.14	449.30	81.01	522.08
Change in fair value of assets during the year						
Plan assets at beginning of the year	418.09	-	393.45	371.87	-	-
Acquisition adjustment	-	-	-	-	-	-
Expected return on plan assets	29.77	-	27.33	28.18	-	16.51
Actual company contributions (Excluding Contribution made by Gratuity Trust/NDDB and charges deducted by LIC)	1.96	-	(1.54)	54.30	-	388.14
Actuarial gain / (loss)	-	-	-	-	-	-
Benefits paid	(28.48)	-	(25.75)	(36.26)	-	(11.20)
Plan assets at the end of the year	421.34	-	393.49	418.09	-	393.45

(₹ in million)

Particulars	Year ended 31 March, 2021			Year ended 31 March, 2020		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
Actual return on plan assets	29.78	-	-	28.18	-	-
Composition of the plan assets is as follows:						
Government bonds	50%	-	50%	50%	-	50%
PSU bonds	45%	-	45%	45%	-	45%
Equity & Equity related Investments	5%	-	5%	5%	-	5%
Others	0%	-	0%	0%	-	0%
Actuarial assumptions						
Discount rate	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%
Expected return on plan assets	7.62%	NA	7.37%	8.14%	NA	7.70%
Salary escalation	8.50%	3.00%	8.50%	8.50%	3.00%	8.50%
Attrition	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Medical cost inflation	NA	5% FOR B1, 3% FOR B2 & B3	NA	NA	5.00%	NA
Mortality tables	Indian Assured Lives (2012-14) ultimate Mortality Rates	Indian Assured Lives (2012-14) ultimate Mortality Rates and indian Individual Annuitant's Mortality Table (2012-15)	Indian Assured Lives (2012-14) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured ultimate Mortality Rates and LIC Annuitants (1996-98) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates

Experience adjustments

(₹ in million)

Particulars	2020-21	2019-20	2018-19	2017-18	2016-17	2015-2016
Gratuity						
Present value of DBO	458.98	449.30	389.45	357.02	362.20	291.71
Fair value of plan assets	(421.34)	(418.09)	(371.87)	(341.48)	(329.18)	(280.44)
Funded status [Surplus / (Deficit)]	(37.64)	(31.21)	(17.58)	(15.54)	(33.02)	(11.27)
Post-Retirement medical benefits schemes (PRMBS)						
Present value of DBO	111.16	81.01	69.98	71.19	73.38	76.84
Other defined benefit plans (Leave Encashment)						
Present value of DBO	542.14	522.08	419.02	379.07	366.17	280.18
Fair value of plan assets	(393.49)	(393.45)	-	-	-	-
Funded status [Surplus / (Deficit)]	(148.65)	(128.63)	-	-	-	-

Particulars	For the year ended 31 March, 2021	For the year ended 31 March, 2020
Actuarial assumptions for long-term compensated absences		
Discount rate	6.75%	6.75%
Expected return on Gratuity plan assets	7.62%	8.14%
Expected return on Leave Encashment plan assets	7.37%	7.70%
Salary escalation	8.50%	8.50%
Attrition	1.00%	1.00%

The discount rate is based on the prevailing market yields of Government of India securities as at the Balance Sheet date for the estimated term of the obligations.

The estimate of future salary increases considered, takes into account the inflation, seniority, promotion, increments and other relevant factors.

The contribution expected to be made by the Board during FY 2020-21 has not been ascertained.

5 Disclosure of related party and Transactions with them for the year ended 31st March, 2021 as per Accounting Standard 18

a) Related Party and their relationship

1) Wholly owned subsidiaries

IDMC Limited
Indian Immunologicals Limited
Mother Dairy Fruit and Vegetable Private Limited
NDDDB Dairy Services
Pristine Biologicals (NZ) Limited (wholly owned subsidiary of Indian Immunologicals Limited)

2) Other enterprises where management has significant influence over the management

The West Assam Milk Producers' Co-operative Union Ltd.
Animal Breeding Research Organisation (India)
Anandalaya Education society
Jharkhand State Cooperative Milk Producers' Federation Ltd.
NDDDB Foundation for Nutrition
Shahjahanpur Mahila Dugdh Utpadak Sahakari Sangh Ltd.

3) Key management personnel

Mr. Dilip Rath Chairman till 30th November 2020
Ms. Varsha Joshi Chairman from 1st December 2020
Mr. Meenesh Shah Executive Director

b) Transactions with related parties

(figures in italic represent previous year figures)

Particulars	Interest Income	Purchase of Fixed Assets	Dividend	Rent (Income)	Other income	Grant	Other Expenditure	Current Account Balance outstanding Dr/(Cr)	Loan repaid / Adjusted			Loan Balance outstanding Dr/(Cr)
									Principal	Interest	Disbursed	
Subsidiary Companies												
IDMC Limited	35.03	-	24.29	0.59	0.11	-	0.04	0.05	11.96	71.98	35.03	461.69
	<i>35.80</i>	-	<i>24.29</i>	<i>0.84</i>	<i>0.11</i>	-	<i>0.15</i>	<i>0.06</i>	<i>165.01</i>	<i>27.46</i>	<i>35.80</i>	<i>521.71</i>
Indian Immunologicals Limited	67.23	-	36.00	26.65	0.17	-	5.20	5.28	581.45	812.75	67.23	834.41
	<i>77.52</i>	-	<i>22.50</i>	<i>26.65</i>	<i>0.39</i>	-	<i>5.17</i>	<i>4.44</i>	<i>224.23</i>	<i>88.16</i>	<i>77.52</i>	<i>1,065.72</i>
Mother Dairy Fruit and Vegetable Private Limited	140.91	-	-	125.46	3.18	-	-	44.20	1,140.91	4,640.91	140.91	-
	<i>21.59</i>	-	-	<i>126.37</i>	<i>4.81</i>	-	<i>0.13</i>	<i>35.55</i>	<i>3,500.00</i>	-	<i>21.59</i>	<i>3,500.00</i>
NDDDB Dairy Services	-	-	-	4.42	0.55	-	-	0.19	-	40.50	-	529.10
	-	<i>0.12</i>	-	<i>8.72</i>	<i>1.02</i>	-	<i>0.03</i>	<i>6.55</i>	-	<i>55.40</i>	-	<i>569.60</i>
Total	243.17	-	60.29	157.12	4.01	-	5.24	49.72	1,734.32	5,566.14	243.17	1,825.20
	<i>134.91</i>	<i>0.12</i>	<i>46.79</i>	<i>162.58</i>	<i>6.33</i>	<i>-</i>	<i>5.48</i>	<i>46.60</i>	<i>3,889.24</i>	<i>171.02</i>	<i>134.91</i>	<i>5,657.03</i>
Other enterprises where management has significant influence over the management												
The West Assam Milk Producers' Co-operative Union Ltd.	1.07	-	-	0.07	0.51	-	0.10	0.45	42.81	48.22	1.07	16.52
	<i>0.57</i>	-	-	<i>0.94</i>	<i>4.37</i>	<i>0.16</i>	<i>0.49</i>	<i>0.05</i>	<i>24.14</i>	<i>4.65</i>	<i>0.57</i>	<i>21.93</i>
Animal Breeding Research Organisation	3.85	-	-	-	3.50	-	-	13.15	18.85	8.85	3.85	65.00
	<i>2.06</i>	-	-	-	<i>2.22</i>	-	<i>0.01</i>	<i>8.08</i>	<i>55.00</i>	-	<i>2.06</i>	<i>55.00</i>
Anandalaya Education Society	-	-	-	0.92	-	-	0.02	0.16	-	-	-	-
	-	-	-	<i>0.76</i>	-	-	<i>0.03</i>	<i>0.15</i>	-	-	-	-
Jharkhand State Cooperative Milk Producers' Federation Ltd.	-	-	-	-	0.13	-	-	(0.07)	-	-	-	-
	-	-	-	<i>0.26</i>	<i>1.65</i>	<i>0.08</i>	<i>0.02</i>	<i>0.67</i>	-	-	-	-
Total	4.92	-	-	0.99	4.14	-	0.12	13.69	61.66	57.07	4.92	81.52
	<i>2.63</i>	<i>-</i>	<i>-</i>	<i>1.96</i>	<i>8.24</i>	<i>0.24</i>	<i>0.55</i>	<i>8.95</i>	<i>79.14</i>	<i>4.65</i>	<i>2.63</i>	<i>76.93</i>

Remuneration to key management personnel

	(₹ in million)
Mr. Dilip Rath	2.60
	3.57
Mr. Sangram R Chaudhary	-*
	0.92
Mr. Y Y Patil	- **
	8.41
Mr. Meenesh Shah	4.66
	4.32
Total	7.26
	17.22

* Executive Director upto 30th April 2019

**Executive Director upto 31st May 2019

6 Disclosure as per Accounting Standard 19 – ‘Leases’ (Refer Annexure VIII):

Operating lease arrangements entered into by the Board as a Lessor for following assets:

a) Nature of Assets leased

Class of Asset	(₹ in million)		
	Gross value of assets as at 31st March, 2021	Depreciation for the year	Accumulated Depreciation as at 31st March, 2021
Buildings and Roads#	1629.79	42.92	990.22
	<i>1629.79</i>	<i>42.98</i>	<i>947.30</i>
Electrical Installations#	30.86	1.00	26.12
	<i>30.86</i>	<i>1.17</i>	<i>25.12</i>
Furniture, fixtures, computers, software and office equipment	7.92	0.10	7.92
	<i>7.92</i>	<i>0.16</i>	<i>7.82</i>
Rail Milk Tankers	348.45	16.89	226.45
	<i>361.61</i>	<i>16.16</i>	<i>228.55</i>
Total	2017.02	60.91	1250.71
	<i>2030.18</i>	<i>60.47</i>	<i>1208.79</i>

including staff quarters and cold storage
(Figures in italics represent previous year figures)

These arrangements are cancellable with prior notice to the lessee.

b) Initial Direct cost relating to leasing arrangements is charged to Income and Expenditure account in the year of arrangement of lease.

c) Significant Leasing arrangements:

All assets mentioned above are leased out to subsidiaries, federations and others with an option to renew or cancellation of the agreement.

7 Deferred tax assets have been recognised as per Accounting Standard 22–‘Accounting for Taxes on Income’. Details are as under:

(₹ in million)

Particulars	Opening Balance as at 1st April, 2020	Adjustment during the year	Closing Balances at 31st March, 2021
Deferred Tax Assets /(Liability):			
Depreciation	(19.84)	(2.85)	(22.69)
	<i>(7.90)</i>	<i>(11.94)</i>	<i>(19.84)</i>
Expenditure allowable on payment basis	152.95	(19.93)	133.02
	<i>159.94</i>	<i>(6.99)</i>	<i>152.95</i>
Gratuity	7.85	1.62	9.47
	<i>6.14</i>	<i>1.71</i>	<i>7.85</i>
Voluntary Retirement Scheme	0.33	(0.32)	0.01
	<i>3.13</i>	<i>(2.80)</i>	<i>0.33</i>
Special Reserve	(376.68)	(16.49)	(393.17)
	<i>(484.31)</i>	<i>107.63</i>	<i>(376.68)</i>
TOTAL	(235.39)	(37.97)	(273.36)
	<i>(323.00)</i>	<i>87.61</i>	<i>(235.39)</i>

(Figures in italic represent previous year figures)

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8 Disclosure as per Accounting Standard 29 – ‘Provisions, Contingent Liabilities and Contingent Assets’ is as follows:

(₹ in million)

Particulars	Non-Performing Asset (NPA)	General Contingency on Standard Assets	Contingency
Opening balance	1,039.59	90.58	736.07
	<i>1,075.72</i>	<i>79.28</i>	<i>561.24</i>
Created during the year from contingency	0.34	(36.28)	35.94
	<i>0.15</i>	<i>11.30</i>	<i>(11.45)</i>
Created during the year for contingency	-	-	250.00
	-	-	<i>150.00</i>
Reversed/movement during the year	(33.80)	-	33.80
	<i>(36.28)</i>	-	<i>36.28</i>
Closing balance	1,006.13	54.30	1055.81
	<i>1,039.59</i>	<i>90.58</i>	<i>736.07</i>

(Figures in italic represent previous year figures)

9 Based on the information available with Board as on 31st March 2021, there were outstanding of ₹ 30.07 million (Previous Year: ₹ 4.22 million) and no overdue to the entities that are classified as Micro and Small Enterprises under the Micro, Small and Medium Enterprises Development Act, 2006.

- 10 A) In accordance with the RBI notification dated April 7, 2021, the Board is required to refund/adjust 'interest on interest' charged to the borrowers during the moratorium period, i.e. March 1, 2020 to August 31, 2020. The Board had not charged "interest on interest" to any of its borrowers during the said period and hence it does not necessitate any interest refund / adjustment.
- B) Disclosure in respect of RBI circular on "COVID19 Regulatory Package - Asset Classification and Provisioning" dated April 17, 2020 having reference number RBI/2019-20/220 DOR.No.BP.BC.63/21.04.048/2019-20 as per para 10

(₹ in million)

Particulars	As at 31st March, 2021	As at 31st March, 2020
Respective amounts in SMA/overdue categories, where the moratorium/deferment was extended, in terms of paragraph 2 and 3 of the RBI Circular;	0.00	2.35
Respective amount where asset classification benefits is extended as at March 31,2020	0.00	0.00
Provisions made during the Q4 FY2020 and Q1 FY2021 in terms of paragraph 5 of the RBI Circular	Not Applicable	Not Applicable
Provisions adjusted during the respective accounting periods against slippages and the residual provisions in terms of paragraph 6	0.00	0.00

- C) The disclosure as per format prescribed under notification no RBI/2020-2021/16 DOR No BPBC/3/21.04.048/2020-21 for the year ended 31st March, 2021 is not applicable for the Board for the year under report.

- 11 The management of the Board assessed the impact of the COVID19 considering its internal and external inputs. In the opinion of the management of the Board, based on information presently available, the impact on the reported numbers and impairment of the assets would not be significant. In long term, the Board does not anticipate any major challenge in meeting its financial obligations as going concern.

- 12 The figures of the previous year have been regrouped/re-arranged wherever necessary.

In terms of our report of even date attached.

For Khimji Kunverji & Co LLP

Chartered Accountants
Firm's Reg No. 105146W/W100621

Hasmukh B Dedhia

Partner
Membership No. 033494

Mumbai, 10 August 2021

For and on behalf of the Board,

Meenesh C Shah

Chairman & Executive Director

Anand, 04 August 2021

S Regupathi

General Manager
(Accounts)

NDDB Officers

(As on March 31, 2021)

Head Office, Anand

Chairman & Chief Executive

Varsha Joshi

M Sc (Physics)

Executive Director

Meenesh C Shah

B Sc (DT), PGDRDM

Arun Raste

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Automated Dairy Plant Project,
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Abbreviations

GEN MGR: General Manager

DY GEN MGR: Deputy
General Manager

SR SCI: Senior Scientist

SR MGR: Senior Manager

SCI III: Scientist III

MGR: Manager

SCI II: Scientist II

DY MGR: Deputy Manager

SCI I: Scientist I

Glossary

AI – Artificial Insemination	EFS – Extended Frozen Semen	IRMA – Institute of Rural Management, Anand
AMR - Antimicrobial Resistance	EIAs – End Implementing Agencies	IVEP – In Vitro Embryo Production
APART - Assam Agribusiness and Rural Transformation Project	EIC – Exports Inspection Council	JMF – Jharkhand Milk Federation
ARIAS - The Assam Rural Infrastructure and Agricultural Services Society	ESAP - Environment and Social Action Plan	Kg – Kilogram
BB – Bovine Brucellosis	EVM – Ethno-Veterinary Medicine	LCP – Least Cost Formulation
BCP - Brucellosis Control Programme	eWG - e-Working Group	LKGPD – Lakh Kilograms Per Day
BDV – Bovine Viral Diarrhoea	FMD – Foot and Mouth Disease	LLPD – Lakh Litres Per Day
BGC – Bovine Genital Campylobacteriosis	FMD-CP - Foot and Mouth Disease Control Programme	LRP – Local Resource Person
BIS – Bureau of Indian Standards	FoPL – Front-of-Pack Labelling	MAFSU - Maharashtra Animal & Fishery Sciences University
BMC – Bulk Milk Cooler	FSSAI – Food Safety and Standards Authority of India	MAITs – Mobile AI Technicians
CAC – Codex Alimentarius Committee	GEBV - genomic estimated breeding values	MCPP – Mastitis Control Popularisation Project
CCBF- Central Cattle Breeding Farms	Gol – Government of India	MDFVPL - Mother Dairy Fruit & Vegetable Pvt. Ltd.
CFSP&TI - Central Frozen Semen Production and Training Institute	GoM - Government of Maharashtra	MPC – Milk Producer Company
CMT- California Mastitis Test	HACCP – Hazard Analysis Critical Control Point	MSP – Minimum Standard Protocol
CRP – Calf Rearing Programme	HGM – High Genetic Merit	MTC - Micro Training Centres
CST – Concentrated Solar Thermal	IBR - Infectious Bovine Rhinotracheitis	MTPD – Metric Tonne Per Day
DAHD – Department of Animal Husbandry and Dairying	ICAR – Indian Council of Agricultural Research	NADCP - National Animal Disease Control Programme
DCS – Dairy Cooperative Society	IDA – International Development Association	NCC – National Codex Committee
DIDF – Dairy Infrastructure Development Fund	i-DIS – Internet Based Dairy Information System	NCDFI - National Cooperative Dairy Federation of India Ltd
DPMCU - Data Processor based Milk Collection Units	IFCN – International Farm Comparison Network	NDP I – National Dairy Plan 1
DPR – Detailed Project Report	INAPH - Information Network for Animal Productivity and Health	NFN – NDDDB Foundation for Nutrition
EAP - Equity Action Plan		NPDD – National Programme for Dairy Development
		NRLM - National Rural Livelihoods Mission

NSC - National Steering Committee	SS – Semen Stations
OPU – Ovum Pick-up	SDGs - Sustainable Development Goals
PC- Producer Company	TLPD – Thousand Litres per Day
PIP – Project Implementation Plan	TMR – Total Mixed Ration
POI – Producer Owned Institution	ToT – Training of Trainers
PS – Pedigree Selection	VBMPS – Village Based Milk Procurement Systems
PT- Progeny Testing	VMDDP - Vidarbha Marathwada Dairy Development Project
RBP – Ration Balancing Programme	WAMUL – West Assam Milk Producers' Cooperative Union Limited
RGM – Rashtriya Gokul Mission	
RSFP&D - Regional Stations for Forage Production and Demonstration	
SCC - somatic cell counts	
SCM - Sub-clinical Mastitis	
SMP – Skimmed Milk Powder	
SNT – Serum Neutralisation Test	
SOPs – Standard Operating Procedures	
SPCC - Spill Prevention, Control and Countermeasure	

Acknowledgement

- District Cooperative Milk Producers Unions, Federations and participating State and Union Territory Governments, including the State Department of Animal Resources Development and Animal Husbandry, State Livestock Development Boards
- Government of India, especially the Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Ministry of Finance and the Niti Aayog



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