National Dairy
Development Board

Annual Report 2014-15

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(As on 31 March 2015)

Shri T Nanda Kumar
Chairman

Smt. Rajni Sekhri Sibal
Joint Secretary (Cattle & Dairy Development)
Department of Animal Husbandry, Dairying and Fisheries
Ministry of Agriculture
Government of India

Shri Jethabhai P Patel*
Chairman
Gujarat Cooperative Milk Marketing Federation Ltd.
Anand

Shri V Kehie*
Chairman
The Nagaland State Dairy Cooperative
Kohima

Shri Jog Singh Balot***
Chairman
Rajasthan Cooperative Dairy Federation Ltd.
Jaipur

Smt. Vaishali Balasaheb Nagawade****
Chairman
Maharashtra Rajya Sahakari Dudh Mahasangh Maryadit
Mumbai

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Secretary
Department of Agriculture Research and Education (DARE)
and Director General, Indian Council of Agricultural Research (ICAR)
New Delhi

Shri BM Vyas**
Ex Managing Director
Gujarat Cooperative Milk Marketing Federation
Anand

Shri Dilip Rath
Managing Director

Shri Sangram Chaudhary
Executive Director

* From 5 March 2015
** Till 4 March 2015
*** Till 9 June 2014
**** Till 24 July 2014

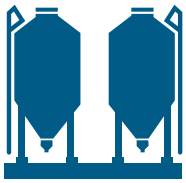
Shri Pranab Mukherjee, President of India presented the Indira Gandhi Rajbhasha Puraskar to Shri Sangram Chaudhary, Executive Director, NDDB

THE YEAR IN RETROSPECT

India continued to be the largest milk producing nation in 2014-15 with an anticipated milk production of 146.3 million tonnes. The country's share in world milk production stands at 18.5 per cent.

DOMESTIC DAIRY SCENE

With an anticipated milk production of 146.3 million tonnes, an increase of 6.2 per cent over the previous year, India continued to be the largest milk producing nation in the world. The per capita availability of milk increased to 322 grams per day which was more than the world average.



146.3

MILLION TONNES OF MILK PRODUCTION

PER CAPITA AVAILABILITY

322

GRAMS PER DAY

13.9

MILLION TONNES OF MILK COLLECTED BY DAIRY COOPERATIVES

The dairy cooperatives collectively procured 13.9 million tonnes of milk registering a growth of around 11.1 per cent as compared to last year. Liquid milk marketing of the cooperatives stood at 11.7 million tonnes with an increase of around 6.1 per cent over last year.

Imports of milk & milk products increased nominally while exports declined by 56 per cent. Export of milk powder declined from 1.38 lakh tonnes during 2013-14 to 0.36 lakh tonnes during the current year.

The average price of skimmed milk powder declined from ₹ 297 per kg in April 2014 to ₹ 213 per kg in March 2015 in the domestic market. The decline in both domestic and international prices led to significant increase in milk procurement by the cooperatives and increase in stocks of conserved commodities.

There is clearly some stress in the current state of affairs in the dairy industry in the country. Most of the dairy cooperatives however have continued to support the dairy farmers by ensuring that the price paid to the farmers is not reduced. This has resulted in excessive supply of milk to the dairy cooperatives resulting in accumulation of large quantity of Skimmed Milk Powder (SMP) with them. According to some reports, the private companies have pushed down prices to very low levels, thereby affecting farmers' income and the viability of small holder dairy farms. Further, many private dairy plants that are usually into powder and other value added products for better realisation, have either closed down their operations or scaled down their milk collection causing hardship to the dairy farmers.

THE INTERNATIONAL DAIRY SCENE

FAO reported 3.1 per cent increase in world milk production from 765 million tonnes in 2013 to 789 million tonnes in 2014 due to favourable weather conditions and feed prices. Milk production amongst major exporters – the European Union, New Zealand and the United States of America grew at a higher rate. China, the largest importer of milk powder, reduced purchases of dairy commodities after middle of 2014. In addition, Russia, the major dairy importing country, imposed full ban on import of milk and cheese since August 2014. These developments led to an imbalance in the world dairy trade.

International prices of dairy products continued to remain low throughout the year. Between April 2014 and March 2015, prices for Skimmed Milk Powder (SMP) declined by 30 per cent, Whole Milk Powder (WMP) by 23 per cent, butter by 5 per cent and cheese by 25 per cent. The producer prices of milk dropped by 25 to 50 per cent in major exporting countries and in certain countries touched their lowest level since 2007.

With a downturn in the dairy market, the cash flow turned negative and about 3 per cent of cows in major exporting countries are reported to have been discarded during the year. In some exporting countries, about two-third of agriculture loans are given to dairying and the price melt-down had a direct bearing on financing institutions and national economy.

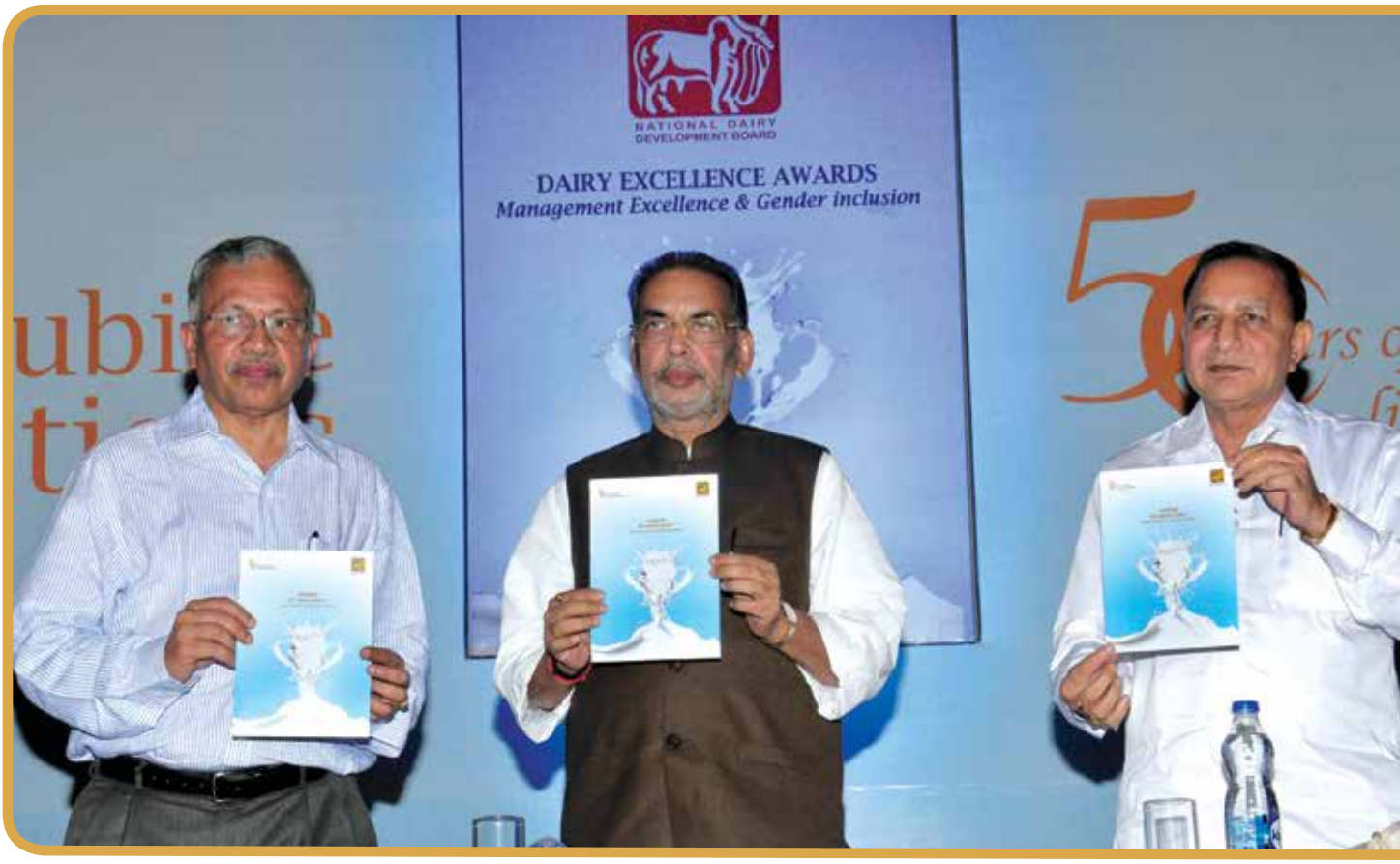
STRENGTHENING COOPERATIVE BUSINESS

NDDB adopted innovative strategies to reach out to the small and marginal milk producers and help improve their lives through increase in income from dairying.

Women milk producers continued to be a priority for activities undertaken during the year. In India, women are critical to milk production, as they are involved in almost all aspects of work related to animal management. Therefore, efforts were made to increase the number of women members in the village level Dairy Cooperative Societies (DCS). Women members of the DCS are also being encouraged to assume leadership roles. During 2014-15, the number of all women DCS increased to 27,317. As on March 2015, the total number of women members in dairy cooperatives across the country was 4.5 million.

A significant step taken in this direction was to encourage the cooperative milk unions receiving funding under the National Dairy Plan I, to employ Lady Extension Officers, who would create awareness about the benefits of dairying to the farmers at village level and motivate more women to join the dairy cooperatives. Training and salary support for the Lady Extension Officers is being provided to the milk unions.

Shri Radha Mohan Singh, Union Minister for Agriculture dedicating Parikrama to milk producers



Shri Radha Mohan Singh, Union Minister for Agriculture releasing the brochure for NDDB Dairy Excellence Awards

Financial inclusion of Milk Producers under Prime Minister Jan Dhan Yojna

Efforts have been made to promote financial inclusion of the members of cooperatives, especially women members by advising milk unions to encourage milk producers to open bank accounts for milk producers under the Prime Minister Jan Dhan Yojana. During the year, more than 1.4 million producer members have opened bank accounts either under the scheme or otherwise.

Training and capacity building was one of the major thrust areas, with various modules designed for farmers and milk union officers organised during the year. The content of the programmes include importance of dairying in the livelihood basket of farmers, cooperative principles, importance of women participation, fairness and transparency in milk collection system, scientific animal management practices, better quality fodder and clean milk production practices.

To promote democratic governance system in dairy cooperatives, orientation programmes for the Board of Directors of the various milk unions and training of the management committee members of the Dairy Cooperative Societies were conducted. During the year, a short film, to create awareness on the benefits of cooperatives was also produced for distribution to dairy farmers.

Throughout the year, efforts were made to reach out to the states where the dairy cooperatives have not been able to establish a strong presence and help them develop their cooperative structures by making dairying an attractive source of livelihood for their milk producers.

As on March 2015, the cooperative milk unions covered about 0.16 million village dairy cooperative societies, with a total membership of 15.4 million milk producers. The cooperative milk unions procured an average of 38 million kg of milk per day with a growth of about 11.1 per cent over last year. The sales of liquid milk reached 31.2 million litres per day, recording a growth of 6.1 per cent over the previous year.

NDDB continued its efforts to influence State Government policies to enable dairy cooperatives function as true business enterprises serving the cause of small and marginal dairy farmers.

With increasing uncertainty in rainfall and its adverse effect on crop production, dairying is increasingly becoming a major source of income. Dairy cooperatives in India are owned and controlled by the milk producers, which have provided them with the necessary support structure to carve out a viable livelihood source for themselves.

The dairy cooperatives procure as little as one litre of milk from the members and provide them an assured market for selling milk. As the price paid to producers for milk collected from them is based on its quality, which is measured

Clean Milk Production initiatives under Swachh Bharat Abhiyan

The objectives of "Swachh Bharat Abhiyan" launched by the Government of India are being supported by NDDB's "Clean Milk Production" (CMP) programme implemented under Village Based Milk Procurement System (VBMPS) of National Dairy Plan 1.

The programme aims at ensuring quality of milk to meet the consumer's expectations of pure, safe and hygienic milk and milk products. All those possible factors which have a direct or indirect bearing on quality of milk are being emphasised. Hygiene education and sanitation awareness is being used to orient dairy farmers for implementing CMP. Health of dairy farmer and cleanliness of surroundings is also being promoted in villages. Further, Co-operative milk Federations/Unions have been requested to initiate a campaign for "Swachh Gram, Swachh Doodh" to support the goals of "Swachh Bharat Abhiyan".

4.5 MILLION WOMEN MEMBERS IN DAIRY COOPERATIVES ACROSS THE COUNTRY AS ON MARCH 2015

at the collection point itself, milk producers are assured of a fair price. Various services provided by the dairy cooperatives like doorstep Artificial Insemination (AI) services, sale of cattle feed & mineral mixture and knowledge dissemination on better animal management practices, enable the milk producers to increase productivity which helps reduce costs and increase income from milk production.

Women in the forefront of cooperative dairying

Use of ropeway to transport milk from upper hills to dairy

MANAGEMENT OF DAIRY COOPERATIVES

JALGAON MILK UNION

NDDB continued to manage the Jalgaon Milk Union. During the year, the Union procured 1,96,777 kg of milk per day through 822 Dairy Cooperative Societies in its operational area and marketed about 1,75,000 litres of liquid milk per day. Besides milk, the Jalgaon Milk Union manufactured and marketed butter, *ghee, paneer, shrikhand, curd* and butter milk. The Union's Cattle Feed Plant produced 2,349 MT of cattle feed per month. The Jalgaon Milk Union has registered a turnover of about ₹ 3,060 million for the year.

Extension activities received due importance during the year. The Jalgaon Milk Union coordinated around 50,481 Artificial Inseminations (AIs) and about 1,665 animals were vaccinated and given de-wormer. More than 9,350 milk producers benefited from over 611 training programmes conducted by the Union. Eighty one Women's Dairy Cooperative Leadership Programmes (WDCLP) were conducted to benefit more than 2,805 women and 355 women thrift groups were organised.

WEST ASSAM COOPERATIVE MILK UNION LTD.

During the year, the Union reported an average milk procurement of 26,100 kg per day with a peak procurement of around 32,100 kg per day registering an increase of around 11.24 per cent over the previous year. As of March 2015, the Union has organised 150 functional milk producers' institutions/dairy cooperative societies in 10 milk collection routes with a total membership of around 4,000 milk producers. 'Purabi Milk Day' was organised to recognise and felicitate the contribution made by women milk producers.

Liquid milk sales, under the brand name 'Purabi', increased by 12 per cent over the past year. Growth was recorded in sale of *paneer*, sweet curd, plain curd, flavoured milk, *ghee* and *lassi*. The turnover of the Union grew by 21 per cent to ₹ 651.5 million.

During the year, the State Government has sanctioned an amount of ₹ 118.2 million under the World Bank assisted Assam Agricultural Competitiveness Project – Additional Financing (AACP-AF) against an annual work plan submitted by the Union to implement the Assam Dairy Development Plan (ADDP). In November 2014, the Union received an interim funding support of ₹ 11.5 million to initiate the doorstep AI delivery services project in the district of Nagaon.

The doorstep AI delivery services project has helped in replacing the age old technique of breeding, through bulls, used by the cattle owners in the district. The project is sourcing frozen semen straws from 'A' graded semen station - SAG, Bidaj in Gujarat.

Since the launch of the Assam Dairy Development Plan, around 120 Mobile Artificial Insemination Technicians (MAITs) in Nagaon district have been inducted and trained in Eastern Region Demonstration and Training Centre (ERDTC), Siliguri in West Bengal. As on March 2015, these trained MAITs have performed 4,500 AI services covering around 820 villages in Nagaon district. About 165 village awareness camps have been conducted which have enabled the milk producers to avail doorstep AI delivery services at a nominal fee of ₹ 50. Moreover, infertility camps conducted as part of the project have helped in disseminating information on proper feeding practices, timely deworming, disease diagnosis and vaccination schedule for animals.

JHARKHAND STATE COOPERATIVE MILK PRODUCERS' FEDERATION LTD. (JCMF)

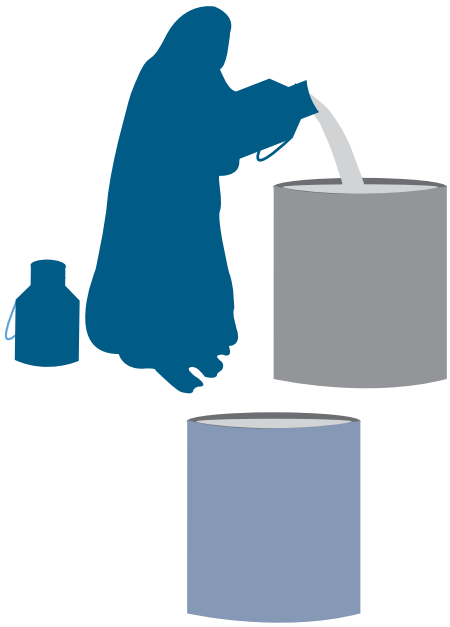
With a view to give impetus to dairy development in Jharkhand, the State Government formed the Jharkhand State Cooperative Milk Producers' Federation (JMF) in June 2013. Considering the role of NDDB in providing financial and technical support to producer-owned, professionally managed institutions for dairy development in the country, Government of Jharkhand, requested NDDB to assume the management of the newly formed Jharkhand Milk Federation. A Memorandum of Understanding was signed between NDDB and Government of Jharkhand on 1st March 2014 to manage the Federation initially for a period of five years.

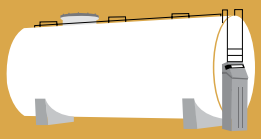
NDDB positioned its team at Jharkhand and submitted a plan for 2014-15 to Government of Jharkhand, which was approved. From 1st August 2014, Jharkhand Milk Federation assumed responsibility for the

milk procurement, processing and marketing activities through Ormanjhi, Koderma and Deoghar dairies. Milk procurement at these plants has increased from about 12,000 kg per day in August, 2014 to around 34,000 kg per day in March, 2015.

Further, NDDB has taken up the establishment of a milk processing plant of 50 TLPD capacity, expandable to 100 TLPD capacity, at Hotwar, on a turnkey basis. NDDB has also constructed and commissioned a 12 MTPD capacity mineral mixture plant at Hotwar.

A comprehensive plan for the next four years has been worked out, based on survey of milk production potential conducted by NDDB, which will be operationalised by the Jharkhand Milk Federation with a target to achieve a level of 1,60,000 litres of liquid milk marketing by the end of project period.





25.8 MILLION LITRES PER DAY CHILLING CAPACITY HAS BEEN INSTALLED IN RURAL AREAS

SUPPORT TO DAIRY COOPERATIVES AND ALLIED ORGANISATIONS

NDDB provided necessary guidance and technical assistance to dairy cooperatives and allied organisations for improving food safety and quality of milk and milk products and ensuring compliance with provisions of the prevailing food regulations in the country.

A two-day National Seminar on "Challenges before the Cooperative Dairy Sector" was organised at Anand with a view to help the industry understand, and effectively comply with, the requirements of prevailing Food Regulations in the country. The seminar also provided a platform for an effective interaction between the industry representatives and food regulatory officials.

Technical assistance was provided in setting up effective milk collection and handling systems in the rural areas for improving the quality of raw milk delivered to dairy processing units, upgrading milk processing units and developing cold chain in distribution. As a result of the sustained efforts by the NDDB, about 9,865 bulk milk coolers with a chilling capacity of 25.8 million litres of milk per day have been installed by the dairy cooperatives in rural areas thereby contributing significantly to the improvement in the quality of raw milk for further processing. Dairy cooperatives have set up approximately 1 lakh units of equipment for quick and transparent milk quality testing at the village level so that the milk producers are paid fair and remunerative prices for the milk supplied by them.

NDDB also assisted in skill up-gradation of milk producers and dairy personnel across the dairy value chain in hygienic and scientific methods of milk production, collection, handling and processing by imparting need based education and training.

Linking producers to an assured market

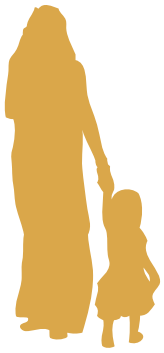
TECHNICAL SUPPORT TO GOVERNMENT OF INDIA

NDDB continued to provide technical support to the Government of India in matters related to Codex Alimentarius Commission and domestic food regulations. Besides providing technical inputs for developing India's position on Codex documents, NDDB officers also participated in the official Indian delegations to various Codex meetings and led the Indian delegation to the 8th Session of the Codex Committee on Contaminants in Foods. NDDB officers participated actively with significant contributions in the process of revision of milk and milk product standards undertaken by the Food Safety and Standards Authority of India.

STRENGTHENING VILLAGE BASED MILK PROCUREMENT SYSTEMS

Village Based Milk Procurement System (VBMPS), one of the three major components of the National Dairy Plan Phase I (NDP-I), progressed significantly during the year. The number of approved sub-project plans (SPPs) increased from 58 by end of March 2014 to 99 by March 2015, including 2 sub-project plans of producer companies, covering a total approved outlay of ₹ 6,191.29 million, with a grant component of ₹ 3,843.62 million and contribution of ₹ 2,347.67 million by the End Implementing Agencies (EIA).

The coverage under the Plan increased to 15 states during the year. By March 2015, 8,745 villages were covered for either formation of new



2.44

LAKH NEW MEMBERS WERE INDUCTED INTO THE SYSTEM OF WHICH 51 PER CENT ARE WOMEN

Dairy Cooperative Societies or strengthening of existing Dairy Cooperative Societies with facilities for milk chilling using Bulk Milk Coolers and testing facilities. While about 2.44 lakh new members were inducted into the system, another 3.4 lakh existing members benefited from the improvements in the milk collection system. Of the incremental membership achieved till now, more than 51 per cent are women. Incremental milk procurement for the villages covered has been more than 7,50,000 kg per day till March 2015.

Village Based Milk Procurement System (VBMPS) component of NDP-I has facilitated the dairy cooperatives in the country to reach out to the hitherto uncovered areas and increase coverage of cooperative dairying. Greater number of milk producers are benefiting from the increased access to organised market. A large number of women members have been covered under VBMPS, which has helped improve their confidence and economic self-reliance. The focus on extensive coverage of tribal dominated villages continued during the year. Installation of Automated Milk Collection Units (AMCUs) and Data Processor Based Milk Collection Units (DPMCUs) in the newly formed and existing Dairy Cooperative Societies has improved fairness and transparency. Introduction of Bulk Milk Coolers (BMCs) at strategic locations in the milk collection routes has improved the quality of milk collected, in terms of longer shelf life as indicated by the results of Methylene Blue Reduction Test (MBRT) recorded at the End Implementing Agency (EIA) level.

MILK PRODUCER COMPANIES

In addition to the existing two milk producer companies, Paayas in Rajasthan and Maahi in Gujarat, three more Milk Producer Companies (MPCs) - Shreeja in Andhra Pradesh, Baani in Punjab and Saahaj in Uttar Pradesh were incorporated during the year. Among these, Shreeja Mahila MPC is an 'All Women Member" MPC.

All the producer-member directors of Shreeja MPC are women and the other MPCs have at least two women members on the Board. During the year, Producer Directors of Shreeja and Baani Milk Producer Companies underwent a 'Business Orientation Programme' which was facilitated by NDDB Dairy Services. The Board of Directors of Paayas and Maahi undertook an exposure visit during the year.

Under the National Dairy Plan I, Paayas and Maahi have taken up various awareness building programmes for the producers, women, rural youth, rural school children and for Member Relations Groups (MRGs). Refresher training/orientation programmes were also conducted for managers/facilitators of the companies and the Sahayaks operating the milk pooling points.

Productivity enhancement activities such as providing Artificial Insemination (AI) services, advisory services for Ration Balancing and Fodder Development and Delivery of Cattle Feed and Mineral Mixture, were undertaken in Paayas and Maahi under the National Dairy Plan I. In these two producer companies, about 1.6 lakh AIs were performed in 4,802 villages by 685 Mobile AI Technicians (MAITs). Likewise, about 2 lakh animals were covered under Ration Balancing Programme (RBP) in 3,387 villages through 1,768 Local Resource Persons (LRPs) which resulted in about 11 per cent reduction in feed cost per kg of milk. Productivity enhancement activities were also

Transparency in operations and milk chilling facility under NDP-I has brought smiles on the faces of milk producers

initiated in the three new producer companies and cattle feed and area specific mineral mixture were launched under brand name 'India Feed' and 'India Min' under an arrangement with NDDB's wholly owned subsidiary – NDDB Dairy Services (NDS).

Together, these five milk producer companies enrolled about 2.67 lakh milk producers as members till 31st March 2015. Of the total membership, about 36 per cent were women and 52 per cent were small and marginal milk producers. The five producer companies collectively procured about 18 lakh kg of milk per day during the year and about ₹ 473 million had been collected as share capital. They are expected to pay a dividend of about 10 per cent on an annualised basis to the producer members for the year 2014-15.

The three new producer companies were mainly involved in bulk sales of raw milk, but would soon be launching their retail sales of liquid milk. Paayas and Maahi continue to market milk & milk products under their own brand and the total liquid milk sales was around 3,45,000 litres per day. During the year, Maahi also forayed into marketing sweets- *Rasgulla, Gulabjamun, Soanpapdi* and *Kajukatri*.

ENHANCING PRODUCTIVITY

Raising milk production solely through increasing the animal numbers would not be advisable in the long term, because of increasing constraints on feed and fodder availability. It is therefore imperative, that the country focuses on increasing the productivity of cattle and buffaloes to meet the growing demand of milk.

Raising productivity of cattle and buffaloes involves not only building an infrastructure and taking up programmes for genetic improvement of animals but also investing in creating the right environment to exploit the full genetic potential of animals through provision of balanced nutrition and protection of animals against diseases. Evolving right institutional structure and building knowledge and capacity of people is equally important to implement the programmes on a long term basis. Constant innovations in current processes and technologies are required to accelerate the growth in productivity of cattle and buffaloes.

A majestic Sahiwal bull

ANIMAL BREEDING

Achieving a steady genetic improvement in any population requires building an infrastructure for not only genetic evaluation and production of high quality bulls but also for dissemination of their genetics in the target population to produce genetically superior replacement heifers in the field.

The National Dairy Plan I is one of the key development initiatives taken up by the Government of India (GoI) to build infrastructure and put scientific programmes in place to increase the productivity of cattle and buffaloes by involving several organisations in the country.

Under NDP-I, Progeny Testing (PT) and Pedigree Selection (PS) programmes have been initiated to evaluate and produce High Genetic Merit (HGM) bulls and 22 select semen stations have been strengthened to produce the required high quality, disease free semen doses. A pilot Artificial Insemination (AI) delivery infrastructure has also been built to demonstrate how AI delivery services could be provided most efficiently on a sustainable basis. These efforts have been bringing in a paradigm shift in the production and selection of dairy animals in the country.

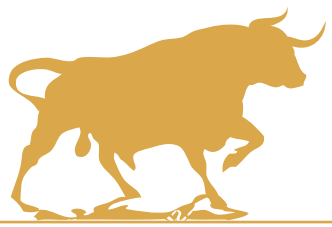
PROGENY TESTING

Thirteen Progeny Testing programmes for five breeds – *Murrah* and *Mehsana* breeds of buffalo and Holstein Friesian (HF), Crossbred HF and Crossbred Jersey breeds of cattle – have been implemented in different states. The progress made under these programmes is summarised in the table below:

All PT projects have been implemented following the Standard Operating Procedures (SOP) and the Minimum Standards (MS) laid down by Department of Animal Husbandry, Dairying and Fisheries (DADF), GoI. During the year, milk component testing of milk samples collected at the time of monthly milk recordings was initiated in 11 PT projects. Work on standardisation of measurement procedures for type traits in different breeds was initiated. All the projects together, since the launch of the projects in 2012-13, have put 476 bulls under test and made available 212 young High Genetic Merit bulls to different semen stations for the production of semen doses.

Progress made under PT projects:

Breed	End Implementing Agency/State	No. of Bulls put to test	No. of HGM Bulls made available for distribution
Murrah	SAG, Bidaj (Gujarat), PLDB, Chandigarh (Punjab), HLDB, Panchkula (Haryana), ABRO, Salon (Uttar Pradesh)	179	27
Mehsana	Mehsana Milk Union, Mehsana (Gujarat) & Banas Milk Union, Palanpur (Gujarat)	46	40
HF	KMF, Bengaluru (Karnataka)	55	41
Crossbred HF	SAG, Bidaj (Gujarat), ULDB (Uttarakhand)	101	98
Crossbred Jersey	APLDA, Hyderabad (Andhra Pradesh), TCMPF, Chennai (Tamil Nadu)	95	6
Total		**476**	**212**



ALL THE PROJECTS TOGETHER HAVE PUT 476 BULLS UNDER TEST AND SUPPLIED 212 YOUNG HIGH GENETIC MERIT BULLS TO DIFFERENT SEMEN STATIONS FOR THE PRODUCTION OF SEMEN DOSES

Milk recording of a Murrah buffalo

PEDIGREE SELECTION

Considering the importance of conserving and developing some of the indigenous dairy and dual purpose breeds of cattle and buffalo, pedigree selection programmes for nine breeds – *Kankrej, Rathi, Gir, Sahiwal, Hariana* and *Tharparkar* breeds of cattle and *Nili Ravi, Jaffarabadi* and *Pandharpuri* breeds of buffalo – in their native tracts have been started under NDP-I.

These PS projects aim at producing bulls by identifying the best female animals available with farmers and breeding them with best bulls. They also address the major concern of promoting AI in indigenous breeds of cattle and buffalo, as the AI coverage in these breeds is very low. The projects follow SOP and MS laid down by DADF, GoI. During the year, PS projects together made available 31 HGM bulls. Three hundred twentyone AI centres have been established. During 2014-15, these AI centres together carried out 45,791 AIs.

Progress made under PS projects:

Sl No	Indigenous Breed	End Implementing Agency & States	No. of AI centres established	No. of bulls made available for Distribution
1	*Gir*	SAG, Gujarat	52	0
2	*Kankrej*	Banas Milk Union, Gujarat	54	22
3	*Rathi*	URMUL Trust, Rajasthan	47	9
4	*Nili Ravi*	PLDB, Punjab	49	0
5	*Jaffarabadi*	SAG, Gujarat	49	0
6	*Pandharpuri*	MLDB, Maharashtra	30	0
7	*Hariana*	HLDB, Haryana	40	0
Total			**321**	**31**

Ear tagging of a buffalo calf

NDDB GENERATED AND DELIVERED 52.57 LAKH UNIQUE IDENTIFICATION NUMBERS FOR 73 INSTITUTIONS IN 17 STATES

IMPORT OF BULLS AND EMBRYOS

During the year, NDDB imported 76 purebred Holstein Friesian (HF) Bulls from Germany. Forty of them were quarantined at the Animal Quarantine and Certification Services (AQCS), Chennai and the balance 36 were at AQCS, Kolkata for 30 days. After completing the mandatory quarantine period, they were distributed to 14 semen stations being strengthened under NDP-I in 13 states to produce semen doses.

These semen doses will primarily be used for breeding crossbred/ non-descript cows confirming to the breeding policies of the concerned states.

In addition to import of purebred HF bulls, an order was placed for the import of 480 embryos of purebred HF and Jersey breeds. Imported embryos are planned to be used by four Participating Agencies (PAs) - BAIF Development Research Foundation, Sabarmati Ashram Gaushala (SAG), Paschim Banga Go Sampad Bikash Sanstha (PBGSBS) and Uttarakhand Livestock Development Board (ULDB) which have the required experience, expertise and infrastructure for embryo transfer activities. Four sub-project proposals were approved for implementation of the project titled: "Bull Production through Transfer of Imported Embryos (BPTIE)".

DAIRY'S DIGITAL CONNECT

The Information Network for Animal Productivity and Health (INAPH) application is being used for implementation of PT, PS, AI Delivery projects implemented under the NDP-I. The use of INAPH increased significantly during 2014-15 covering 85 projects, spread across 158 districts in 15 states. About 3.8 million animals belonging to 1.8 million farmers spread over 19,284 villages have been registered in the system. During the year, NDDB facilitated 72 INAPH Training of Trainers' (ToT) programmes and transferred knowledge to 1,699 trainers, enabling them to train field users across the country. An SMS delivery mechanism of INAPH system started functioning to broadcast animal management related SMS directly to farmers, field force and project managers. Having realised its effectiveness and efficiency in monitoring the performance of livestock in many projects, the Department of Animal Husbandry, Dairying and Fisheries, Government of India has recommended its use in implementing another central sector scheme - National Programme for Bovine Breeding and Dairy Development (NPBBDD). Several State Implementing Agencies (SIAs), State Livestock Development Boards/Agencies, State Government Departments and NGOs have expressed their desire to implement INAPH for monitoring AI activities and performance monitoring of animals in their projects and farms.

Gujarat and Rajasthan have already joined the network, whereas Assam, Bihar, Chhattisgarh, Goa, Himachal Pradesh, Karnataka, Maharashtra, Odisha, Punjab and Tamil Nadu have expressed their interest to use INAPH.

As entrusted by DADF, GoI, NDDB is centrally managing allocation of unique numbers for animal identification in the country. During the year, NDDB generated and delivered 52.57 lakh unique identification numbers for 73 institutions in 17 states.

INNOVATION AND ADOPTION OF TECHNOLOGIES TO ENHANCE PRODUCTIVITY

FROZEN SEMEN PRODUCTION

Production of frozen semen doses continued to register an impressive growth in terms of both quality and quantity during the year. Fifty semen stations owned by Governments, Cooperatives, NGOs and private companies together produced around 95 million frozen semen doses during 2014-15.

Under NDP-I, three more semen stations were added to the list of semen station strengthening projects during the year taking the total number to 22. The semen station strengthening projects have triggered the development of infrastructure, especially for biosecurity and for production and processing of high genetic, disease free semen doses complying with Minimum Standards (MS) as laid down by the Government of India. During 2014-15, these 22 semen stations together produced 68.04 million semen doses.

AI delivery services to farmers remained the core of input services rendered by all cooperative milk unions. During 2014-15, the cooperative milk unions together performed around 14.5 million AIs through 19,600 centres covering some 56,800 villages.

BOVINE GENETICS ON WHEELS

NDDB deployed a mobile van fabricated with clean air technology and equipped with modern equipment for semen and embryo collection, processing and freezing. The facility was used to collect and process semen from HGM bulls of *Gir* breed at Kundal village of Bhavnagar district and Rajmoti Gaushala, Kodinar in Junagadh district. Around 1,600 semen doses were successfully processed and frozen from these bulls.

Besides collecting semen from bulls, the mobile lab is planned to be used for collection of embryos from elite donors of indigenous breeds of cattle and buffaloes in the field.

GENOMIC SELECTION

Genomic selection is being used in dairy cattle breeding across the world. To initiate genomic selection procedures in India, NDDB has started collecting DNA samples from performance recorded animals. These DNA samples would be used for identifying Single Nucleotide Polymorphisms (SNPs) useful for genomic selection of the indigenous and crossbred cattle.

Mobile lab for customised freezing of semen and embryos at farmers' doorstep

TRAINING AND CAPACITY BUILDING

Training and capacity building is an integral part of implementing various projects under NDP-I. During the year, 28 officers of PT & PS projects were trained at NDDB, Anand. NDDB also facilitated training of 91 officers and 49 laboratory technicians at four training Institutions – NDRI, Karnal; KLDB, Mattupatty; MVC, Chennai and AAU, Anand under Semen Station Strengthening Projects.

Under the NDP-I, training of officers in Genetic Improvement programme has been envisaged in a dairy advanced country. Accordingly, the first batch for 15 officers from various PT and PS sub projects for HGM bull production were trained at Wageningen University and Livestock Research Centre, The Netherlands during 12-23 May 2014.

TECHNICAL WORKSHOPS

During the year, two workshops were organised - one on: "Production and Processing of Bovine Semen" (16-18 October 2014) and another on: "Revisiting Minimum Standards (MS) for production of bovine frozen semen" (12-14 March, 2015) for the benefit of officers involved in semen production. The workshops were facilitated by internationally reputed scientists and professionals working in the field of bovine semen production. The workshops opened new vistas in the production and processing of frozen semen. They also provided opportunities to examine and revise the MS and SOPs on the basis of current scientific trends and innovations. Such revisions will add value to the existing protocols and practices to improve the quality of semen produced in the country.

FOREIGN EXPERTS

Dr. Gabriel Couto, Canada

NDDB engaged a Canadian Embryo Transfer (ET) consultant, Dr. Gabriel Couto, to facilitate Bull Production through Imported Embryos. He visited ET facilities of four Participating Agencies (PAs). He assessed ET infrastructure available with PAs and skill level of ET practitioners. He also demonstrated live ET in recipients on these farms. He also facilitated a workshop to prepare a road map for production of exotic bulls using imported embryos under NDP-I. ET officers of all PAs and concerned officers of NDDB participated in the workshop.

Dr. Mona Schwerhoff and Mr. Steffen Hambruch, Germany

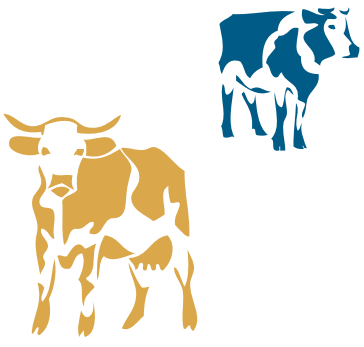
Dr. Mona Schwerhoff, a German expert on Management of Farm Animals, visited India and made a presentation on management of imported HF bulls at Madras Veterinary College in Chennai on 15th February 2015. Around 15 officers from various semen stations, DADF and NDDB attended the presentation. Similar presentation was given by Mr. Steffen Hambruch at Kolkata.

PROJECT MONITORING AND EVALUATION

NDDB officers monitored 45 PS, PT and Semen Station Strengthening projects and provided administrative, technical and managerial support for smooth implementation of the projects by the End Implementing Agencies. Regular visits to the project sites by NDDB Monitoring Officers facilitated the implementation of various activities envisaged under respective projects and helped EIAs to achieve their project targets.

ANNUAL EVALUATION OF ANIMAL BREEDING PROJECTS

All Animal Breeding projects that completed one year of operation were evaluated by Evaluation Teams constituted by Mission Director, NDP-I. A total of 11 PT, 5 PS and 17 Semen Station Strengthening projects were evaluated. The evaluation helped in understanding the progress made by the projects and the constraints faced during implementation. The teams also suggested corrective measures for further improving qualitative and quantitative performance in these projects.



A lady LRP giving ration balancing advice to a milk producer

ANIMAL NUTRITION

Efforts for improving productivity of dairy animals through, Ration Balancing Advisory services at farmers' doorstep, using locally available feed resources and area specific mineral mixtures continued during the year. Limited available feed resources are required to be used judiciously. Efforts for use of certified/truthfully labelled fodder seed for increasing green fodder yield and for securing surplus biomass from the farmers' field for use during the lean period continued.

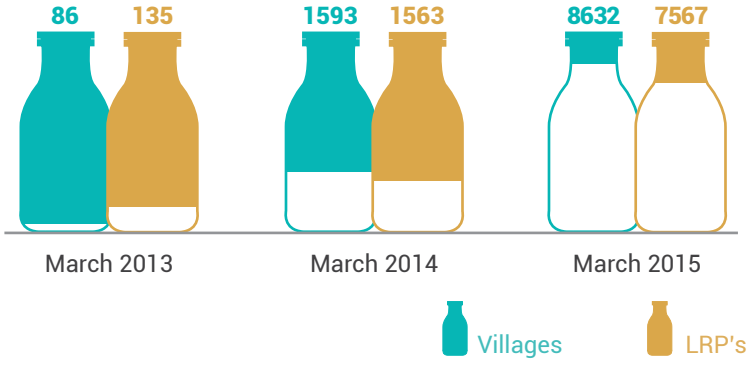
RATION BALANCING ADVISORY SERVICES

Under National Dairy Plan-I (NDP-I), Ration Balancing Advisory services at farmers' doorstep expanded during 2014-15. During the year, 33 Ration Balancing Programme-Sub Project Plans (RBP-SPPs) with a total outlay of ₹ 669.35 million were approved. In total, 67 SPPs in 63 milk unions and two producer companies with a financial outlay of ₹ 1,870.53 million and envisaged coverage of 1.64 million animals in 20,439 villages, spread over 14 states, were sanctioned.

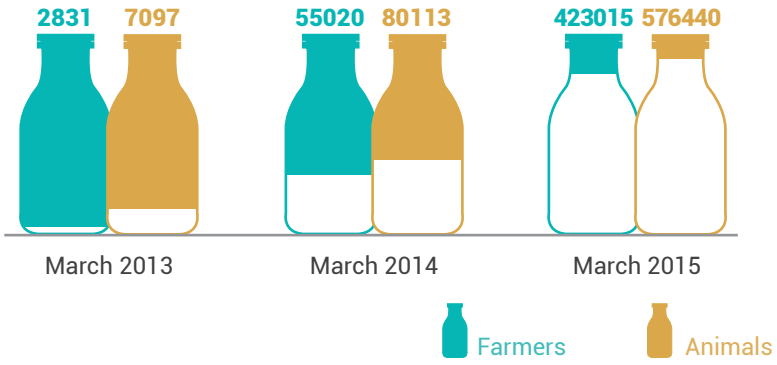
Availability of qualified and trained manpower is a pre-requisite for successful implementation of the programme. Training on RBP was organised during the year for 133 technical officers (TO), trainers and animal nutritionists from 40 EIAs. So far, 300 officers, including 25 women have been trained. Officers from the Animal Husbandry Department, State Agricultural University, Tamil Nadu and Karnataka were also trained on RBP, with an objective of expanding the reach of the programme beyond NDP-I areas. Training on INAPH (Information Network for Animal Productivity and Health) was also arranged for 20 information technology (IT) persons to equip them with the software functionalities and troubleshooting aspects.

Trained technical officers and trainers carried on the process of identifying and imparting software and practical RBP training to local resource persons (LRPs) at their respective EIAs. During the year, 5,640 LRPs were trained in 39 EIAs. Out of total 8,195 LRPs trained so far, 17 per cent are women, 12 per cent SC/STs and 57 per cent are small holders.

In 2014-15, the number of milk unions providing Ration Balancing Advisory services increased from 18 to 39. Remaining 28 EIAs are in various stages of procuring RBP accessories to initiate project implementation. A total of 6,004 LRPs provided advisory service on balanced ration for 3.7 lakh milk producers in 7,156 villages covering about 5 lakh animals. Cumulatively, 7,567 LRPs offered advisory services on balanced ration recommendations for 4.23 lakh milk producers covering 5.76 lakh animals in 8,632 villages.



Number of villages and LRPS under RBP



Number of farmers and animals covered by RBP

Online INAPH data indicates that balanced ration led to an increase in average daily milk yield of 0.17 kg and milk fat by 0.12 per cent. The cost of feeding was reduced by ₹ 2.09 per kg of milk. The average net daily income of milk producers increased by about ₹ 24 per animal.

For generation of wider awareness, RBP documentary was dubbed in nine regional languages with inclusion of region specific farmers' interviews. A short film on RBP was prepared and uploaded on YouTube. NDDB facilitated the development of a documentary for Doordarshan (DD National TV) channel. To enhance training effectiveness at EIA level, a documentary on LRP training was also developed.

As part of activities to promote RBP , NDDB put up a stall in International India Trade Fair (IIFT 2014) at Pragati Maidan, New Delhi, where LRPs made live demonstration of RB software to farmers and visitors from across the country. A digital scroller on RBP in Gujarati language was developed and installed at Banaskantha Milk Union.

Keeping in view the prevailing feeding practices for dairy animals in India and need to involve different stakeholders to extend the reach of Ration Balancing Advisory services to a large number of milk producers across various states, a workshop on productivity enhancement initiatives to meet future demand of milk and milk products was organised at NDDB, Anand.

MINERAL MAPPING PROGRAMME AND PRODUCTION OF AREA SPECIFIC MINERAL MIXTURE

Supplementation of area specific mineral mixture in the ration plays a pivotal role in improving productivity and productive life of dairy animals. Mineral mapping was completed for the state of Jharkhand. Calcium, phosphorus, magnesium, sulphur, copper, zinc, iodine, chromium and cobalt were found to be deficient in the ration of animals. Based on these results, an area specific mineral mixture formulation was developed for the state and is being produced at a mineral mixture plant of 12 MT per day capacity set up at Ranchi. So far, NDDB has assisted in setting up 31 mineral mixture plants under dairy cooperatives for production of area specific mineral mixtures. It has been observed that in regions where area specific mineral mixture is fed regularly, there has been a marked improvement in the reproduction efficiency, as indicated by reduction in number of artificial insemination per conception.

GREEN FODDER PRODUCTION ENHANCEMENT

Awareness and adoption of improved fodder production and conservation technologies among farmers is crucial in enhancing production and availability of green fodder significantly in terms of quality and quantity. About 5,000 farmers and officers from milk unions/End Implementing Agencies (EIAs) were oriented at Fodder Demonstration Unit (FDU) on high yielding improved varieties/hybrids of annual (sorghum, maize, pearl millet, berseem, lucerne, cowpea, rice bean), perennial fodder crops (*hybrid napier, guinea grass, cong-signal grass*), perennial pasture legume (*siratro, clitoria, stylo*) and fodder trees (*moringa, sheveri, gliricidia, augusthi*). Trainees were also shown demonstrations on conserving surplus green fodder through silage making and inter-cultivation of short duration fodder crops (sunflower, cowpea, Chinese cabbage) in long duration food/cash crop to maximise land productivity. To propagate the improved fodder technologies, visiting farmers and technical officers were also supplied about 18,000 root slips/stem cuttings of improved varieties of hybrid napier grass, guinea grass and other perennial grasses for fodder

Harvesting green fodder at appropriate stage for maximum nutrients output

Field demonstration of auto straw pick up balers

cultivation. Green fodder yield potential of newly developed improved varieties of sorghum (HJ 541, CSH 22 SS, CSV 24 SS, CSV 27 and CSH 24 MF) and Oats (J.O. 3-91, J.O. 1, H.J. 8 and JHO 2004) were also explained to visiting farmers.

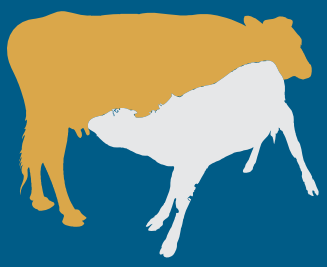
For arid/semi-arid area, cultivation of thorn-less cactus (*Opuntia spp.*) for fodder purpose is being popularised. For producing high quality fodder in alley cropping system, cultivation of drum stick (*Moringa oleifera*) along with forage crops is being demonstrated. Demonstration for growing thorn-less cactus and highly nutritious food cum fodder tree drum stick on raised bed and by using modern water saving (drip irrigation) and fertigation system with plastic mulching was initiated. To increase the availability of planting material of thorn-less cactus for planting in arid/semi- arid areas, NDDB initiated a collaborative project with Anand Agricultural University, Anand on standardisation of micro-propagation technology (tissue culture) in fodder cactus (*Opuntia*).

The use of quality seeds of improved high yielding varieties of fodder crops is critical in enhancing green fodder yield. NDDB is encouraging dairy cooperatives to establish fodder seed production, processing and marketing units. NDDB also assisted dairy cooperatives in the procurement of breeder seeds from different ICAR institutes/agricultural universities. During the year, 9.78 MT of breeder seed of improved varieties of fodder crops were obtained from the Indian Council of Agricultural Research/Agricultural Universities and supplied to dairy cooperatives. In turn, dairy cooperatives put the breeder seeds of maize, sorghum, berseem, lucerne, oats, cowpea, pearl millet and cluster bean in the seed multiplication chain. Dairy cooperatives organised production and marketing of 4,815 MT certified/truthfully labelled fodder seeds of high yielding improved varieties of fodder crops.

Under NDP-I, 22 new sub-project plans (SPP) were approved on Fodder Development Programme with total outlay of ₹ 341.97 million, including the establishment of 20 Micro Training Centres (MTC). For high quality fodder seeds, three new seed processing plants were commissioned at Bellary, Kolar and Vijayawada. The plants employ most modern specific gravity based sorting technique for guaranteed higher fodder yields. Civil and mechanical work is in progress for two seed processing plants at Lucknow and Kota. Establishment of new fodder seed plant was sanctioned at PCDF, Aligarh, (UP). Ten MTCs were established and made functional at different locations. EIAs supplied about 3,600 MT of certified/truthfully labelled fodder seeds to farmers. Four hundred forty seven silage demonstrations were organised in the villages. One hundred eight officers were trained on fodder production & conservation and 19 officers were trained on advanced seed production technology of 40 EIAs.

CROP RESIDUE MANAGEMENT

Even though crop residues form basal diet for livestock in India, a significant amount is wasted due to enhanced use of grain pickers traditionally known as combine harvesters. With an aim of reducing the straw wastage, appropriate mower ranges were introduced in various milk-sheds under dairy cooperatives. Combine prevention type reaper binders/liners in the capacity of 1-2 acre per hour in fodder deficit states like Gujarat, Maharashtra and Rajasthan, and straw recovery pick up type mower range in states like Andhra Pradesh, Karnataka and Punjab most intensive users of combine harvesters were introduced. During the year, 22 sub-project plans for carrying out demonstration of appropriate mowers and pick up devices in various milk unions spread across India were approved. In all, 121 sets of mowers and pick up devices were introduced. Apart from saving straw, the multi-purpose mowers inducted were found to be useful in silage making as well as sun drying of crop for longer storage. Considering the benefits like quicker field clearance for the next crop and labour free crop and roughage management, acceptance of these machines in Indian farming system is quite high. To create awareness on dry fodder storage, construction of biomass bunkers, each of 50 MT capacity, was organised at 20 locations.



ANIMAL HEALTH

Animal health plays an important role in harnessing the full productivity potential of an animal. NDDB has been constantly endeavouring to tackle issues on disease control by supporting pilot projects that embrace a holistic perspective. Enhancing animal health and biosecurity in bull production areas, and, in and around semen stations is also another area where continuous efforts are being made. NDDB remains committed to, and facilitates the process of dialogue among stakeholders in formulation of robust disease control strategies that would benefit the dairy farmers.

Point-of-care test takes disease diagnosis to the farmer's doorstep

AROUND 6,200 CATTLE AND BUFFALOES CALVES HAVE BEEN VACCINATED AND UNIQUELY IDENTIFIED BY EAR TAGS

NDDB continues to support the pilot project on brucellosis control and as on March 2015, around 6,200 cattle and buffalo calves have been vaccinated and uniquely identified by ear tags since the commencement of the programme in April 2013. All data related to each vaccinated animal is being captured in the Information Network for Animal Productivity and Health (INAPH). Awareness creation on the disease among all stakeholders and the control measures to be adopted by the farmers has a pivotal role to play in the programme.

The programme is for a period of five years with a total outlay of ₹ 16.90 million with NDDB contributing ₹ 10.49 million.

A pilot project on mastitis control was initiated in Sabarkantha Milk Union from October 2014 covering 50 milk societies and 25 progressive farms spread across the district.

The pilot is for a period of 24 months with an outlay of ₹ 10.5 million with NDDB's contribution at ₹ 6.3 million and the rest (₹ 4.2 million) being the Union's contribution. Awareness creation on subclinical mastitis, its timely detection and treatment along with propagating hygienic milking practices are the cornerstones of the project.

BIOSECURITY IN BULL PRODUCTION AREAS AND SEMEN STATIONS

With focus on biosecurity, especially in the context of NDP–I, the bull production areas, semen stations and its 10 km ring vaccination zones have been equipped with adequate technical competencies through training of its Animal Health Officers (AHO) in order to facilitate the implementation of activities under Animal Health & Biosecurity. A total of 36 AHOs from 13 Progeny Testing (PT), 7 Pedigree Selection (PS) projects and 16 semen stations have been trained at NDDB for this purpose. Animal Health & Biosecurity assessment has also been carried out for 1 PT, 2 PS, 4 Embryo Transfer (ET) and 3 SS projects to be included under NDP-I during the year.

Recognising the requirement for a mechanism to assess and upgrade the biosecurity processes in place at semen stations, NDDB was pivotal in facilitating the formulation of Standards, Guidelines and a scoring system exclusively for biosecurity which is under consideration by DADF.

SEMINARS AND WORKSHOPS ON DISEASE CONTROL

A workshop was held at NDDB, Anand inviting representatives from semen stations, progeny testing programmes, ICAR, DADF and, an expert each from one veterinary college and a diagnostic laboratory to bring about more clarity on the issue of Infectious Bovine Rhinotracheitis (IBR) & Bovine Viral Diarrhoea (BVD). The workshop aimed at preparing a workable strategy that will help the bull production programmes under NDP-I to procure disease free bull calves from the field and meet their targets. The recommendations of the workshop have been forwarded to the DADF for further action.

Working towards a holistic approach on brucellosis control, a seminar to create awareness on the zoonotic significance of brucellosis, especially among the doctors operating in the project area of the brucella control project was conducted. All the stakeholders, namely doctors, veterinarians, paravets and policy makers emphasised the need to work together to control brucellosis, both in humans and animals.

AWARENESS CREATION

In order to increase the awareness levels of dairy farmers on the need and benefits of vaccination and deworming, two short video clips in Hindi prepared by NDDB have been posted in public domain for free use.

A manual covering the major aspects of dairy husbandry has also been prepared by NDDB and is available in the public domain to help farmers manage their animals better. An abridged version of the manual is also available for free download for android phones.

RESEARCH & DEVELOPMENT

Application of improved methods and standards of disease diagnosis positively impacts milk productivity since animal health is important while selecting animals for breeding programmes aimed at enhancing milk productivity.

Following the recommendations of Minimum Standard Protocol (MSP) of DADF, GoI, efforts were made to hasten the diagnostic turnaround time, increase diagnostic capability to identify more number of abortion causing pathogens, monitor post-vaccine response, microbial quality testing services of frozen semen and employ improved field sampling techniques to various stakeholders. Another major activity of this unit was directed towards preparation of necessary documentation for obtaining accreditation of the R&D laboratory.

Real-time PCR set-up and data analysis for screening frozen semen against IBR virus.

Fluorescent microscopy for animal disease diagnosis

ANIMAL DISEASE DIAGNOSIS

Infectious Bovine Rhinotracheitis (IBR) caused by Bovine Herpesvirus 1 (BHV-1) and Bovine Brucellosis (BB) mostly caused by *Brucella abortus*, are the two major pathogens associated with abortion in cattle in India. IBR and BB are commonly identified by serology. Serum samples from field under Progeny Testing (PT)/Progeny Selection (PS) programmes and semen stations were received throughout the year. The number of samples received for IBR and BB were 12,974 and 11,934 respectively, of which 25.9 per cent were positive for IBR and 4.38 per cent positive for BB. The results were communicated to the respective stakeholders within 5-6 days of the receipt of samples with appropriate recommendations.

Bovine Viral Diarrhoea Virus (BVDV) is a pathogen that has to be screened under the new recommendations of the MSP. Serological screening of 3,088 serum samples indicated that only 0.13 per cent were positive for BVDV antigen. BVDV type 1 was isolated by blood culture from two persistently infected calves. Johne's disease caused by *Mycobacterium avium supspecies paratuberculosis* (MAP) results in a chronic debilitating condition that affects productivity. One of the accepted methods of assessing MAP in herds is by serology using ELISA. When 68 field samples were tested by ELISA, 10.29 per cent samples turned positive.

The R&D laboratory enhanced the capacity building exercise with respect to screening of bulls in semen stations against two more pathogens that causes abortion - Bovine Genital Campylobacteriosis (BGC) and Bovine Trichomoniasis. Bulls in semen stations should be free from BGC and Bovine Trichomoniasis as per MSP guidelines. The protocol for collection of prepucial washing from bulls, transportation techniques from field to the laboratory and identification by culture and molecular methods were standardised for screening BGC and Bovine Trichomoniasis. Twenty prepucial wash samples from bulls were negative for BGC by culture. Similarly, 49 prepucial wash samples were negative by culture for trichomoniasis. The turnaround time for identification of the two pathogens is 7 days.

THE R&D LABORATORY HAS INITIATED A PROGRAMME FOR CREATING POSITIVE AND NEGATIVE SERUM PANELS FOR BRUCELLOSIS, IBR, BVD, TUBERCULOSIS AND FMD

The quality control of Frozen Semen Batches (FSB) produced in semen stations is an important check point in disease prevention. Since sero-prevalence of IBR in semen station is high, screening of frozen semen batches for IBR using a validated real-time PCR was undertaken. A total of 16,792 FSB were screened against BHV-1 by real-time PCR from which 2.69 per cent were recorded positive. The results were communicated with appropriate recommendation to the stakeholders between 12-15 days turnaround time. Equally important is the assessment of total bacterial load of FBS. The R&D laboratory received a total of 194 FBS from two semen stations, and found 91.2 per cent of the FBS screened passed the quality control parameters.

In order to assess the efficacy of vaccination programmes being implemented by the NDDB/ stakeholders, serum samples were received for evaluation of antibody response following immunisation of cattle and buffaloes with Foot and Mouth Disease Virus (FMDV) and Brucella vaccines. Antibody response against FMDV sero-types 'O', 'A', 'Asia-1' was monitored in 5,532 serum samples. The results and recommendations were communicated to the stakeholders by three weeks.

Under the field vaccination programme against bovine brucellosis, post vaccine antibody response was assessed in 1,076 animals. A controlled study was conducted in an organised farm to study the response of calf-hood and adult vaccination against BB using the reduced dose of live *B. abortus* S19 vaccine. The antibody response in calves was detectable till 180 days post-vaccination, suggesting that standard serological assessment after this period will not pose any problem in interpretation of brucellosis status in the vaccinated animals. In adult cattle, 93 per cent of the 136 vaccinated adults showed sero-conversion by 60 days post vaccination in a brucella infected herd. The preliminary results showed that adults efficiently sero-converted which may be significant for controlling brucellosis.

Employment of validated diagnostic assays enhances the diagnostic precision, accuracy and bolsters confidence in the test. The laboratory had standardised and validated a real-time RT-PCR for identification of BVDV. The in-house real-time PCR compared well with commercial PCR kit.

The intradermal tuberculin test using bovine tuberculin PPD is the recognised standard screening tool for screening of bovine tuberculosis. However, recently, the Office International des Epizooties (OIE) has approved whole blood Interferon Gamma Release Assay (IGRA) as an alternate supportive test for diagnosis of bovine tuberculosis in herds. Previously, the laboratory had observed that the intradermal test correlates well compared to the in-house IGRA, when the TB specific proteins ESAT6::CFP10 are used as a recombinant fusion antigen for stimulation of whole blood samples in the assay. Five hundred sixty-three samples originating from Gujarat, Tamil Nadu and Telangana were tested by the in-house IGRA and a commercial assay using the ESAT6::CFP10 antigen. The comparison of results indicated that both assays were statistically well correlated (κ=0.65).

The requirement for positive and negative serum panels for conducting diagnostic tests needs no emphasis. The R&D laboratory has initiated a programme for creating positive and negative serum panels for brucellosis, IBR, BVD, tuberculosis and FMD. During the period under report, a repository of more than 5,818

serum vials have been created for the above diseases. In addition, a panel of 10 plasma samples collected from IGRA and skin test TB positive animals have been also included in the repository.

Proprietary FTA® Cards are being increasingly used for molecular diagnosis of human diseases in developed nations. The major advantages of this sampling method are that it inactivates the infectious organisms and eliminates the necessity of transportation of liquid samples that might spill and complicate diagnosis, as well as does not require cold chain. The diagnostic protocol for bovine brucellosis by real-time PCR using specimens, transported by FTA® Card has been further improved and currently being routinely use in the laboratory.

Finally, gearing up in anticipation of an exponential increase in sample volume because of participation of much larger number of stakeholders in the future, essential steps have been taken to deliver high quality diagnostic services. All exercises, beginning with finalisation of protocols (SOPs/STPs) related to laboratory, instrumentation, manpower for submission to authorities for obtaining accreditation from the ISO have been completed. The laboratory infrastructure has been recently upgraded for high throughput and precision processing of samples, with the commissioning of two units of the automated Liquid Handling System (LHS) for conducting serological and molecular assays aided by the Robotic Sample Processing System (RSPS).

ANIMAL NUTRITION

STRAW BASED FEED PELLETS

Lignified bio-mass such as cotton stalks, soybean and mustard straws are not utilised in many parts of the country. In view of this, straw based feed pellets using 50 per cent soybean/ mustard straw and 50 per cent concentrate feed ingredients were prepared on a pilot scale and tested on lactating cows. Straw based feed pellets were found to be palatable to dairy animals and the daily feeding cost reduced significantly in animals fed on soybean and mustard straws based feed pellets. The possibility for commercial production of straw based feed pellets would be explored for their large scale use.

EFFECT OF FEEDING A BALANCED RATION ON SNF CONTENT OF MILK

The impact of feeding a balanced ration on Solids-Not-Fat (SNF) content of milk was studied in Ludhiana and Anand districts. On feeding a balanced ration for 8 weeks, there was significant improvement in the SNF content of milk from 7.86 to 8.54 per cent in cows and from 8.12 to 9.12 per cent in buffaloes. Average daily milk yield (kg) and fat (%) increased from 9.35 to 10.36; 4.13 to 4.27 in 40 cross-bred cows and from 7.54 to 8.25; 6.54 to 7.01 in 28 buffaloes, respectively. This translated into a daily monetary benefit of about ₹ 25 to 34 in cows and buffaloes, respectively. There was a significant improvement in rumen microbial protein synthesis, immune status and reduction in parasitic load. Similar encouraging results were also observed in 30 cross-bred cows in Anand district. These studies demonstrated that feeding a balanced ration not only helped in improving milk production and reducing the feeding cost, but also resulted in improving the SNF content of milk in cross-bred cows and buffaloes having low SNF.

BALANCED FEEDING AND ANTIBODY TITRES IN VACCINATED ANIMALS

Higher antibody titres are associated with greater resistance to disease. The immune response against FMD was estimated in vaccinated animals fed on traditional and balanced rations. A group of FMD vaccinated animals with Raksha Ovac Trivalent FMD vaccine was kept on traditional feeding, while the other group was fed a balanced ration. Blood samples were collected from animals in both the groups on day 0 and 30 post vaccination for measurement of antibody titers. The antibody titers for FMD sero-types A, O and Asia-1 were significantly higher in vaccinated animals fed on a balanced ration as compared to vaccinated animals fed on traditional ration. On feeding a balanced ration for 60 days, the levels of serum immunoglobulin, such as IgG, IgA and IgM increased from 22.4 to 28.5, 0.8 to 1.00 and 2.6 to 3.2 mg/ml, respectively. The present study indicates that balanced feeding helps in improving efficacy of vaccine and overall immune status of dairy animals.

Production of straw based feed pellets on a pilot scale

EFFECT OF TRACE MINERAL GLYCINE CHELATES ON REPRODUCTION EFFICIENCY

Poor nutritional status is the major constraints in the productive life span of bovine. Incidence of anoestrus and repeat breeding conditions are widely reported in India. Looking to the great importance, effect of glycine based chelated trace minerals (copper, zinc, manganese, chromium) on reproduction efficiency in anoestrus/repeat breeding animals was studied. Out of 44, 36 animals conceived on feeding a supplement for 60 days. The supplement was found to be effective in 82 per cent animals for curing anoestrous and repeat breeding conditions. The study indicates that glycine based trace mineral chelates are effective in improving reproduction efficiency in animals suffering from anoestrus and repeat breeding conditions.

EFFECT OF FEEDING A BALANCED RATION, USING BYPASS PROTEIN FEED ON METHANE EMISSIONS

Due to economic and environmental benefits of reducing methane (CH_4) emissions from dairy animals, there is a growing awareness among the researchers to think about its mitigation approaches. NDDB undertook a field study in Anand district of Gujarat to evaluate the effect of feeding a balanced ration prepared using bypass protein feed on CH_4 emissions. Methane emission was measured in 27 early lactating cross-bred cows using the sulfur hexafluoride (SF_6) tracer technique, before and after feeding a balanced ration. Ration of individual cows was balanced using bypass protein feed and fed for 30 days to all experimental cows. Feeding a balanced ration increased milk yield and fat yield by 4.6 and 6.1 per cent, respectively. Enteric CH_4 emissions (g/kg fat corrected milk yield) reduced by 21.0 per cent in cross-bred cows. Energy loss as CH_4 (% of gross energy) reduced from 11.6 to 10.8 on feeding a balanced ration, prepared with bypass protein feed to lactating cross-bred cows.

NUTRIENT USE EFFICIENCY

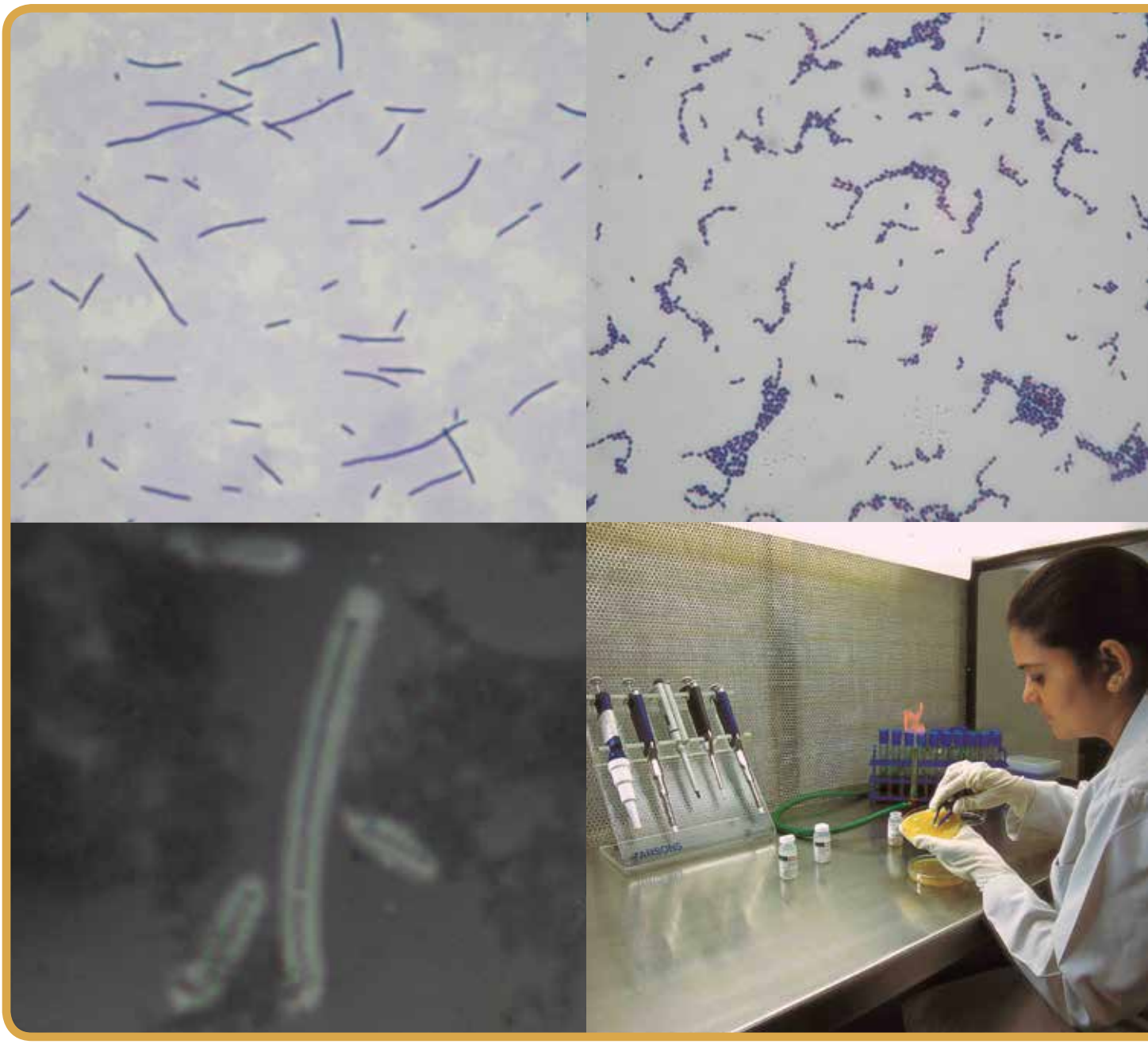
Improved efficiency of nutrient utilisation would allow increased productivity and reduced nitrogen (N) loss into the environment. Feeding a balanced ration using bypass protein feed reduced dry matter intake (kg/day) by 6.4 per cent, whereas, fat corrected milk yield increased significantly (kg/day) by 8.0 per cent in cross-bred cows. Dietary N intake and metabolisable energy intake reduced by 8.9 and 5.1 per cent, respectively, on feeding a balanced ration. Per cent dietary N excreted in manure reduced from 78.6 to 75.5, indicating improved N use efficiency. Balanced ration also improved energy use efficiency and feed conversion efficiency by 12.0 and 12.5 per cent, respectively. In the present study, feeding a balanced ration using bypass protein feed improved overall efficiency of nutrient utilisation in cross-bred cows.

LIFE CYCLE ASSESSMENT OF MILK PRODUCTION

A pilot study was conducted in Anand district of Gujarat to calculate the greenhouse gas (GHG) emission intensity per unit of milk, using a life cycle assessment model. Primary and secondary data were collected from 10 small holder dairy farmers, having total 50 numbers of animals in Jahangirpura and Sandesar villages of Anand district. A cradle-to-farm gate analysis was done, using economic allocation factor. Total GHG emissions included carbon dioxide, methane and nitrous oxide from feed production (cultivation, transportation, processing); methane emissions from enteric fermentation and nitrous oxide and methane emissions from manure management practices followed at the farm. Study indicates that the enteric CH_4 emission was the main contributor to overall GHG emissions. Average GHG emission intensity was 1.91 kg CO_2 equivalent per kg of fat and protein corrected milk.

CORRELATION BETWEEN *IN VITRO* AND *IN VIVO* METHANE MEASUREMENT METHODS

Methane emission measurements undertaken in Bangalore district of Karnataka, using SF_6 tracer technique, before and after feeding a balanced ration were compared with *in vitro* gas production method. Feed samples of experimental animals were collected and used to formulate total mixed rations (TMRs), to simulate the actual feeding conditions. Different sample size like 200 and 380 mg of each TMR (n=70) was incubated *in vitro* with rumen liquor for 24 hours in a laboratory and methane emission was measured. Present study revealed that there is a weak correlation between *in vitro* and *in vivo* methods of methane measurements.



Isolation and characterisation of indigenous dairy cultures

PRODUCT AND PROCESS DEVELOPMENT

In line with NDDB's mandate to support cooperative milk unions, NDDB signed a Technology Transfer Agreement for recipe and manufacturing process for fruit yoghurt with Kolhapur and Nainital Milk Unions. Lyophilised *dahi/mishti doi* starter culture was supplied to Surat Milk Union, Balaji Dairy and OMFED, Bhubaneshwar.

Standardisation of recipe for *chhana kheer* was completed and its shelf life is being studied. Preliminary trials for development of a whey based beverage, and a milk based beverage with *ragi* (finger millet) have also been completed.

NDDB also initiated setting up of a state-of-the-art laboratory for carrying out systematic research in the area of dairy starter cultures including production of starter culture concentrates in ready-to-use form.

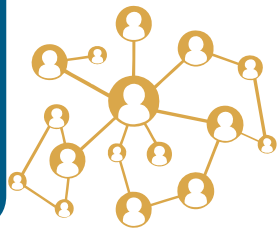
In continuation of the developmental work, in-house validation of the test for detection of adulteration of milk with anionic detergents has been completed. Preliminary trials of new detergent-cum-sanitizer formulation developed for cold cleaning of bulk milk coolers have been carried out and the results were encouraging.

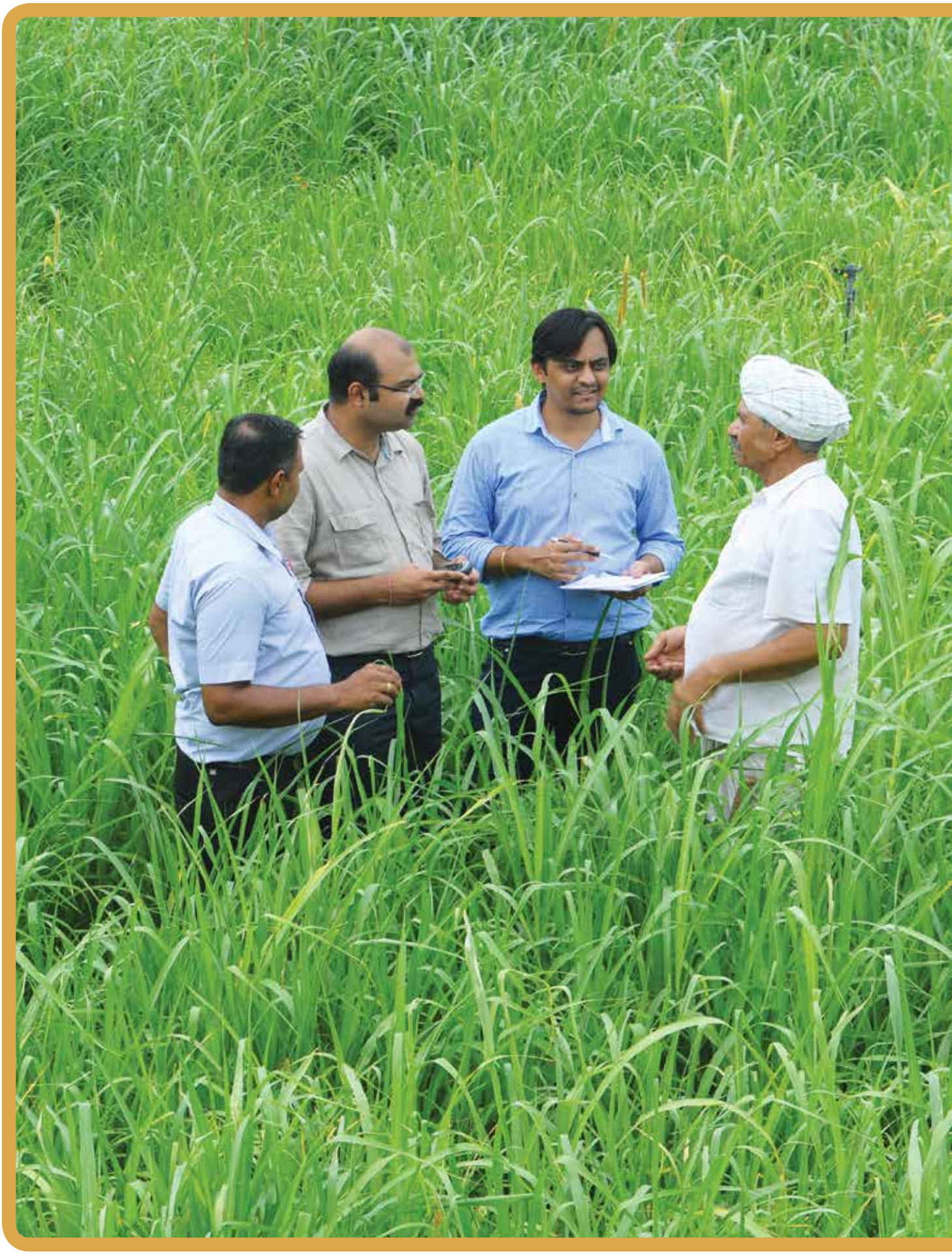
BUILDING AN INFORMATION NETWORK

NDDB compiles quality information through Internet Based Dairy Information System (iDIS), a networking medium with the dairy cooperatives for information sharing and dissemination, harnessing various published and unpublished sources, conducting studies and gathering insights to facilitate decision making.

INFORMATION BUILDING

Under NDDB's Internet-based Information Network, milk unions and federations continue to share data on physical progress in milk procurement, marketing, society organisation, cooperative membership, consumer prices of milk and related areas. Additionally, prices of cattle feed ingredients, fodder and dairy commodities are monitored across the country. For the first time, the dairy cooperatives of Meghalaya, Mizoram and Uttarakhand have been brought under the ambit of iDIS and on-site training was organised for the MIS personnel of these milk unions. Refresher training on iDIS was organised at Anand, Bhopal and Chennai to enhance skill and competency of MIS personnel for timely submission of data.





Collecting ground truth data to identify fodder crops using remote sensing

ESTIMATION OF MILK PRODUCTION AND MARKETABLE SURPLUS IN 8 DISTRICTS OF MAHARASHTRA

Presently, no published report is available at the sub-district level on milk production, marketable surplus and milk procurement by various agencies. In this direction, a survey was conducted in 1,472 villages of 8 districts namely Akola, Amravati, Buldana, Latur, Nanded, Osmanabad, Wardha and Yavatmal of Marathwada & Vidarbha regions of Maharashtra covering about 4.6 lakh households and 3.1 lakh milch animals. It was found that Vidarbha region had predominantly indigenous cows, while the buffaloes were in majority in Marathwada region. Every third household in the villages owned dairy animals, with a higher proportion of animal ownership in Latur and Osmanabad districts (around 50 per cent). About 50 per cent of the milk produced was sold by the producers. The private dairies, more prominent in Osmanabad and Latur districts, collected 40 per cent of surplus milk. The estimated milk production and marketable surplus in the five districts of Vidarbha stood at 15 lakh and 7 lakh litres per day, respectively, whereas the same was about 20 lakh and 11 lakh litres per day in the three districts of Marathwada.

MILK PRODUCTION AND SURPLUS STUDIES IN 10 DISTRICTS OF JHARKHAND

A survey to estimate milk production and marketable surplus at the district level was conducted in the ten districts of Jharkhand. The districts covered were Bokaro, Chatra, Dhanbad, Garhwa, Kodarma, Latehar, Palamu, Purbi Singhbhum, Sahibganj and Saraikela-Kharsawan. The survey found that every third household owned milch animals. Indigenous cows, mostly non-descript accounted for 74 per cent of total milch animals, but contributed to only 48 per cent in milk production. The yield of in-milk indigenous cows stood at 1.14 litres per day. Though about 60 per cent of the milch animal owning households reported milk production on the day of the survey, only 15 per cent MAH reported availability of surplus milk, indicating that milk production in the villages was primarily to meet household demand. The organised sector in milk trade was virtually non-existent. The districts of Dhanbad, Palamu and Sahibganj had relatively better potential in terms of milk production and marketable surplus.

BASELINE SURVEY FOR NPBBDD IN KARNATAKA

At the request of milk unions of Karnataka, NDDB conducted benchmark surveys in Bangalore, Kolar, Mandya and Tumkur Unions to establish baseline indicators for milk production, productivity of animals, procurement, processing infrastructure and marketing for monitoring and evaluation.

RAPID RURAL APPRAISAL TO ASSESS STATUS OF DAIRY DEVELOPMENT IN BARDHHAMAN DISTRICT

A Rapid Rural Appraisal (RRA) was conducted in Bardhhaman Union to assess the status of cooperative dairying. Despite high milk production in the area of operation of Bardhhaman Union, it has low cooperative coverage & low milk procurement and the performance of the Union that largely depends on autonomy in milk pricing, cooperative governance, input services and institutional structure. However, it was observed that AMUL has made considerable positive impact in providing market access to the producers, which has influenced milk production. There is a scope for setting up an alternative institutional structure for milk collection in the form of Women SHGs/Producer Company/ Farmers' Producer Organisation.

ESTIMATION OF QUANTITY AND VALUE OF FEED & FODDER CONSUMED BY BOVINE IN GUJARAT

The Directorate of Economics & Statistics (DES), Government of Gujarat, requested NDDB to conduct a study to estimate quantity and value of feed and fodder consumed by bovine in the state. The estimates to be generated from the study will be used for estimating agriculture GDP in a more refined way. The study is conducted in two seasons (lean and flush) and results will be aggregated into an annual estimate. The first round of the field-work has been completed in February 2015 and the second round will be conducted during July-August 2015. The study covered 57 villages selected from19 talukas and information on feed and fodder intakes of all animals of 1,400 milk producers have been collected following actual measurement method.

EVALUATION OF FLAGSHIP TRAINING PROGRAMMES

NDDB undertook a study to evaluate effectiveness of the flagship training programmes initiated under NDP-I like Business Appreciation Programme (BAP), New Field Supervisor Training on Milk Business & Producers Relationship Management (NFS) and Farmers Orientation Programme (FOP). For many of the respondents, especially from those who did not belong to Operation Flood milksheds, this was the first ever training they could attend, either within the state or outside. The major outcome of the training was increased awareness about "price of milk paid by the DCS" and that "DCS is owned by the dairy farmers themselves". The study also observed that the training programmes at NDDB succeeded in raising awareness about Clean Milk Production and disease control methods.

STATE REPORT ON DAIRYING

NDDB's efforts in providing data analytics in the areas of statewise dairy information continued during the year. Three state reports, Dairying – A Statistical Profile 2014 for the states of Karnataka, Punjab and Tamil Nadu were published and widely circulated across all functionaries of government, administrators, research institutions, academic and policy making bodies. This effort of NDDB has been well received by the user groups in dairy policy and planning in the country.

DESK RESEARCH

The analysis of NSSO Consumer Expenditure data of the 68th Round (2011-12), released during the year, indicated an upward trend in the household per capita consumption of milk in both rural and urban areas as also increase in the incidence of milk consumption. These developments suggest that aggregate demand for milk continues to be impacted by the positive changes occurring in the society.

A desk research on statewise value of output of milk in livestock sector indicate that in the states Gujarat, Himachal Pradesh, Punjab and Uttarakhand the contribution of milk in value of output from livestock is more than 80 per cent. Further, in Andhra Pradesh, Bihar, Gujarat, Punjab, Rajasthan and Tamil Nadu, the livestock sector accounts for 20-40 per cent of total value of output from agriculture and allied sectors.

CASE STUDIES

NDDB made efforts to document some success stories highlighting economic and social empowerment of women through dairying. These case studies were carried out in different regions covering 6 major dairying states.

COLLABORATIVE PROJECT WITH SPACE APPLICATION CENTRE (SAC), ISRO

NDDB & SAC-ISRO have jointly initiated a Pilot Project in Banaskantha district of Gujarat to (i) identify/ discriminate cropped areas between food crops and fodder crops, and (ii) identify suitable areas of current fallow and cultivable wasteland for cultivation of green fodder following remote sensing technologies. The preliminary estimate showed that fodder crops were grown in about 81,00 hectares of area and approximately about 57,000 hectares were current fallow land in *Rabi* season.

i-DGIS WEB APPLICATION

i-DGIS (Internet based Dairy Geographical Information System) is a strong visualisation tool, which incorporates GIS and database. i-DGIS is made available on the Internet platform by NDDB for interested Milk Unions/Federations.

Implementation of the i-DGIS has been initiated in Chhattisgarh, Madhya Pradesh and Odisha by providing requisite training to the officials of the Federation and all its associated Milk Unions.

National Dairy Development Board has been awarded the "Making the Difference" award at 15th ESRI India User Conference (UC) 2014 for the exemplary work done in creating WebGIS based decision support system that has the potential of enhancing the field-level planning process manifold for the cooperative milk unions in the country.

Further, ESRI Global, USA has selected NDDB to receive a Special Achievement in GIS award at the Global ESRI User Conference to be held on 22nd July, 2015 at San Diego, California, USA. This award is given to user sites around the world to recognise outstanding work with GIS technology.

DEVELOPING HUMAN RESOURCES

NDDB continued strengthening human resources for the implementation of NDP –I which included NDDB's flagship trainings for milk producers, executives and Board of Dairy Cooperatives.

A lot of focus was given on strengthening End Implementing Agencies/Union's Training Centres under National Dairy Plan and in strengthening & developing training facilities and processes.

During the year NDDB effectively trained 10,428 participants against the target of 8,600 (119 per cent). Under NDP, 3,143 milk producers, 476 village resource persons, 153 Board members and 1,292 executives were trained. Compared to the previous year, the participation of trainees increased by 23 per cent.

Demonstrating 'chopper loader' to the participants

A special executive programme for Lady Extension Officers from 23 Milk Unions across the country was conducted during the year. A five week long training programme on Dairy Plant Management was designed, organised and successfully conducted for 24 participants from 17 milk unions across eight states. The Regional Demonstration and Training Centres registered an increase in participation by 64 per cent compared to the previous year.

NDDB in association with Xavier Institute of Management, Bhubaneshwar, organised a cross learning workshop- "National Symposium on Women Empowerment through Dairying" at Bhubaneshwar. One hundred and eighty women from across six states interacted and shared their experiences during the workshop.

Customised training programmes in collaboration with milk unions for professionals from milk unions were conducted in different locations like KMF Bangalore, SRDTC, UTC Kolhapur and at Bhubaneshwar.

Training facilities at Anand and RDTC Jalandhar were upgraded to cater to the increasing number of participants. NDDB strengthened its training resources by creating a resource pool. It also developed a pool of 182 faculty through Training of Trainers (TOT) programme.

Keeping pace with modern communications and to increase its outreach, NDDB created a Whatsapp group of its trainees, launched itself in Twitter and Facebook. A mobile application on clean milk production was also launched during the year.

10,428 PARTICIPANTS WERE TRAINED AGAINST THE TARGET OF 8,600

Fodder demonstration for trainees

TRAINING PROGRAMMES

A. Cooperative Services		
Name of the programme	**No. of programmes**	**No. of Participants**
Farmer Orientation Programme	79	2,597
Farmer Induction Programme	44	1,427
Customised Farmer Orientation Programme	16	713
Board of Directors Orientation Programme	20	222
Training for P&I executives	25	467
Lady extension officers training	1	23
New supervisors training on Producer Relationship Management (PRM)	6	114
Training of Trainers on Business and Producer Relationship Management (PRM)	3	40
Management Committee Members (Dairy Cooperative Society) training	9	274
Total	**194**	**5,603**

B. Productivity Systems		
Training on Ration Balancing module of Information Network for Animal Productivity and Health (INAPH) software (Duration: One day)	2	19
Technical officers & trainers training on Rational Balancing Programme	12	189
Orientation on Progeny Testing (PT) & Pedigree Selection (PS)	9	40
Orientation on fodder production and conservation practices	5	89
Advanced Seed production technology	1	20
Customised programme for Animal Health officers	4	64
Artificial Insemination (Basic)	26	663
Artificial Insemination (Refresher)	15	406
Resource Person Training	26	529
Dairy Animal Management	32	708
Fodder Seed Production	11	207
Total	**143**	**2,934**

C. Quality Assurance		
Clean milk production	37	1,066
Wet chemistry analysis/NIR Calibration	1	2
Analysis of Fenbendazole in feed by HPLC	1	1
Analysis of Bypass fat	1	2
Student Internship project work on HPLC & Microbiology	2	2
Students internship- Training on instrumental analysis covering (HPLC/GC/ ICP-OES) and microbiology	1	4
Student Internship – Training on PCR/ICP OES/HPLC	1	6
Hygiene and sanitation- a scientific GHP approach for dairy plants	2	39
Quality & food safety measures	1	12
Quality & plant management	3	74
Energy conservation for increasing profitability	2	44
Operation & Maintenance of dairy equipment and management	6	123
Total	**58**	**1,375**

D. Sectoral Analysis and Studies		
Internet based Dairy Information System (i-DIS)	40	230
GIS training	1	23
Total	**41**	**253**

E. Other Trainings		
Orientation on World Bank procurement procedure	6	139
Trainers Training on INAPH	4	46
Training on environmental & social aspects under NDP-I	4	78
Total	**14**	**263**
GRAND TOTAL	**450**	**10,428**

SKILL BUILDING FOR ORGANISATIONAL DEVELOPMENT

Nurturing creativity and capacity building were the focus of development efforts during the year. An organisation-wide structured initiative titled "Ideas Forum" was introduced wherein employees participated in large numbers and shared their creative and innovative ideas focused on bringing improvements in existing programmes and embarking on new ones. A number of ideas articulated under the initiative are being taken forward in project mode for implementation.

Training programmes on Future Leadership Development through Mentoring, Training of Trainers, Team building, Project Management, Performance Management System focused on functional and organisational needs were organised in-house for NDDB employees. NDDB employees were also sponsored to specialised training programmes/ seminars and workshops organised by premier institutions. In all, 479 employees were trained during the year. NDDB also organised a seminar on "Cost Optimisation of Civil Building and Structures", wherein NDDB employees, senior professionals from Dairy Co-operatives and experts in the field participated and deliberated on the theme. Two induction programmes were organised for new inductees.

Under the "Knowledge Forum" initiative, lectures on contemporary themes by eminent personalities were organised wherein employees participated in large numbers.

TRAINING OF NDDB MANPOWER

Name of the Programme	No. of Programmes	Participants	
		Total	**SC/ST**
Project Management	03	52	06
Training of Trainers	02	39	04
Managing High Performance	01	20	
Performance Management System	02	36	
Future Leadership through Mentoring	03	48	
Team Building	02	28	09
Effectiveness in Supervision	02	33	
Individual and Team Effectiveness for Better Performance	03	43	02
Workshop on "Service and VAT"	01	49	04
Other programmes (sponsorship of employees at outside institutions	55	131	11
Total		**479**	**36**

Women the backbone of dairy industry

ENGINEERING PROJECTS

NDDB continued to provide consultancy services for execution of projects to milk unions across the country, creating new processing infrastructure and expanding existing facilities for dairy and cattle feed plants.

The services were also extended to execute Bio Security Labs and semen stations. The group also started the study of existing plants for improving energy efficiencies, ensuring food safety and reducing product handling losses.

Dairy plant expansion, Rajkot

9 PROJECTS WERE COMPLETED DURING THE YEAR

Nine projects were completed during the year. These included a fully automated Dairy Whitener powder plant of 100 TPD at Banas Dairy, Palanpur (Gujarat), automated Skimmed Milk powder plant of 20 TPD with Milk Processing Plant at Thiruvannamalai (Tamil Nadu), Fully Automated Liquid Milk Processing Plants of 450 TLPD at Rajkot (Gujarat) and 200 TLPD Liquid Milk Plant at Hosakote (Karnataka); Expansion of two Dairy Plants - 120 to 300 TLPD at Hassan Phase II (Karnataka) and 150 to 250 TLPD at Bhopal (Madhya Pradesh); and expansion of three Cattle Feed Plants - 150 to 300 TPD at Bikaner, 150 to 300 TPD at Ajmer (both in Rajasthan) and 150 to 300 TPD at Khanna (Punjab).

In addition to the above, NDDB completed renovation and up-gradation of Animal Quarantine facilities at Chennai, Delhi & Kolkata under NDP-I.

NDDB also carried out the infrastructure expansion of IRMA, Anand by creating additional Academic Block, Hostel Blocks and a dining hall.

NDDB maintained its emphasis to provide energy efficient state-of-the-art technology for setting up dairy & cattle feed plants for milk unions and federations. In order to improve the efficiencies of the existing plants, infrastructure studies of 16 dairy plants were carried out and recommendations along with required capital investment and payback period submitted to respective milk unions for up-gradation of the facilities. The sixteen dairy plants covered during the year include, Kolhapur, Pune, Jalgaon and Beed (Maharashtra), Jalandhar and Chandigarh (Punjab), Jaipur, Ajmer and Pali (Rajasthan), Madhavaram, Sholinganalur and Ambattur (Tamil Nadu), Noida, Meerut and Lucknow (Uttar Pradesh), and Belgachia (West Bengal).

100 TPD DAIRY WHITENER POWDER PLANT

NDDB commissioned the first fully automated 5 TPH dairy whitener plant in India. The plant at Palanpur is suited for 24x7 Hours for 21 days continuous operation. The plant has a fully automated packing facility to pack milk powder in 25 kg bags, 15 kg jars and retail packs.

The plant achieved the production of dairy whitener at rated capacity, with high degree of energy efficiencies and low water consumption.

CHEESE & WHEY POWDER PLANT

The execution of fully automated cheese and whey drying plant at Palanpur is progressing well and is targeted to be commissioned ahead of its scheduled date April 2016.

SEMEN STATIONS AND NDP-I

NDDB provided consultancy services for designing a new Semen Station with a capacity of 10 million semen doses per annum, being established by NDDB Dairy Services at Rahuri (Maharashtra) and Alamadi (Tamil Nadu). Work for the semen station at Alamadi has been completed. The execution of semen station at Rahuri is in progress.

NDDB provided engineering inputs for strengthening of existing semen stations under NDP-I. It carried out the assessment of 11 existing facilities which include 4 Semen Collection Stations, 3 AQCS, one Progeny Testing and one Embryo Transfer Centre for up-gradation of the infrastructure along with the cost estimates and conceptual drawings.

BIO-SAFE LABORATORIES

The BSL Project Cell, an offshoot of Engineering Services group, is responsible for setting up specialised R&D facility for animal pathogens where Bio-safety is of prime concern. Setting up of Bio-safety Laboratories and Experimental Animal Facility is a highly complex task necessitating an integrated approach in planning and implementation of multiple layers of bio-containment involving controlled climate with highly reliable HVAC and BMS systems. World over there are

limited Bio-containment facilities with BSL3+ and higher level laboratories.

THE MAJOR PROJECTS UNDERTAKEN BY THE BSL CELL DURING 2014-15 ARE:

BSL2- Lab Project for NIVEDI – ICAR, Bengaluru

A BSL2+ containment Laboratory designed to handle animal pathogens such as PPR, blue tongue etc with a view to diagnose, forecast and forewarning of animal diseases to control epidemic disease outbreaks in the country. The Laboratory has been successfully commissioned and handed over to the project authority in December 2014.

International Centre for Foot and Mouth Disease (ICFMD) a BSL3+ facility at Bhubaneswar

A prestigious state-of-the-art R&D facility of ICAR with BSL3+ laboratory & Animal Experiment Facility for conducting biomedical research in the area of Foot and Mouth Disease, (an highly infectious disease in animals affecting national economy). This facility shall also serve as a regional resource Laboratory for SAARC countries. The project is at an advance stage of construction.

Clean Room for Cell culture and Hybridoma and BSL2 Facility Lab at TANUVAS, Chennai

The clean rooms have been successfully completed and BSL2 Lab is at an advance stage of completion.

BSL4-Lab project for NIHSADL-ICAR, Bhopal

A prestigious state-of-art-high security diagnostic laboratory for animal diseases with BSL 4 levels of containment.

The project is under planning.

On-going Projects

Project	Capacity	Location
Northern Region		
Dairy Expansion	100 to 500 TLPD	Mohali, Chandigarh
Dairy plant Phase I (ETP & Boiler)	1,000 TLPD	Jaipur, Rajasthan
Cattle Feed Plant	150 TPD	Kaladera, Rajasthan
Western Region		
Cheese and Whey Powder Plant	30 TPD cheese/45 TPD Whey Powder	Banaskantha, Gujarat
Dairy Plant	200 TLPD	Bharuch , Gujarat
Infrastructure strenghthening IRMA Phase II		Anand, Gujarat
Semen Station	10 million doses/ annum	Rahuri, Maharashtra
Eastern Region		
Cattle Feed plant	150 TPD	Khurda, Odisha.
Mineral Mixture Plant & Bypass Protein Plant	12 MTPD/20 MTPD	Hotwar, Ranchi
Dairy Plant	50 TLPD	Hotwar, Ranchi
International Centre for Foot and Mouth Disease (BSL-3+)		Bhubaneswar, Odisha.
Southern Region		
Powder Plant and Dairy Plant Expansion	30 TPD PP/ 400-700 TLPD	Channarayapatna, Karnataka
Dairy Plant Expansion Phase II	100 – 325 TLPD	Tumkur, Karnataka
Product Dairy		Bengaluru, Karnataka
Dairy Plant	100 TLPD	Padalur, Tamil Nadu
Product Dairy		Ambattur, Tamil Nadu
Cattle Feed Plant	150 TPD	Erode, Tamil Nadu
Bio-Security Laboratory (BSL-2)		Bengaluru, Karnataka

TLPD – thousand litres per day, TPD – tonnes per day, pp – Powder Plant

THE NATIONAL DAIRY PLAN

National Dairy Plan Phase I (NDP-I) is being implemented by National Dairy Development Board (NDDB) in 16 states with the network of 130 End Implementing Agencies (EIAs). The project is a scientifically planned multi-state initiative with the total project outlay of ₹ 22,420 million.

PROJECT DEVELOPMENT OBJECTIVES

- Increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.
- Provide rural milk producers with greater access to the organised milk processing sector.

Women empowerment through dairying

SUB-PROJECT PROPOSAL

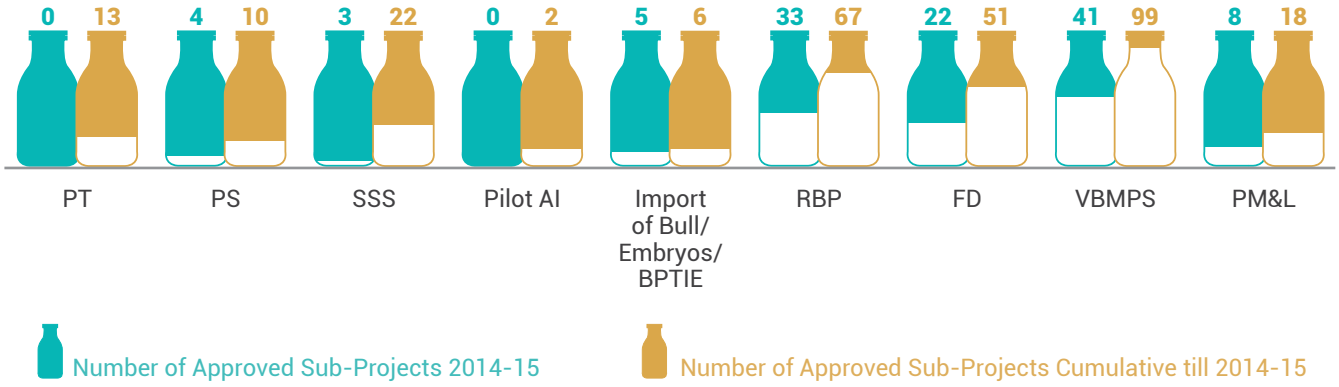
During 2014-15, 116 sub-projects with the total outlay of ₹ 3,994.04 million were approved out of which ₹ 3,192.21 million was grant assistance and ₹ 801.84 million would be contributed by the End Implementing Agencies.

Cumulatively under NDP-I, 288 sub-projects of 130 EIAs from 16 states have been approved with the total outlay of ₹ 15,480.67 million out of which ₹ 13,133 million would be grant assistance 75 per cent of the total grant assistance and ₹ 2,347.67 million would be contributed by the End Implementing Agencies.

STATUS OF APPROVED SUB-PROJECTS AND OUTLAYS TILL 2014-15 IS AS MENTIONED BELOW:

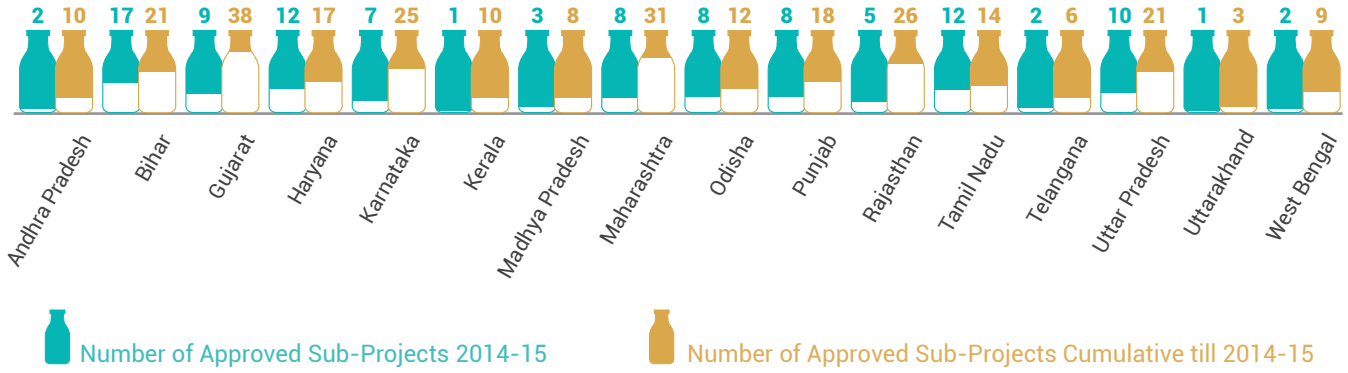
Activity	No. of Approved Sub-Projects		Amount in ₹ Million		
	2014-15	Cumulative till 2014-15	Outlay of Sub-Projects Approved cumulative till 2014-15		
			Grant Assistance	EIA Contribution	Total Outlay
Animal Breeding	**12**	**53**	**6,426.89**	**0.00**	**6,426.89**
Progeny Testing Programme	0	13	2,380.86	0.00	2,380.86
Pedigree Selection Programme	4	10	584.57	0.00	584.57
Strengthening of Semen Stations	3	22	2,555.62	0.00	2,555.62
Pilot AI Delivery Services	0	2	362.60	0.00	362.60
Import of Bulls/Embryos/BPTIE	5	6	543.23	0.00	543.23
Animal Nutrition	**55**	**118**	**2,613.09**	**0.00**	**2,613.09**
Ration Balancing Programme	33	67	1,870.53	0.00	1,870.53
Fodder Development	22	51	742.56	0.00	742.56
Village Based Milk Procurement System	**41**	**99**	**3,843.62**	**2,347.67**	**6,191.29**
Sub-total	**108**	**270**	**12,883.60**	**2,347.67**	**15,231.27**
Project Management & Learning	**8**	**18**	**249.40**	**0.00**	**249.40**
Total	**116**	**288**	**13,133.00**	**2,347.67**	**15,480.67**

ACTIVITY WISE SUB-PROJECTS APPROVED ARE AS MENTIONED BELOW:



Abbreviations: PT- Progeny Testing, PS- Pedigree Selection, SSS- Strengthening of Semen Stations, RBP- Ration Balancing Programme, FD- Fodder Development Programme, VBMPS- Village Based Milk Procurement System, PM&L- Project Management and Learning

STATE WISE SUB-PROJECTS ARE AS MENTIONED BELOW:



KEY PRIORITIES DURING 2014-15

Projects from states with less coverage of NDP-I

- During the year, 52 sub-projects were approved from Bihar, Haryana, Madhya Pradesh, Odisha and Tamil Nadu

Monitoring of Programme Implementation

- 14 regional review meetings were organised to review the progress of approved sub-projects
- Monitoring Officers of NDDB visited assigned sub-projects to provide implementation support

To initiate impact study and documentation of success stories

- Special Studies on women empowerment were initiated
- The success stories reported during the course of implementation of NDP-I have been compiled

Financial Audit and Post Procurement Review Audit

- During the year, financial audit was undertaken for 26 EIAs and post procurement audit for 20 EIAs by External Agencies

Environment and Social Management Plan

- Environment and Social Management Plan (ESAP) is being built in the new as well as in already approved sub-projects
- Capacity building of field functionaries and milk producers
- More than 1.85 lakh participants have been provided with training and awareness programme under NDP-I

PRODUCTION OF HIGH GENETIC MERIT CATTLE AND BUFFALO BULLS

Genetic improvement of the milch animals is one of the key focus area of NDP-I wherein the focus is to make available High Genetic Merit cattle and buffalo bulls of different breeds to semen stations for production of High quality disease free semen doses for artificial insemination. Under this intervention following four activities are being undertaken:

- Progeny Testing Programme: Making available High Genetic Merit bulls of major dairy breeds of cattle and buffalo: Pure Holstein Friesian, Cross-bred Holstein Friesian, Cross-bred Jersey, *Mehsana* and *Murrah*
- Pedigree Selection Programme: Making available High Genetic Merit bulls of indigenous breeds of cattle and buffalo making interventions in their native tract: *Gir, Kankrej, Hariana, Rathi, Tharparkar, Sahiwal, Jaffarabadi, Nili-Ravi* and *Pandharpuri*
- Import of Embryos of Pure Holstein Friesian and Jersey bulls and bull production in India through embryo transfer
- Import of Pure Holstein Friesian and Jersey bulls and its distribution to Semen Stations for semen production

Thirteen Progeny Testing sub projects are under implementation by 12 EIAs in nine states. These EIAs have made available 212 High Genetic Merit bulls for distribution out of which 205 bulls have already been distributed. Bull distribution committee has distributed these bulls to 16 "A" and "B" graded semen stations.

Under the Pedigree Selection programme, till March 2015, 10 sub-projects for indigenous breed development are being implemented by eight EIAs operating in five states. During the year 2014-15, four sub-projects for production of bulls of *Nili-Ravi, Tharparkar* and *Sahiwal* breeds were approved. Pedigree selection programme has made available 31 High Genetic Merit bulls for distribution out of which six bulls have already been distributed to three "A" and "B" graded semen stations.

One of the major constraints during the initial stages of implementation of animal breeding sub-projects had been the reluctance of farmers to get their animals ear tagged as the farmers had a misconception that the animals are to be identified only when they are purchased with bank loan or for its insurance.

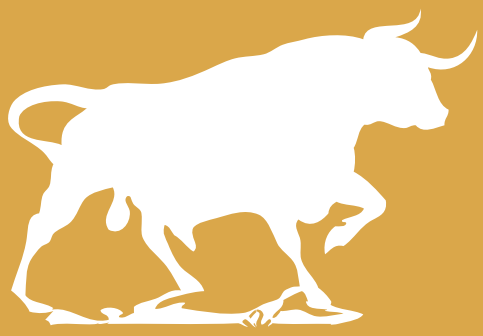
Sub-projects have initiated awareness programmes on fodder conservation, water conservation and proper disposal of biomedical waste from Artificial Insemination.

An innovative intervention has been undertaken by *Sabarmati Ashram Gaushala* to produce frozen semen doses from elite bulls kept at various *Gaushalas* under field conditions to increase its acceptance by farmers.

***Sabarmati Ashram Gaushala** is implementing Pedigree Selection Programme in Bhavnagar and Junagadh Districts of Gujarat for Gir cows and Jaffarabadi buffaloes. The acceptance of Gir semen by farmers having elite Gir cows was less and many farmers were opting for natural service with local bulls.*

To change this common practice and to provide impetus to the project, SAG found two elite herds of Gir cows, one at Kundal village of Bhavnagar district belonging to Swaminarayan Sansthan, and another herd at Rajmoti Gaushala, Kodinar in Junagadh district, owned by Shri Dinubhai Solanki. They were requested to allow collection of semen from bulls being used by them for their respective herds which they agreed on continuous persuasion.

The herds were screened for Brucellosis and the bulls identified for semen production were screened for TB, JD, Brucellosis and IBR. A special mobile van was fitted with sophisticated equipment for semen processing. The semen collection from these bulls, which are very shy, aggressive and habituated to natural service, was very difficult. After one week of continuous efforts at Kundal Gaushala, the team could produce 120 Frozen Semen Doses from one bull. At Kodinar, the success came a little later, where 1,482 Frozen Semen Doses were produced from four bulls.



The semen doses produced were quarantined for one month and now the semen doses are ready to be used in the field. The project is planning to publicise this in the local area along with the photographs of the bulls and other details. The elite female animals will be bred on priority with these semen doses for production of next generation of Gir bulls.

After a long gap of about 15 years, 76 purebred Holstein Friesen bulls were imported in India from Germany. Out of 76 bulls, 40 were delivered at Chennai and 36 at Kolkata airports, respectively. Bulls were stationed at both the places (Chennai and Kolkata) for 30 days' mandatory quarantine. After successful completion of quarantine period, HF bulls were distributed to 14 "A" & "B" graded semen stations for production of semen doses.

Sabarmati Ashram Gaushala has obtained the license to import 480 embryos of Holstein Friesian and Jersey breeds and the embryos are expected to arrive in two consignments by May and August 2015. Sub-projects of four End Implementing Agencies have been approved in 2014-15 for production of bull calves from imported embryos Embryo Transfer (ET). A Canadian expert provided the latest know-how to ET Practitioners of these EIAs to prepare them for bull production activity through imported embryos.

STRENGTHENING OF "A" AND "B" GRADED SEMEN STATIONS

Under NDP-I, "A" and "B" graded semen stations are being supported to expand and upgrade the facilities to produce high quality disease free semen doses for artificial insemination. Till March 2015, 22 projects of 19 EIAs have been approved for strengthening of "A" and "B" graded semen stations from 14 states. Civil works for most of the Semen Stations were initiated during the year.

A bio-gas plant with a capacity of 85 CMT was commissioned at SAG, Bidaj and loading of dung in the plant and power generation has started. Annual evaluation of 17 sub-projects was undertaken during January-March 2015. In the approved sub-projects, vaccination is being carried out in the project areas in coordination with the State Animal Husbandry Departments.

An international workshop on "Bovine Semen Production and Processing" for semen station officers was organised in October 2014 at NDDB. Foreign experts from the USA, Brazil, New Zealand, Germany and Denmark were also invited to share their experiences with the participants. A workshop on "Revisiting Minimum Standards (MS) for Bovine Frozen Semen Production" was held during 12-13 March 2015 to review and revise the MS based recommendations made during the International Workshop.

A workshop was also organised on "Management of Exotic animals" at Chennai on 15 February 2015 wherein participants from around 10 semen stations participated. A German expert delivered a presentation on management and handling of imported bulls.

PILOT DOORSTEP AI DELIVERY SERVICES

Pilot model for viable doorstep AI delivery services is being set up to operate in a financially self-sustainable manner using Standard Operating Procedures including animal tagging and performance record. Two sub-projects of Paayas and Maahi Producer Companies are being implemented in Gujarat and Rajasthan. To increase the coverage of the Pilot Doorstep AI Delivery Services under NDP-I, the National Steering Committee approved inclusion of Dairy Cooperatives/Milk Federations and other experienced and professional AI service providers as End Implementing Agencies. 685 Mobile AI technicians operating in 4,802 villages carried out 1.6 lakh artificial inseminations in 2014-15 with a conception rate of 46 per cent.

Initially, farmers believed that natural service is better than artificial insemination which was a belief reinforced by low conception rate observed through services of private practitioners. Training and follow-up of MAITs has led to better performance of the technicians as well as adoption of AI.

Village Dhamba Ka Bas of Jaipur District in Rajasthan has 400 households with a milch animal population of 900. In the village there was a common belief among the villagers that natural service is better that AI services for conception of animals and buffaloes can never conceive through AI. Artificial Insemination was preferred only for those animals which do not conceive through natural services.

Shri Kajod Yadav, resident of village Dhamba Ka Bas, Jaipur District, Rajasthan, had invested a lot of money in artificial insemination of his animal for more than 10 times during past 8 months without any results. The private AI worker was charging more that ₹ 150 per AI. The cow had produced more than 3,500 Litres milk in the last lactation and the cow not getting pregnant was a considerable economic loss for Shri Kajod. Finally, he decided to sell his animal to the Banjara community for slaughtering.

Paayas Producer Company started its operations in the village providing doorstep AI delivery services under NDP-I and Shri Ramesh Kumar Sharma was appointed as Mobile AI Technician (MAIT). Village meeting was organised to raise awareness on benefits of quality AI delivery services following the standard operating procedures (SOPs). Shri Ramesh performed AI on Shri Yadav's animal which conceived in the first insemination.

The success of AI in the animal of Shri Kajod and other farmers has changed the belief of the farmers who now prefer AI over natural services. Now Shri Kajod Yadav has become a spokesman for AI delivery services and is advocating it to other milk producers.

RATION BALANCING PROGRAMME

Ration Balancing of milch animals using locally available feed resources have shown encouraging results and its acceptance to the farmers have increased significantly. Under this programme, Local Resource Person (LRP) formulates a least cost balanced ration from locally available feed resources using the software Information Network for Animal Productivity and Health (INAPH). Balanced Ration to milch animals helps in ensuring that the milch animals produce milk commensurate with their genetic potential. Feeding the balanced ration to milk animals not only reduces the cost of feeding per kg of milk but also helps in significantly reducing methane emissions.

During 2014-15, 33 new sub-projects on Ration Balancing Programmes were approved and cumulatively till Mar 2015, 67 sub-projects of 65 EIAs have been approved in 14 states.

Under Ration Balancing Programme, sub-projects have covered 8,645 villages through 7,607 Local Resource Persons and covered 5.77 million milch animals. More and more women are coming forward to work as Local Resource Person and more than 19 per cent of the LRPs were women. Out of the total farmers covered under RBP advisory services, 33 per cent were women, 14 per cent SC and ST farmers and 70 per cent small holders.

To popularise the use of RBP, Information, Education and Communication (IEC) materials are extensively being used which include, pamphlets, wall paintings, posters, banners and documentaries.

The convergence of Ration Balancing Programme with Progeny Testing and Pedigree Selection Programme is being ensured through close coordination between these sub-projects. For effective implementation and monitoring with respect to convergence, general guidelines/standards of RBP implementation in PT/PS area have been prepared and shared with the field functionaries.

One of the key impacts of the Ration Balancing Programme is the reduction in emission of methane from dairy animals.

National Dairy Research Institute (NDRI) has conducted a study on methane emission from RBP. The NDRI study has reported Methane Emission reduction of 12 per cent due to feeding balanced ration to milch animals.

The INAPH database of RBP advisory services indicates that cost of feeding per kg of milk has reduced on an average by about 11 per cent and net daily income of farmers per animal has increased by about ₹ 25 per day. The story described below illustrates this:

A local resource person providing ration balancing advisory services at farmer's doorstep

FODDER DEVELOPMENT PROGRAMME

Under Fodder Development activities, certified/truthfully labelled seeds are being promoted to increase fodder production and also field demonstrations of mowers, silage making and biomass bunkers are being carried out to popularise these technologies among farmers.

During 2014-15, 22 Fodder Development sub-projects have been approved and cumulatively till Mar 2015, 51 sub-projects have been approved. Under the approved sub-projects, six Fodder Seed Processing Plants and two Straw Enrichment and Densification Plants would be installed. 20 Micro Training Centres (MTC) in 10 EIAs have also been approved wherein the milk producers would be provided practical training by the successful dairy farmer at his/her farm on improved fodder technology.

During 2014-15, six EIAs have set up 10 Micro Training Centres (MTC). Two Seed Processing Plants comprising of precise Cleaner cum Grader, Gravity separator and Treater have been installed and commissioned at Kolar and Vijayawada while at Raichur-Bellary and Lucknow civil works are in advance stage of completion. Civil work of Enrichment and Densification Plant at Sriganganagar is in progress and civil work plan has been prepared for Kolhapur plant.

Extension material in the form of a small documentary film on green fodder production was prepared. EIAs are also developing poster, banners, demo signage and pamphlets to propagate improved fodder production technologies.

Till March 2015, about 410 mower demonstrations and over 575 silage making demonstrations have been organised. Around 19 Bio-mass bunkers were constructed and re-vegetation of 54 hectares of fallow land was completed.

The technologies of mowers and silage production are useful for farmers to reduce wastage of crop residue, increase period of availability of fodder, saving on purchase of costly dry fodder during lean season, and increase in productivity of the milch animals.

"Aachar (Silage) is the best form of green fodder I have ever used to feed my cattle. It has made my life simpler and cattle love to eat it" were the first lines from Smt. Baljinder Kaur on silage making.

Smt. Baljinder Kaur is a resident of Kalvan village of Anandpur Sahib Tehsil in Ropar District of Punjab. She is a landless milk producer owning four cows. She is the only earning member in her family. The only source of her household income is dairying and she pours around 20 litres of milk daily to the dairy cooperative society. For arranging fodder for her animals, Smt. Baljinder Kaur used to take a fodder field on rent and harvest fodder. Smt. Baljinder Kaur opted for silage making and a demonstration was organised. After 45 days when she started feeding the silage to her cattle, she was extremely happy with the results in terms of time saved on daily labour work, reduced requirement of dry fodder and enhanced milk production. Now it was comparatively easier to feed the animals with minimum amount of daily labour in bringing and chaffing the fodder. The requirements of dry fodder and cattle feed were also reduced.

A comparative analysis of her savings on feeding costs per day per animal, before and after silage feeding indicates that apart from reduction in the cost of feeding, the milk production also increased by 0.5 to 1 kg per animal per day. Silage making has simplified her life and now she has more time to attend to her husband and take care of her children.

Silage making demonstration under NDP-I

VILLAGE BASED MILK PROCUREMENT SYSTEM

Village Based Milk Procurement System aims at providing rural milk producers with greater access to the organised milk-processing sector and also provide support to End Implementing Agencies for establishment of village-level infrastructure for milk collection, testing and cooling.

Apart from forming new societies and pooling points, existing societies and pooling points are also being strengthened by providing them village level capital items like Bulk Milk Coolers, Automated Milk Collection Units, Data Processor based Milk Collection Units, Milk Cans, etc.

For ensuring maximum women participation, efforts are being made for organisation of all women DCS.

For direct milk payment to pourers efforts are being made to open bank accounts of the milk pourers under the Pradhan Mantri Jan Dhan Yojana.

Till March 2015, 12,540 villages were covered and more than 3.90 lakh additional milk producers have been organised or enrolled.

Strengthening of existing cooperatives through installation of DPMCUs and AMCUs has resulted in more transparency in milk procurement and with installation of BMCs farmers have more flexibility in pouring milk.

The DCS of Garmunda village in Odisha was a mixed DCS earlier and was not operating properly. When some of the active women dairy farmers of the village came forward to shoulder the responsibility of operating the DCS, it was converted to a women DCS. Ms. Minati Budek, aged 45 years, having education up to 8th standard came forward and joined as secretary of the Women DCS.

In October 2014, a DPMCU was installed in this Women DCS. Now the members are able to see the FAT and SNF and get right price for their milk. Milk pourers convey that the price of milk on an average has increased by ₹ 5 to ₹ 7 per litre of milk which is an additional income to them.

In the first day, milk collection of the DCS was only 15 litres which increased to 100 litres within a year, and at present milk collection of the DCS has reached up to 210 litres. Currently, there are 136 women members in the DCS.

Ms. Minati Budek, the secretary of the DCS informs with pride "milk producers had lost confidence and had stopped supplying milk to the society but when I took over the charge and DPMCU was installed under NDP-I the milk procurement has gradually increased."

TILL MARCH 2015, ABOUT 410 MOWER DEMONSTRATIONS AND OVER 575 SILAGE MAKING DEMONSTRATIONS HAVE BEEN ORGANISED

Local resource persons attending training on ration balancing

PROJECT MANAGEMENT AND LEARNING

NDP-I project monitoring and evaluation system focusses on ICT based Management Information System and facilitates learning by internal and external monitoring and special studies.

Various ICT based MIS applications are being used for reporting and analysing the progress made:

- Enterprise Project Management (EPM)
- Information Network for Animal Productivity & Health (INAPH)
- Procurement MIS (ProcMIS)
- Grievance Redressal System (GRS)
- Fund Utilisation Tracking System

For facilitating effective monitoring of the approved sub-projects and to provide implementation support to EIAs implementing the sub-projects:

- Each of the approved sub-project has been assigned to a monitoring officer to monitor and support EIAs.
- NDP-I regional review meetings are being organised at regular periodicity to review the progress made, identifying the bottlenecks/shortcomings, highlight the success and work out the future action plan etc. During the financial year 2014-15, 14 regional review meetings have been organised.

EXTERNAL MONITORING AND EVALUATION FOR NDP-I

The Annual Round-I of External Monitoring and Evaluation for NDP-I was finalised, during the year.

The survey for the second Annual Round was initiated by the external agency. The field-work for the second annual round for monitoring the Project Development Objectives level indicators of NDP-I with a specific theme on "Role of Dairying in Human Nutrition" has been completed.

TRAINING AND CAPACITY BUILDING

During the year 2014-15, various training and capacity building programmes were organised to orient the farmers, field functionaries and EIAs personnel towards the implementation of NDP-I as well as to upgrade the skills. During the year 2014-15, more than 1.85 lakh participants were trained in various programmes organised by NDDB and EIAs. Cumulatively, 2.46 lakh participants have been trained under NDP-I.

Training Programmes organised by NDDB	Component	Category of Participants	2014-15	Cumulative till March 2015
Farmers Induction	VBMPS-Coops	Milk Producers	1,966	4,860
Farmers Orientation			1,349	4,089
Board Orientation		Board of Directors	159	319
Business Appreciation		Executives	396	1,051
Training of Trainers			40	117
New Supervisors Training			114	298
Sub-total			**4,024**	**10,734**
Training of Technical Officers on RBP	Ration Balancing Programme-Coops	Executives	82	188
Refresher training on Training of Trainers			29	29
Training of Information Technology on RBP			14	28
Sub-total			**125**	**245**
Training of Technical Officers on RBP	Ration Balancing Programme-PC	Executives	20	42
Refresher training on Training of Trainers			2	2
Training of Information Technology on RBP			4	4
Sub-total			**26**	**48**
Fodder production & conservation practices	Fodder Development-Coops	Executives	87	159
Sub-total			**87**	**159**
Fodder production & conservation practices	Fodder Development-PCs	Executives	4	16
Sub-total			**4**	**16**
Orientation/refresher to AIOs	Progeny Testing	Executives	22	44
Orientation/refresher to Project Coordinators			3	13
Orientation/refresher to District Coordinators			21	39
Orientation/refresher to Calf Rearing In-charges			3	8
Sub-total			**49**	**104**
Orientation/refresher to Project Coordinators	Pedigree Selection	Executives	4	8
Orientation/refresher to Area Coordinators			3	9
Sub-total			**7**	**17**
Basic AI training for MAIT	Pilot AI Delivery	Village Resource Person	296	296
Sub-total			**296**	**296**
Total			**4,618**	**11,619**

ENVIRONMENT AND SOCIAL MANAGEMENT

NDP-I focuses on mainstreaming environmental and social safeguards viz., social inclusion, management of natural resources and mitigating environmental impacts. The key activities being undertaken to ensure this include:

- Each of the sub-project have been appraised/screened on environment and social management aspects
- Implementation of Environment and Social Action Plans in sub-projects
- 123 sub-projects have been supported for undertaking specific Environment and Social Action Plans
- Monitoring of environment and social activities.

The NDP-I lays emphasis on inclusive development for SC and ST households through awareness camps on dairying, awareness on government schemes for skill building, livelihoods and education, improving membership of STs in village level cooperatives, and selection as Field Functionaries (Local Resource Persons, AI Technicians, DCS Secretary).

FINANCIAL MANAGEMENT

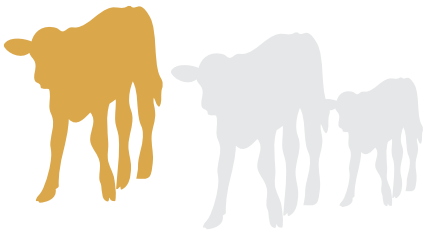
Till March 2015, DADF has released ₹ 4,307.94 million for implementation of NDP-I out of which ₹ 4,232.41 million has been released (advance to EIAs and expenditure on centralised activities) and ₹ 2,868.20 million has been the utilisation reported through Fund Utilisation Certificates by EIAs and expenditure of centralised activities. Additionally, ₹ 596.34 million has been contributed by End Implementing Agencies in procurement of capital assets under Village Based Milk Procurement System.

The statutory audit of NDP-I for the financial year 2013-14 has been completed and the internal audit is also up to date.

KEY ACHIEVEMENTS: NATIONAL DAIRY PLAN PHASE I

- 288 sub-projects approved from 16 states from 130 EIAs with total outlay of ₹ 15,480.67 million
- 243 Bulls made available for distribution under Progeny Testing and Pedigree Selection Programmes and 211 bulls have been distributed to Semen Stations
- 76 Holstein Friesen Bulls imported from Germany after a long gap of 15 years and distributed to "A" and "B" graded Semen Stations
- 22 approved Strengthening of Semen Stations sub-projects produced 68 million semen doses in 2014-15
- 4,802 villages covered by 685 MAITs under Pilot doorstep AI Delivery Services
- 5.8 lakh Animals covered in 8,645 villages under Ration Balancing Programme with about 11 per cent reduction in cost of feeding per kg of Milk

MORE THAN 3.9 LAKH ADDITIONAL MILK PRODUCERS ENROLLED UNDER VBMPS



5.8 LAKH ANIMALS COVERED IN 8,645 VILLAGES UNDER RATION BALANCING PROGRAMME WITH ABOUT 11 PER CENT REDUCTION IN COST OF FEEDING PER KG OF MILK

- 12 per cent reduction in Methane Emission has been reported due to balanced feeding
- 986 Fodder Demonstrations organised under Fodder Development Programme
- More than 3.9 lakh additional Milk Producers enrolled under VBMPS out of which about 42 per cent are women and 59 per cent are Small Holders and additionally about 3.4 lakh farmers members have also been the beneficiaries from the interventions
- External Monitoring and Evaluation agency has completed baseline survey and two annual round of surveys with themes Women Empowerment and Nutritional Security
- Quality Assurance of Civil works and Goods under framework agreement (BMC, Cans, LN Container) is being ensured by External Agencies
- Financial Statement of NDP-I and 26 EIAs have been audited by M/s Deloitte Haskins & Sells
- 60 EIAs have been covered in three phases to review procurement by EIAs under NDP-I
- 123 sub-projects have been funded for Environment and Social Action Plan
- 14 Regional Review Meetings were organised during 2014-15 to review approved sub-projects

KEY IMPACTS UNDER NATIONAL DAIRY PLAN PHASE I

- Network of 130 End Implementing Agencies implementing 288 sub-projects to meet the overall objectives of NDP-I
- National framework for Key Policy and Regulatory Measures has emerged
- Scientific animal breeding and nutrition interventions have been undertaken
- Framework Agreement for procurement of goods has been introduced
- Import of Bulls in India after a long gap of about 15 years
- Various workshops/seminars have been organised to for scientific implementation of activities
- New technologies have been used/demonstrated like Ration Balancing Programme, Mower/Silage demonstrations, Doorstep AI delivery services on full cost recovery basis, Milk analysers for testing of milk etc.
- The sub-projects are following laid down minimum standards and SOPs which has ensured quality output

NDP-I interventions are expected to put India on the path of improving the genetics of milk producing animals in a consistent manner and also benefit the rural milk producers who are bedrock of the India's milk production system.

Dairying a source of livelihood

CENTRE FOR ANALYSIS & LEARNING IN LIVESTOCK AND FOOD (CALF)

1,800

SAMPLES OF MINERAL MIXTURE AND MINERAL SALTS WERE ANALYSED

The laboratory excels in providing effective, high quality analytical services in animal feed, mineral salts, mineral mixture, milk and milk products, food, fruits & vegetables and genetic testing services for animals to the dairy cooperatives and private agencies, by keeping a clear focus on customer requirements, using motivated, skilled, adaptable, expert staff and by employing state-of-the-art technology.

Analysis of heavy metals by ICP-MS

ANALYSIS OF CATTLE FEED RAW MATERIALS AND FINISHED PRODUCT

To ensure quality of feed and feed supplements produced by the feed plants, the laboratory continued to provide analytical services to the feed plants, by testing compound cattle feed, bypass protein feed, calf starter, pregnancy feed and their raw materials for different parameters. More than 2,900 samples were analysed during the year.

ANALYSIS OF MINERAL SALTS AND MINERAL MIXTURE

During the year, 1,800 samples of mineral mixture and mineral salts were analysed for various macro and micro-minerals, using Inductively Coupled Plasma-Optical Emission Spectroscopy/ Mass Spectrometry (ICP-OES/MS) and Ion Analyser.

TESTING OF MILK AND MILK PRODUCTS FOR NUTRITIONAL VALUE

The Laboratory undertook the analysis of various milk products like skimmed milk powder, cheese and *shrikhand* as per BIS specifications for the compositional parameters. The samples were also analysed for the nutritional parameters like Vitamins A, E, beta carotene, B-complex vitamins (B1, B2, B3, B5, B6, B7, B9 and B12), fatty acid profile, cholesterol and sugar profile.

MICROBIOLOGICAL ANALYSIS OF MILK AND MILK PRODUCTS

The Laboratory checked various milk products for microbiological parameters covering pathogens (*Escherichia coli, Salmonella, Shigella, Staphylococcus aureus, Listeria monocytogenes, Clostridium sp* and *Bacillus cereus*) and hygiene indicators (total plate count, yeast & mould and coliform count).

HEAVY METALS AND AFLATOXIN M1 IN MILK AND MILK PRODUCTS

Contamination of milk with undesirable substances via animal feeds, like heavy metals, mycotoxins, dioxins and similar pollutants is considered to be of great concern due to their toxic effects on human health. During the year, about 130 samples of different milk products were tested for heavy metals and aflatoxin M_1 content. In most of the milk and milk products, heavy metals were less than quantifiable levels and were present well below the regulatory limits. Aflatoxin M_1 in liquid milk was within the FSSAI's permissible limit of 0.5 µg/kg.

DIAGNOSIS OF GENETIC DISEASES IN DAIRY ANIMALS

For the field Progeny Testing (PT) programme, only proven bulls are selected. Since selection of bulls largely depends on the performance of the daughters of bull, correct recording of sire and dam (parents) from which a calf born, is very crucial. The Laboratory provides services to identify the biological parents of the calves born out of Artificial Insemination (AI), through DNA fingerprinting based on thirteen different microsatellite markers. The Laboratory screened about 4,300 families for parentage verification under the PT programme, 25 per cent of screened animals were of wrong parentage. In a correct parentage, progeny will be having one allele from each of the parents i.e. dam and sire, while in a wrong parentage allele present in the progeny will not be matching with one of the parents. The figures indicate examples of correct and wrong parentage.

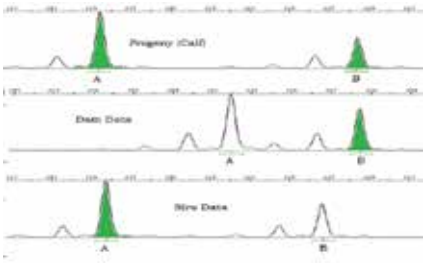


Fig. 2: Sire qualifies as progeny has inherited its two alleles, one each from Sire and dam. Progeny's allele A matches with sire and allele B matches with dam.

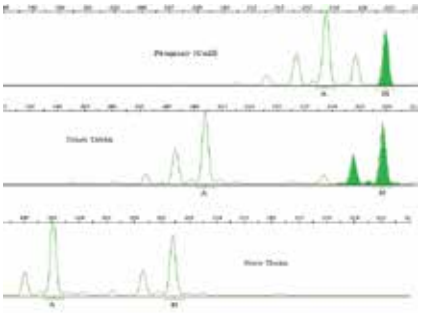
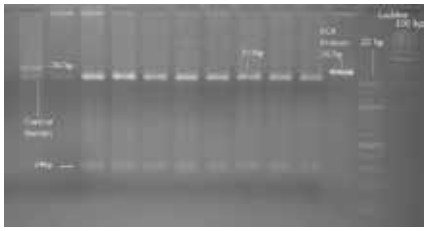
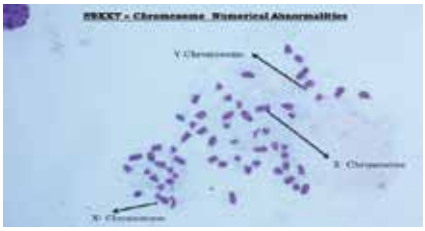


Fig. 3: Sire Excluded as progeny did not inherit allele A from Sire.

The Laboratory has been screening both cattle and buffalo male calves for genetic disorders like Bovine Leucocyte Adhesion Deficiency (BLAD) Syndrome, Citrullinaemia, and Deficiency of Uridine Monophosphate Synthase (DUMPS) and Factor XI (FXI) deficiency. The affected animals exhibit symptoms of the disease, while carrier animals do not show the symptoms, but are capable of transmitting the mutated gene in the progeny. During the year, the laboratory screened 743 animals each for BLAD, Citrullinaemia,



Gel electrophoresis image indicating carrier animal for BLAD.



Slide depicting chromosomal abnormality

Factor XI (FXI) and DUMPS. Out of which, 10 animals were found to be carrier for BLAD.

Of the 543 animals tested for chromosomal abnormalities, one cross-bred (Jersey-*Sahiwal*) male calf was found with numerical chromosomal abnormality, having 59 XXY chromosome.

NABL ACCREDITATION AND REFERRAL FOOD LABORATORY STATUS FOR CALF

Since 2013, the Laboratory has been accredited as per ISO 17025: 2005 by the National Accreditation Board for Testing and Calibration Laboratories (NABL) for chemical and biological testing. During the year, the Laboratory has also expanded the scope of accreditation for genetic analysis like parentage verification and various genetic disorders during the surveillance audit in 2014. Similarly, the scope has been enhanced for fatty acids, cholesterol, vitamins, pesticides and aflatoxins in feed and milk products.

The Food Safety and Standards Authority of India (FSSAI) recognised CALF as a Referral Food Laboratory for analysis of milk and milk products. Bureau of Indian Standards also recognises the Laboratory as a specialised lab under group -2 and the scope of analysis has been enhanced by including additional products.

Screening of bulls for chromosomal abnormalities

OTHER ACTIVITIES

Concerted efforts were made during the year to promote Hindi in the official work.

PROGRESSIVE USE OF HINDI

NDDB's Annual report, Note on Parliamentary Standing Committee on Agriculture, NDP Progress Report, Presentation on NDP to Parliament, Training material and other documents were translated in Hindi. Besides, effective steps were taken to implement the official language policy.

With a view to create awareness among the employees to use Hindi in their day to day official work as well to accelerate the pace of its progressive use, Hindi Fortnight was organised in all NDDB offices during September, 2014. Apart from a lecture by a prominent Hindi Scholar on the eve of Hindi Day, competitions like on-the-spot Hindi Essay writing, Translation, General Knowledge and Poetry recitation were organised during the year. A large number of employees participated in these competitions and winners were awarded cash prizes. Those who could not win cash prize were given English to Hindi dictionary as a token of recognition of their participation.

IN NOVEMBER 2014, NDDB RECEIVED INDIRA GANDHI RAJBHASHA AWARD FOR THE YEAR 2013-14 FROM SHRI PRANAB MUKHERJEE, THE PRESIDENT OF INDIA AT VIGYAN BHAWAN, NEW DELHI

NDDB has introduced various incentive schemes for promotion of Hindi in the office work. One such scheme is Hindi noting and drafting incentive scheme. Twenty eight employees participated in this scheme and were given cash incentive. Besides, 7 employees, whose children scored 75 per cent and more marks in Hindi in Class 10th and 12th standard examination, were given cash prize of ₹ 1,000/- each.

NDDB was actively associated with Town Official Language Implementation Committee (TOLIC) Undertaking, Vadodara. Department of Official Language, Ministry of Home Affairs, New Delhi has now constituted a Town Official Language Implementation Committee in Anand and Bank of Baroda has been given the responsibility for its co-ordination. NDDB has now become a member of TOLIC, Anand and actively participated in its half yearly meeting and other activities. NDDB also organised a workshop on Hindi Noting and Drafting for all TOLIC, Anand members. The response was good with a large number of Central Government, Public Sector Bank, Public Sector Insurance Company officials located in Anand actively participating in the workshop. Besides, NDDB employees from various groups also took part in the workshop.

NDDB received the Indira Gandhi Rajbhasha Award from the President of India for a consecutive three years. Recognising NDDB's commendable efforts in excellent implementation of Hindi in Region B, NDDB received the Indira Gandhi Rajbhasha Award for the year 2012-13 from Shri Pranab Mukherjee, the President of India at Rashtrapati Bhawan on the occasion of Hindi Day on 14 September 2014. In November 2014, NDDB received Indira Gandhi Rajbhasha award for the year 2013-14 from Shri Pranab Mukherjee, the President of India at Vigyan Bhawan, New Delhi.

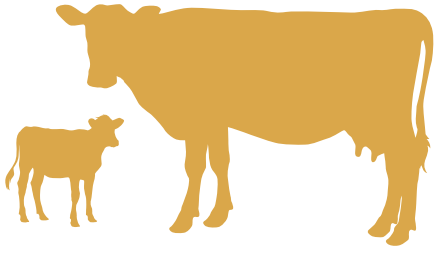
The NDDB library has a good number of Hindi books. During the year, an expenditure of ₹ 44,043/- was incurred on purchase of Hindi books.

All National Programmes viz. Republic Day, Independence Day, Gandhi Jayanti, Shastri Jayanti and Ambedkar Jayanti were organised in Hindi.

WELFARE OF SC/ST EMPLOYEES

Welfare and capacity building measures for SC/ST employees focused on their overall development during the year. Thirty six SC/ST employees were nominated to training/seminars and workshops with the objective of skill development and to update them with recent developments in the field. SC/ST employees were reimbursed expenses incurred on education as well as books for their children. Meritorious children of SC/ST employees were awarded cash prize and certificates for achieving academic proficiency during the year.

Ambedkar Jayanti was celebrated in all offices of NDDB wherein distinguished speakers shared their thoughts on the life and contributions of Dr. Ambedkar.



PLANNED ACTIVITIES FOR 2015-16

Efforts will be made to increase milk procurement of co-operatives by 20 lakh kg per day and women membership by 2.5 lakh.

SUPPORT TO COOPERATIVES

During 2015-16, NDDB will continue to:

(a) to assist dairy cooperatives develop robust governance and management systems

(b) increase involvement of Women in Dairy cooperatives

(c) manage West Assam Milk Union Ltd., Jharkhand Cooperative Milk Federation and Jalgaon Milk Union.

Happy family member of the milk producer

The other activities planned are as follows:

- Preparation of state dairy development plans for Himachal Pradesh, Jharkhand, Meghalaya and Uttarakhand.
- Emphasising Vision 2025 goals in communications/ engagements with dairy cooperatives. Efforts will be made to increase milk procurement of co-operatives by 20 lakh kg per day and women membership by 2.5 lakh.
- Encouraging Milk Unions and Federations to open bank accounts of milk producers under Pradhan Mantri Jan Dhan Yojna. Unions will also be encouraged to increase their efforts towards making milk payments directly to the producer's accounts.
- Participate in Green India Mission initiative of the Government of India by encouraging Dairy Cooperative Societies and their members to plant as many trees as possible.
- Milk Unions will be facilitated in completion of field level VBMPS - NDP-I trainings, which will help in capacity building of milk producers, management committee members, DCS functionaries and employees of the cooperative unions.
- Support to other groups for Quality Mark initiative, development of AMCU software/ERP, producer awareness campaign and other field level activities.

The requests received from dairy cooperative unions and federations would be critically examined and appraised for creation and expansion of milk processing and feed & feed supplement manufacturing facilities with an estimated outlay of about ₹ 4,000 million and proposals for working capital loan of about ₹ 600 million.

Comprehensive study for sustainability of select Milk Unions having potential for expansion improvement in operations will be carried out with a focus to bring about efficiency so as to pass-on maximum share of consumer rupee back to milk producers.

Need assessment would be carried out to identify areas of intervention in animal husbandry and dairy development sector in various states. Consultation would be held with the key stakeholders to arrive at State-specific strategies which are expected to bring in synergy in implementation of various schemes related to AH&D for effective growth of the sector leading to social and economic development of milk producers.

Indigenously developed hand-held milking machine in operation

ANIMAL BREEDING

Technological advancement and availability of sex sorted semen in dairy advanced nations has a great potential to revolutionise Indian dairy industry. Application of this technology could prevent birth of undesirable male calves to a large extent, almost double the availability of female animals for herd replacement and ensure optimal utilisation of scarce feed and fodder sources for milk production. However, since skills and knowledge of AI technicians, handling of semen under field condition, management and nutritional status of dairy animals and the environmental condition in India are quite different compared to dairy advanced nations, it has been planned to import and conduct a pilot study on use of sex sorted semen in a scientific manner by involving select agencies to get first-hand information on the performance of sex sorted semen under field conditions.

Efforts to apply genomics for selection of breeding animals would continue. To arrive at genomic selection equations, it is necessary to genotype large number of animals of Indian breeds of cattle and their crosses. To do this cost effectively, a few hundred DNA samples from different indigenous and cross-bred cattle will be genotyped with High Density Genotyping chips and around 8,000 to 10,000 SNPs which are variable specifically in indigenous and cross-bred cattle will be identified to prepare a custom made genotyping chip suitable for genomic selection of Indian dairy cattle population.

Animal Breeding projects being implemented under NDP-I are generating large amount of performance records of various breeds of dairy animals. To enhance and enrich the project learning, collaborative research with universities and national level institutions would be undertaken by allowing PG and PhD students to carry out applied research projects.

To take advantage of progress made by the dairy advanced nations, it has been planned to import embryos for production of exotic bulls required in future and also import live bulls to meet the immediate requirement of semen of Holstein and Jersey breeds of exotic cattle for crossbreeding to enhance the genetic potential of the large number of nondescript cattle available in the country.

For effective and efficient management of frozen semen production stations and to collate the data from all semen stations in the country, an Information Network for Semen Production and Resource Management (INSPRM) is being developed by NDDB and the same would be made available during the year to semen stations being strengthened across the country under NDP-I.

Further, Training of Trainers (TOT) programme would be taken up on large scale to expand the use of Information Network for Animal Productivity and Health (INAPH) by various agencies involved in Animal Husbandry and Dairying in the country.

ANIMAL NUTRITION

Ration balancing advisory services will be implemented in 38 new EIAs in different states. Progress monitoring support, EPM, procurement MIS data entry and follow up with EIAs for project fund utilisation and procurement along with FUC submission and certification will be provided to 75 EIAs covered under NDP-I. Technical officers and trainers from different EIAs would be trained on different aspects of animal feeding and ration balancing software handling and necessary support will also be provided for LRP training at EIA level.

Fodder development programmes would be implemented in 49 EIAs and necessary technical support on procurement of mowers, establishment of seed processing plants and training on fodder production and conservation will be continued. Ten new Micro-Training Centres will be established. Collaborative project with Anand Agricultural University on standardisation of micro-propagation technology (tissue culture) in thorn-less cactus (*Opuntia*) would be continued.

A study on lactating animals will be conducted to assess the impact of feeding a balanced ration prepared using green fodder, on milk production, feed conversion efficiency, rumen microbial protein synthesis, immunity, parasitic infestation and enteric methane emissions; under field conditions. Impact of feeding a balanced ration on carbon footprint of milk production from cradle-to-farm gate, will be calculated.

Under the calf rearing programme, data on package of practices for rearing female buffalo calves and indigenous cow calves under field conditions would be generated. milk producers may be advised to feed optimally to buffaloes and indigenous cows in advanced stage of pregnancy. Subsequently, thus healthy born calves if fed on scientific lines would grow at a desired rate and attain early maturity.

Impact of balanced ration on Solids-Not-Fat (SNF) content of milk in cross-bred cows will be studied in the states of Gujarat and Kerala. Effect of feeding toxin binder on excretion level of aflatoxin B_1 from feed to milk as M_1 would be studied in lactating cows under field conditions.

Technical support would be provided for setting up bypass protein, mineral mixture and bypass fat plants for cattle feed plants under dairy cooperatives. Necessary assistance would also be provided to different EIAs for development of extension material in local languages.

ANIMAL HEALTH

During 2015-16, NDDB will continue to support pilot projects on brucella and mastitis control and, carry on its efforts to, improve biosecurity in bull production areas and semen stations, increase general awareness on animal health issues and, promote the Animal Health module of INAPH software.

RESEARCH AND DEVELOPMENT

NDDB's R&D Laboratory has installed robotic samples processing system for providing rapid and accurate diagnosis for the animal diseases on a large number of specimens. This laboratory also proposes to offer diagnostic services with improved techniques for additional diseases to more number of stakeholders. Work has been initiated to optimise newer as well as point of care diagnostic tests.

INFORMATION NETWORK

During the year 2015-16, a study to estimate quantity and value of feed and fodder consumed by bovine in Gujarat, entrusted by the Directorate of Economics & Statistics (DES), Government of Gujarat, will be completed. The second round (lean season) of this study is due in 2015 and based on the data collected in these two rounds, the estimates of the value and quantity of feed and fodder consumed by bovine in the state will be generated. The same will be used for estimating agriculture GDP of the state in a more refined way. The study covers 57 sample villages from19 representative talukas. The details information on feed & fodder intake of all animals are collected from 1,400 milk producers following actual measurement method.

A mid-term evaluation of the External Monitoring & Evaluation for NDP-I is due in 2015-16. This is a comprehensive round of the series of study spanned over a period of seven years, beginning 2012-13. The outcome of the survey will be compared with the baseline project indicators to monitor the progress of NDP-I.

During 2015-16, software modifications in the present Internet based Dairy Information System (i-DIS) with a view to make it more comprehensive and user friendly would be completed.

Internet based Dairy Geographical Information System (i-DGIS) is a strong visualisation tool developed by NDDB, which enables identification of villages on a digital internet based platform and also integrates human census, livestock census & land cover of villages, in all the major milk producing states of India. i-DGIS is planned for introduction in the co-operative dairy sector of 10 major milk producing states viz. Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu and West Bengal. Efforts would be made to identify and map the villages covered by the co-operative dairy sector on i-DGIS for convergence in planning of activities by various stakeholders.

During 2015-16, NDDB would continue providing dairy analyses for four major milk producing states- Maharashtra, Odisha, Rajasthan and Uttar Pradesh.

ENGINEERING PROJECTS

During 2015-16, 8 projects are scheduled to be completed. They include: a) four Dairy Plants at Bharuch, Mohali, Tumkur PH II and Hotwar b) two Product Plants at Ambattur and Banglore c) one Bypass Protein and Mineral Mix plant at Hotwar d) one Cattle Feed Plant at Kaladera.

The Cheese and Whey Powder plant under execution at Banas shall be partly completed with commissioning of Cheddar Cheese and Whey Powder Plant. The

mozzarella and processed cheese sections shall be commissioned in early 2016-17.

NATIONAL DAIRY PLAN

During 2015-16, 40 new sub-projects are expected to be approved with an estimated outlay of ₹ 3,000 million.

Monitoring, evaluation and reporting of the progress made by the sub-projects approved under NDP-I would be the key focus area during the year. Monitoring of the approved sub-projects would be done through ICT based Management Information System and regular field visits.

12 Regional Review Meetings would be organised during the year to review the progress of sub-projects with End Implementing Agencies. External monitoring and evaluation of NDP-I and special studies on women empowerment, impacts of ration balancing programme and methane emission measurement would be undertaken.

Physical progress and fund utilisation of all the sub-projects would be monitored, analysed and reported. Internal and external audit of NDP-I accounts would also be coordinated.

AWARENESS GENERATION AND COMMUNICATION

NDDB plans to partner with DD Kisan channel to create meaningful content for the farm and dairy sector. This partnership would take the dairy and farm sector to new heights for dissemination of up-to-date technical know-hows to the farmers; improve their livelihood and income by enhancing their knowledge and information on various technical issues related to farming in broader sense. The content will be based on ground realities, actual problems and issues faced by the farmers.

NDDB would provide knowledge, information and facilitation support.

NDDB will take up the Green Initiative during 2015-16. Climate change is something the economy of the nation, its villages and its farmers cannot remain immune to. Water and fodder resources of the country are being seriously impacted by the loss of green cover. Dairy farmers have significant economic interests in promoting planting of trees and maintaining fodder resources in private and common lands. NDDB will request all 1,65,835 village dairy cooperatives and 198 dairy cooperatives unions to encourage their members to actively participate in this movement and plant as many trees as possible. This will greatly contribute towards our livelihood and the welfare of our dairy animals.

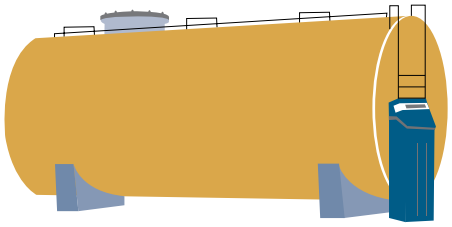
1,65,835 VILLAGE DAIRY COOPERATIVES AND 198 DAIRY COOPERATIVES UNIONS TO ENCOURAGE THEIR MEMBERS TO ACTIVELY PARTICIPATE IN THIS MOVEMENT AND PLANT AS MANY TREES AS POSSIBLE

SUBSIDIARIES

IDMC offers processing and packaging solutions to make food safe.

IDMC LIMITED

During 2014-15, IDMC completed the supply, installation, testing and commissioning of six dairy projects with capacities ranging from two to six lakh litres per day and two dairy plants with capacities to manufacture multiple products such as *paneer*, flavoured milk, yoghurt and sterilised milk. IDMC completed the export of a syrup processing line with a capacity of 10 KLPH. A fully automatic spray drying milk powder plant with a capacity of 20 tonnes per day was also commissioned.



Prototype mobile bulk milk cooler

During the year, IDMC successfully executed the processing section of Asia's largest Foot and Mouth Vaccine (FMDV) manufacturing facility. The Company also initiated the execution of two project orders for setting up clean and general utilities for a Bio Safety Laboratory (BSL 3+), which will form part of an International Centre for FMD Vaccine. In addition, the Company was close to completing a project for downstream processing equipment for a Monoclonal Anti Body (MAB) facility.

IDMC successfully supplied and commissioned three glycol based ammonia refrigeration packages with an aggregate capacity of 750 TR to a dairy plant. The Company received a repeat order for three more such packages. IDMC also commissioned and handed over an ammonia refrigeration system to another customer. During the year, IDMC commissioned eleven refrigeration projects.

IDMC completed and handed over two cattle feed expansion projects (from 150 MTPD to 300 MTPD). A green field 100 TPD Cattle Feed Project was under execution. IDMC is executing this green field project on a turnkey basis, which includes civil works.

IDMC continued to have a major share of the market for Bulk Milk Coolers (BMCs) in India and satisfactorily executed service agreements with key customers. The Company also exported BMC modules.

IDMC completed the supply of large plate heat exchangers to two mega projects of a global EPC company and also to a *Navratna* company.

IDMC's HACCP certified plant continued to manufacture and market poly films and laminates for packing liquid milk, edible olis and other food products.

In the year to follow, stakeholders are likely to significantly increase their investment in the dairy sector for milking machines, bulk milk coolers and dairy processing infrastructure. In addition, the plastic packaging industry is projected to continue growing at around 15 per cent per annum. Based on these trends, IDMC will be focusing on offering reliable and affordable technologies at the doorstep of the milk producer, such as scientifically designed and cost effective milking machines, backed by prompt after sales service.

In FY 2014-15, IDMC reported a total income of ₹ 3,806 million with a profit before tax of ₹ 40.3 million.

INDIAN IMMUNOLOGICALS LTD

Indian Immunologicals Ltd (IIL) continues to lead the domestic animal vaccines market as the largest player; and the animal health market as a top three player. IIL's Foot and Mouth Disease (FMD) vaccine - Raksha Ovac, continues to be the largest selling veterinary brand in India with sales of ₹ 1,550 million. Other animal vaccines recorded sales of ₹ 480 million. IIL's flagship human rabies vaccine 'Abhayrab' recorded sales of ₹ 1,370 million. Other human vaccines catering to the requirements of the Ministry of Health's Universal Immunisation Programme (UIP) recorded cumulative sales of ₹ 620 million.

The cattle feed plant at Rajkot, which was a sick unit of the Gujarat Dairy Development Corporation (GDDC) acquired by NDDB as part of a BIFR rehabilitation scheme and now managed by IIL, witnessed a profitable turn around on sales revenues of ₹ 290 million. IIL has plans to enlarge its product portfolio to manufacture both animal feed and nutraceutical products in order to make its profitability more sustainable.

IIL increased its FMD vaccine manufacturing capacities from 240 million to 360 million trivalent doses per annum, making it the largest producer of FMD vaccine in the world.

During the year, IIL launched Raksha-Blu (Blue tongue virus vaccine) in the animal health market and a new range of preventive wellness products – Vivagut (Probiotics) and Vivafit (Antioxidants) in the human health market.

IIL is focusing its research efforts on developing a modified live CPV2b vaccine for canine parvovirus, recombinant porcine cysticercosis vaccine, gE deleted IBR marker vaccine and a multicomponent clostridial vaccine. In human vaccines, IIL is working on an inactivated hepatitis A vaccine, chikungunya vaccine, rabies therapeutic monoclonal antibodies and salmonella vectored human papillomavirus (HPV) oral vaccine.

As part of its Corporate Social Responsibility initiatives, IIL implemented Project "Gou Raksha" to provide health coverage to destitute cattle in Goushalas and

Interior of Foot & Mouth Disease vaccine plant

Panjarapoles; and Project "Abhay Shakti", to provide iron supplements, free of cost, to adolescent school girls suffering from anaemia. The focus of these two projects is in the eastern states of India, where the problem is more acute.

IIL's new manufacturing facility in Karkapatla to manufacture animal health formulations has commenced commercial production. Its new facility for human rabies vaccine will go into commercial production during the financial year 2015-16. It is also planned to commission an ampoule filling and a prefilled syringes facility in Karkapatla during 2015-16.

Bovine Serum is one of the critical imported raw materials used in the production of vaccines. IIL is setting up a bovine serum manufacturing facility in New Zealand, through its wholly owned subsidiary - Pristine Biologicals (NZ) Limited, with an investment of ₹ 60 million.

IIL also plans to launch small animal feed 'labmeal' and 7 in 1 vaccine for canines during 2015-16.

The Company registered sales revenues turnover of ₹ 4,828 million with net profit of ₹ 404 million during the year.

MOTHER DAIRY FRUIT AND VEGETABLE PRIVATE LIMITED

Mother Dairy Fruit and Vegetable Private Limited's (MDFVPL) business segments include liquid milk, dairy products, edible oils and horticulture. The liquid milk business includes Bulk Vended Milk (BVM) and Poly Pack Milk (PPM). While sales of PPM in the National Capital Region (NCR) and other markets increased by five per cent over the previous year, sales of BVM (mainly sold in NCR) were almost at par with previous year due to high availability of loose milk in the market and the increasing customers preference for convenience in having milk delivered at home. MDFVPL has launched Mobile Milk Vans (*Kamdhenu*) and Automatic Vending Machines (AVMs) to offer convenience of milk buying at doorstep to the consumer. It is in the trial stage at present and shall be scaled up during the coming Financial Year. MDFVPL strengthened its position in the business of dairy products with sales growing by 16 per cent in 2014-15, to about ₹ 8,872.3 million. Sales of edible oils and horticulture remained subdued mainly due to pressure on prices of the commodities. Focus continued to be put on quality of fruit as a strategy to drive growth in the fresh fruit & vegetables category. A new state-of-the-art Dairy Products factory with a capacity to handle three LKGPD milk has been established at Etawah, Uttar Pradesh. With this, MDFVPL has plans to enter the ambient dairy product range including Dairy Whitener, UHT Cream, and UHT Beverages in Tetra pack (Milk Shakes, *Lassi*, Flavoured Milk, Butter Milk) to secure the growing needs of convenience. The Company is also planning to test pilot the launch of Pulses in the consumer packs under "Safal" brand. Mother Dairy assisted the West Bengal Government in setting up a fresh fruits & vegetables retail sales operations in Kolkata.

Based on the encouraging response from consumers, MDFVPL plans to scale up the newly introduced Automatic Vending Machines (AVM) for dispensing liquid milk in Mumbai as well as in Delhi. Mother Dairy

Ice cream filling machine

will target condominiums for people seeking convenience as well as assurance on quality of milk and also cover localities inhabited by the economically marginal citizens with rightly priced affordable milk. Plan is also afoot to expand the fleet of "*Kamdhenu*" (mobile milk vending vehicles) to access the hitherto untapped markets. The Company will be tapping into new business opportunity with long shelf life ambient dairy products such as Dairy Whitener, UHT cream & beverages across India with a special focus on distant geographies like North hills, Eastern and North Eastern India. Project work shall be initiated for setting up a large Dairy Plant in Maharashtra to support the expansion plans in the Western India. MDFVPL is also launching Pulses in "Safal" brand, sales of which shall be aggressively driven both in own stores as well as general trade. To support the double digit growth in sales of Frozen Fruits & Vegetables and Fruit Pulps & Concentrates, it is planned to expand sourcing and processing by setting up operations in the State of Jharkhand. This on one hand would help in tapping the huge potential available in the State and on the other hand shall fulfill the objective of providing remunerative prices for the agricultural produce and direct/ indirect employment to the farmers in the State.

The Company achieved a total sales turnover of about ₹ 69,303.2 million during 2014-15 registering a growth of nine per cent as compared to the previous year.

NDDB DAIRY SERVICES

NDDB Dairy Services (NDS) was incorporated in 2009 as a not for profit company under section 25 of Companies Act, 1956, to function as a delivery arm of NDDB for field operations relating to promoting producer organisations and productivity services.

During 2014-15, NDS facilitated incorporation of three Milk Producer Companies (MPCs) viz. Shreeja Mahila Milk Producer Company in Andhra Pradesh, Baani Milk Producer Company in Punjab and Saahaj Milk Producer Company in Uttar Pradesh.

NDS has also provided technical support to Paayas MPC in Rajasthan and Maahi MPC in Gujarat in taking up various activities under National Dairy Plan.

During the year, NDS conducted a three day "Policy Governance Workshop" for the Board of Directors of Paayas and Maahi MPCs. The participants were taken through the concept of 'Policy Governance' emphasising its rationale, importance and utility.

NDS had also trained personnel of outsourced agencies engaged by the Milk Producer Companies for taking up various awareness programmes. A two day programme on 'Leadership Development' was designed and facilitated by NDS for the potential VCG and MRG members of the MPCs.

NDS has initiated a Model Farm pilot project for setting up model dairy farms with the producer members of Shreeja MMPC. The improved farm management practices in areas of calf and heifer care, preventive health care, reproductive care, housing improvement, soil improvement, farm book-keeping, fodder production and preservation etc. are being adopted in these model farms which would then become examples and learning centres for other farms in the vicinity. This model is planned to be replicated in other MPCs.

The two existing semen stations managed by NDS- SAG, Bidaj and ABC, Salon together produced over 22 million frozen semen doses (FSD) during 2014-15. During the year 2015-16, NDS would assist milk producers in setting up new Producer Companies. NDS shall continue to support the five Producer Companies for activities related to Institution Building, Animal Breeding, Nutrition and Ration Balancing advisory services. NDS shall also monitor and assist Producer Companies in achieving physical and financial parameters under the NDP.

NDS is establishing semen stations at Rahuri in Maharashtra and Alamadhi in Tamil Nadu. It is expected that these two Semen Stations would be operationalised and the semen production would commence during the year 2015-16.

DAIRY COOPERATIVES AT A GLANCE

DAIRY COOPERATIVE SOCIETIES

(in numbers)+

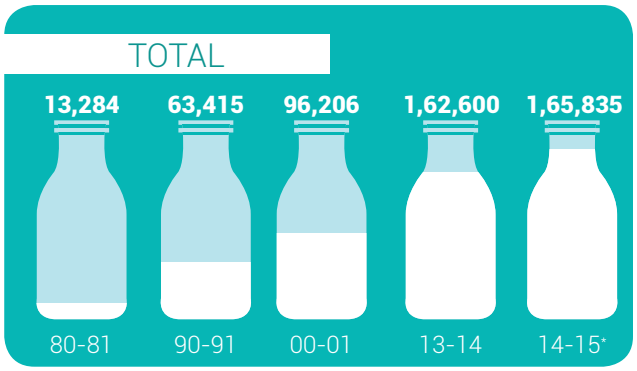
NORTH	80-81	90-91	00-01	13-14	14-15*
Haryana	505	3,229	3,318	7,092	7,035
Himachal Pradesh		210	288	813	845
Jammu & Kashmir		105	**	**	326
Punjab	490	5,726	6,823	7,541	7,411
Rajasthan^	1,433	4,976	5,900	16,953	14,618
Uttarakhand					2,393
Uttar Pradesh	248	7,880	15,648	23,378	22,674

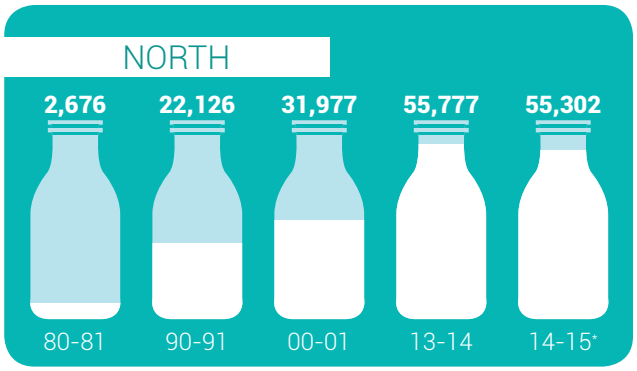
EAST	80-81	90-91	00-01	13-14	14-15*
Assam		117	125	249	294
Bihar	118	2,060	3,525	15,653	17,718
Jharkhand				58	60
Meghalaya					66
Mizoram					37
Nagaland		21	74	51	51
Odisha		736	1,412	5,219	5,348
Sikkim		134	174	357	389
Tripura		73	84	92	98
West Bengal	584	1,223	1,719	3,284	3,487

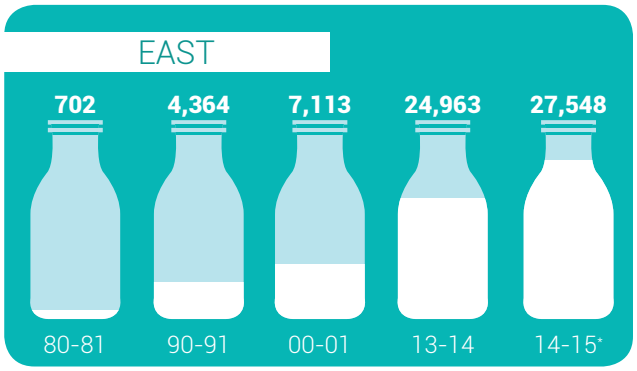
WEST	80-81	90-91	00-01	13-14	14-15*
Chhattisgarh				1,024	766
Goa		124	166	180	180
Gujarat	4,798	10,056	10,679	17,325	18,536
Madhya Pradesh	441	3,865	4,877	7,491	8,024
Maharashtra	718	4,535	16,724	21,541	21,082

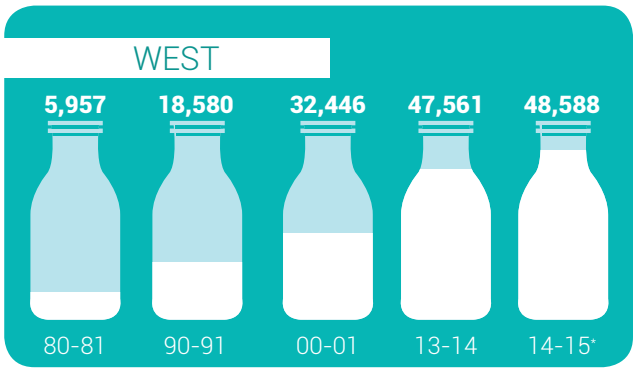
SOUTH	80-81	90-91	00-01	13-14	14-15*
Andhra Pradesh	298	4,766	4,912	5,593	3,425
Karnataka	1,267	5,621	8,516	13,772	14,377
Kerala		1,016	2,781	3,789	3,836
Tamil Nadu	2,384	6,871	8,369	11,043	10,997
Telangana					1,660
Puducherry		71	92	102	102

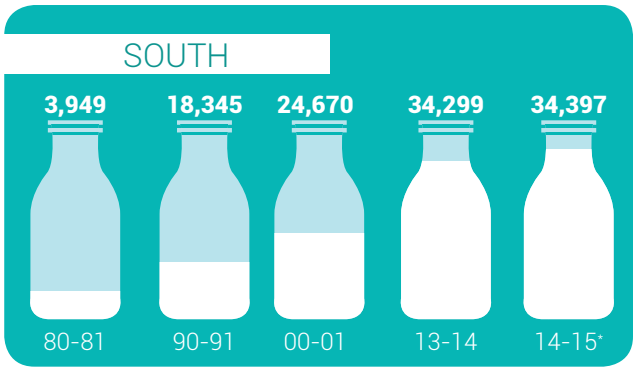
+ Organised (cumulative), includes conventional societies and Taluka unions formed earlier
** Not reported * Provisional
^ DCS included registered and collection centers proposed for registration and their membership during 2009-10 to 2013-14.
Meghalaya, Mizoram, Telangana and Uttrakhand states are included from 2014-15.











PRODUCER MEMBERS
(in thousands)

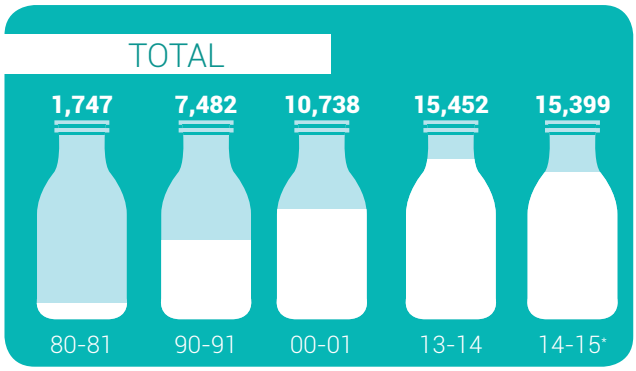
NORTH	80-81	90-91	00-01	13-14	14-15*
Haryana	39	184	185	318	297
Himachal Pradesh		17	20	35	35
Jammu & Kashmir		2	**	**	6
Punjab	26	304	370	411	394
Rajasthan^	80	340	436	703	731
Uttarakhand					103
Uttar Pradesh	18	392	649	955	877

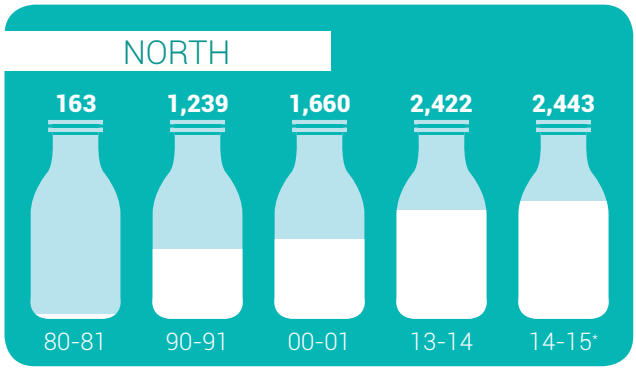
EAST	80-81	90-91	00-01	13-14	14-15*
Assam		2	1	10	12
Bihar	3	100	184	842	920
Jharkhand				1	1
Meghalaya					4
Mizoram					1
Nagaland		1	3	2	2
Odisha		46	111	266	271
Sikkim		4	5	10	10
Tripura		4	4	6	6
West Bengal	20	66	114	227	242

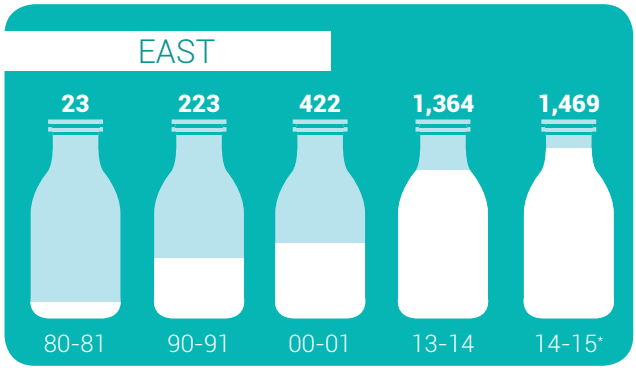
WEST	80-81	90-91	00-01	13-14	14-15*
Chhattisgarh				41	32
Goa		12	18	19	19
Gujarat	741	1,612	2,147	3,234	3,365
Madhya Pradesh	24	150	242	286	311
Maharashtra	87	840	1,398	1,793	1,770

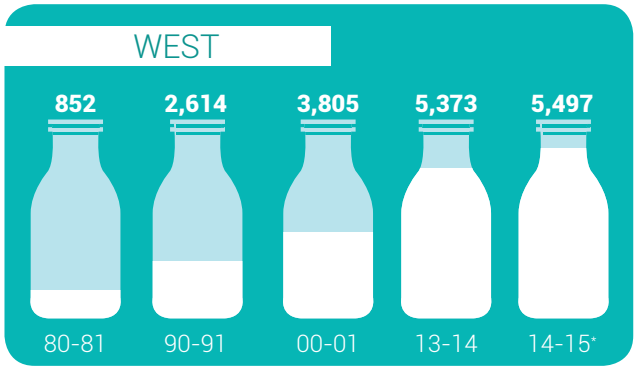
SOUTH	80-81	90-91	00-01	13-14	14-15*
Andhra Pradesh	33	561	702	858	637
Karnataka	195	1,013	1,528	2,297	2,359
Kerala		225	637	898	919
Tamil Nadu	481	1,590	1,957	2,202	1,922
Telangana					115
Puducherry		17	27	38	38

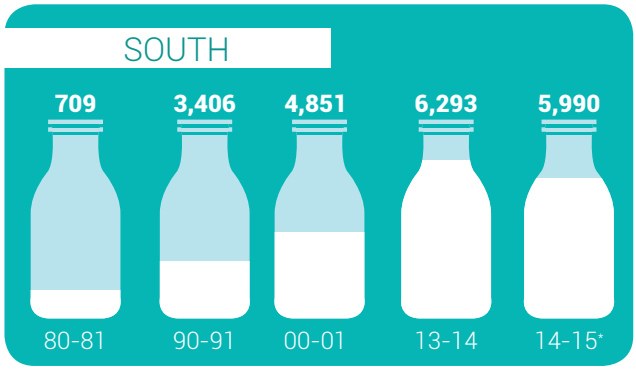
** Not reported * Provisional
^ DCS included registered and collection centers proposed for registration and their membership during 2009-10 to 2013-14.
Meghalaya, Mizoram, Telangana and Uttrakhand states are included from 2014-15.











MILK PROCUREMENT

(in thousands kilograms per day)#

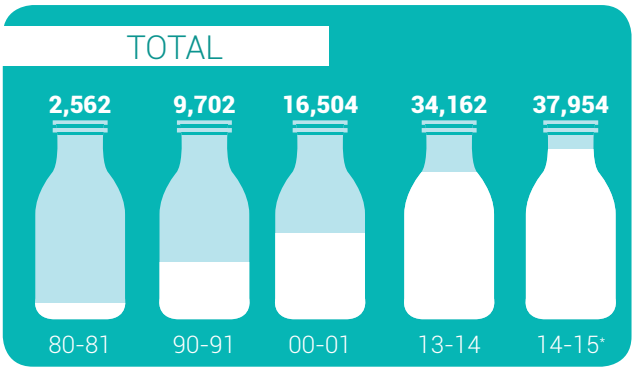
NORTH	80-81	90-91	00-01	13-14	14-15*
Haryana	33	94	276	398	437
Himachal Pradesh		14	24	60	55
Jammu & Kashmir		11	**	**	13
Punjab	75	394	912	1,152	1,279
Rajasthan	138	364	887	2,245	2,535
Uttarakhand					139
Uttar Pradesh	64	382	791	373	404

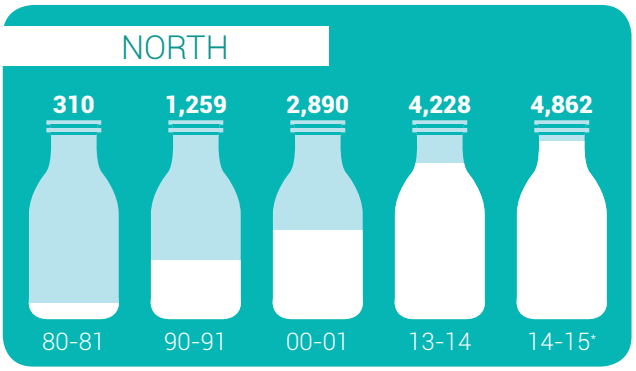
EAST	80-81	90-91	00-01	13-14	14-15*
Assam		4	3	23	23
Bihar	3	95	330	1,485	1,676
Jharkhand				9	14
Meghalaya					10
Mizoram					7
Nagaland		1	3	2	2
Odisha		41	94	390	440
Sikkim		4	7	15	17
Tripura		3	1	4	5
West Bengal	31	52	204	161	156

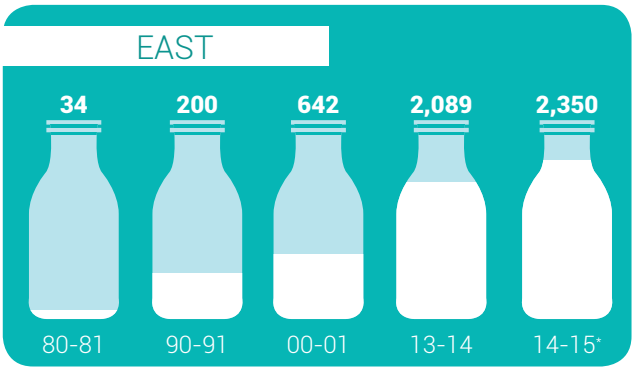
WEST	80-81	90-91	00-01	13-14	14-15*
Chhattisgarh				43	52
Goa		16	32	63	65
Gujarat	1,344	3,102	4,567	13,556	15,295
Madhya Pradesh	68	256	319	825	1,103
Maharashtra	165	1,872	2,979	3,083	3,243

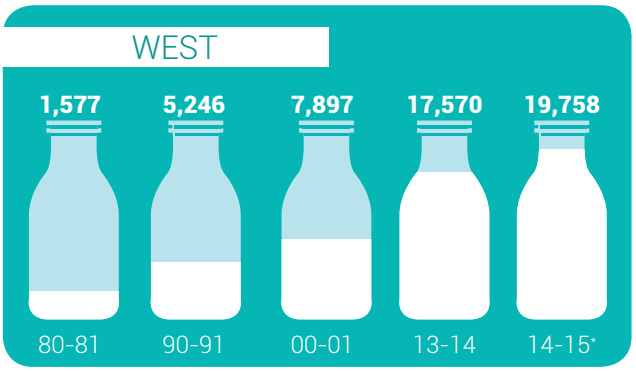
SOUTH	80-81	90-91	00-01	13-14	14-15*
Andhra Pradesh	79	763	879	1,730	1,221
Karnataka	261	917	1,887	5,161	5,861
Kerala		185	646	963	1,018
Tamil Nadu	301	1,106	1,618	2,385	2,435
Telangana					423
Puducherry		26	45	36	26

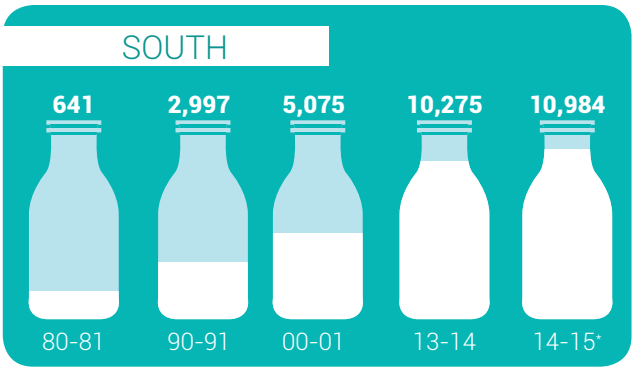
** Not reported * Provisional # Includes outside state operations.
Meghalaya, Mizoram, Telangana and Uttrakhand states are included from 2014-15.
Gujarat's total procurement in 2014-15 includes 2,078 TKPD from outside the state.
In 2013-14, the corresponding figure was 1,426 TKPD.











LIQUID MILK MARKETING

(in thousands litres per day)+

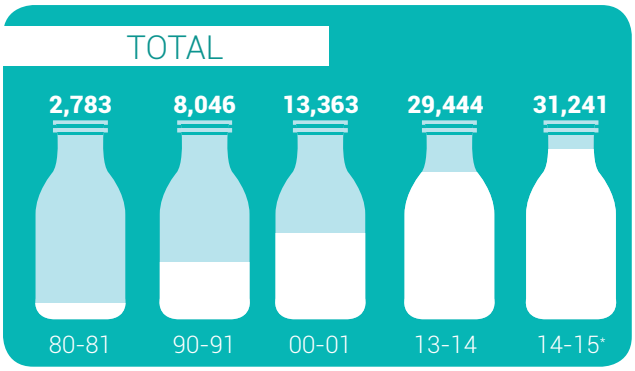
NORTH	80-81	90-91	00-01	13-14	14-15*
Haryana	2	80	108	371	368
Himachal Pradesh		15	20	19	18
Jammu & Kashmir		9	**	**	13
Punjab	7	139	420	927	944
Rajasthan	12	136	540	1,880	2,005
Uttarakhand					130
Uttar Pradesh	1	326	436	631	592
Delhi	697	1,051	1,524	5,487	5,885

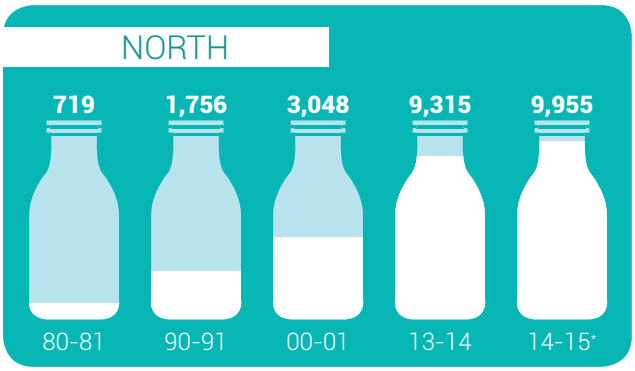
EAST	80-81	90-91	00-01	13-14	14-15*
Assam		10	7	38	40
Bihar	8	111	324	707	840
Jharkhand				306	308
Meghalaya					10
Mizoram					6
Nagaland		1	4	3	3
Odisha		65	98	459	474
Sikkim		5	7	27	28
Tripura		6	7	11	10
West Bengal	17	26	27	42	32
Kolkata	283	526	840	1,162	1,148

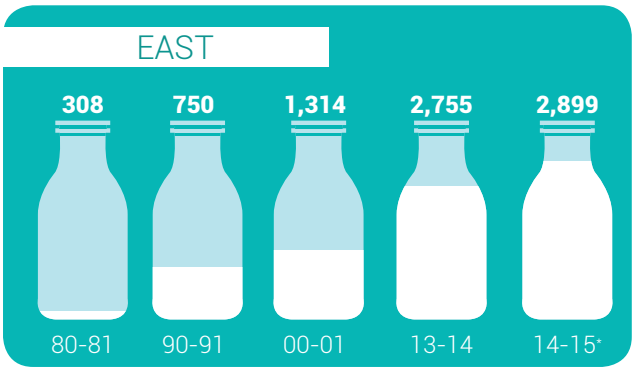
WEST	80-81	90-91	00-01	13-14	14-15*
Chhattisgarh				108	132
Goa		36	83	71	79
Gujarat	210	1,052	1,905	4,200	4,468
Madhya Pradesh	39	279	244	734	800
Maharashtra	18	363	1,178	2,440	2,574
Mumbai	950	1,057	1,390	1,696	1,785

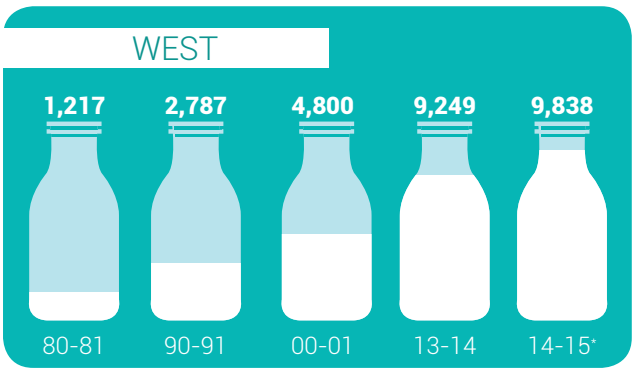
SOUTH	80-81	90-91	00-01	13-14	14-15*
Andhra Pradesh	19	552	733	1,719	1,121
Karnataka	166	889	1,501	2,998	3,219
Kerala		223	640	1,189	1,232
Tamil Nadu	109	405	559	1,018	1,023
Telangana					736
Puducherry		22	43	106	105
Chennai	245	662	725	1,095	1,113

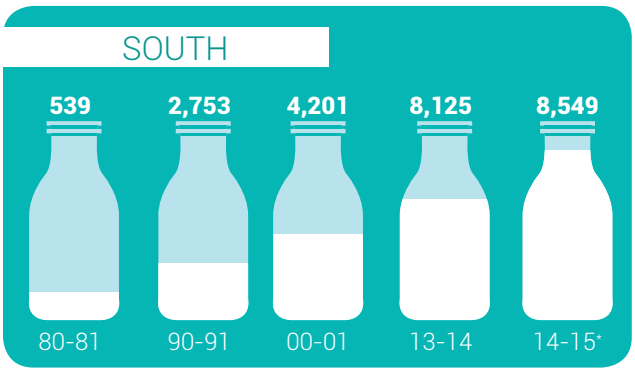
** Not reported + Includes Metro Dairies and outside state operations.
* Provisional
Meghalaya, Mizoram, Telangana and Uttrakhand states are included from 2014-15.
Gujarat's total marketing of milk including outside the state in 2014-15 stands at 9,932 TLPD.
In 2013-14, the corresponding figure was 8,886 TLPD.











VISITORS

DURING 2014-15 NDDB RECEIVED 1,687 VISITORS FROM INDIA AND ABROAD.

Overseas visitors came from Afghanistan, Australia, Bangladesh, Bhutan, China, Indonesia, Italy, Japan, Kenya, Malawi, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, South Africa, Sri lanka, Thailand, The United States of America and Vietnam.

Shri KC Joseph, Hon'ble Minister for Culture, Planning & Dairying, Govt of Kerala
Shri KP Mohanan, Hon'ble Minister for Agriculture & AH, GOK accompanied by Shri Subrata Biswas, APC & Principal Secretary, AH&DD and Shri PT Gopalakurup, Chairman, Kerala Cooperative Milk Marketing Federation Ltd

Senator Richard Colbeck, Parliamentary Secretary to the Australian Federal Minister for Agriculture, Mr. Mark Morley Senior Trade Commissioner, Australian Trade Commission and Ms Slava Zeman, Agriculture Counsellor, Department of Agriculture, Government of Australia accompanied by 22 member delegation.

Shri Azim Premji, Chairman, WIPRO

Shri Ashok Kumar Angurana, Secretary, Department of Animal Husbandry, Dairying & Fisheries (AHD&F), Ministry of Agriculture, Government of India, New Delhi

Shri Bhim Singh, Minister, Bihar

Mr. Richard Kiprono Tuwei, Chairman, Kenya Dairy Farmer Foundation (KDFF), Accompanied by Mr. Richard Soy, Secretary General KDFF & Mr. David Kipkorir Bet, CEO, KDFF and Five member delegation

More than 50 per cent of milk produced in the country is from buffaloes

ACCOUNTS

Deloitte Haskins and Sells LLP
Chartered Accountants
Indiabulls Finance Centre, Tower 3, 27th - 32nd Floor,
Senapati Bapat Marg, Elphinstone Road (West),
Mumbai - 400013. Maharashtra. India.
Tel. +91 (022) 6185 4000 / Fax. +91 (022) 6185 4501 / 4601

Independent Auditors' Report

To The Board of Directors of National Dairy Development Board

Report on the Financial Statements

We have audited the accompanying financial statements of **National Dairy Development Board** ("the Board") which comprise the Balance Sheet as at 31st March, 2015, the Income and Expenditure Account and also the Cash Flow Statement for the year then ended, and a summary of Significant Accounting Policies and Notes to Accounts.

Management's responsibility for the Financial Statements

The Board's Directors and Management is responsible for the preparation of these financial statements in accordance with the National Dairy Development Board Act, 1987 ("the Act"). This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and fair presentation of the financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements, based on our audit. We conducted our audit in accordance with Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with the ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risks assessments, the auditor considers the internal controls relevant to the Board's preparation and fair presentation of the financial statements 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. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements of the Board for the year ended 31st March, 2015 are prepared, in all material respects, in accordance with the provisions of the Act.

For Deloitte Haskins and Sells LLP
Chartered Accountants
Firm's Registration No. 117366W/W-100018

Kalpesh J. Mehta
Partner
Membership No. 048791

Place: Anand
Date: July 8th, 2015

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, 2015

₹ in million

	Annexure	31.03.2015	31.03.2014
LIABILITIES			
NDDB Funds	I	26,887.73	26,153.42
Secured Loans	II	13.89	540.90
Current Liabilities and Provisions	III	7,101.17	6,690.35
Total		**34,002.79**	**33,384.67**
ASSETS			
Cash and Bank Balances	IV	7,772.71	9,391.79
Inventories	V	1.40	1.60
Sundry Debtors		14.17	20.39
Loans, Advances and Other Current Assets	VI	16,442.61	14,289.28
Investments	VII	7,679.32	7,528.98
Fixed Assets	VIII	1,902.28	1,948.16
Deferred Tax Assets	XVII (Note 9 and 10)	190.30	204.47
Total		**34,002.79**	**33,384.67**
Significant Accounting Policies	XVI		
Notes to Accounts forming part of Financial Statements	XVII		

In terms of our report of even date attached.

For Deloitte Haskins & Sells LLP
Chartered Accountants

Kalpesh J. Mehta
Partner
Membership No. 048791
Firm Reg. No. 117366W/W-100018

Anand, 8th July, 2015

For and on behalf of the Board,

T Nanda Kumar	**Dilip Rath**	**Y Y Patil**
Chairman	Managing Director	General Manager (Accounts)

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

Income and Expenditure Account
for the year ended 31st March, 2015

₹ in million

PARTICULARS	Annexure	2014-2015	2013-2014
INCOME			
Interest		1,927.93	1,694.82
Service Charges	IX	120.15	70.67
Sales		-	4,252.54
Rent		161.97	150.22
Dividend		24.43	163.50
Other Income	X	27.34	488.58
Total (A)		**2,261.82**	**6,820.33**
EXPENDITURE			
Interest and Financial Charges		148.71	131.02
Remuneration and Benefits to Employees	XI	642.98	471.53
Cost of Materials Sold	XII	-	4,090.94
Administrative Expenses	XIII	157.18	135.77
Grants		7.92	31.17
Research and Development		104.32	86.67
Maintenance of Assets	XIV	191.46	144.90
Other Expenses	XV	59.02	71.71
Bad Debts Written off		-	422.49
Depreciation	VIII	200.31	256.63
Total (B)		**1,511.90**	**5,842.83**
Surplus during the year before tax (C) = (A - B)		**749.92**	**977.50**
Less: Provision for Taxation			
Deferred Tax		14.17	7.38
Wealth Tax		1.08	0.80
Surplus during the year after tax		**734.67**	**969.32**
Less: Appropriations to :-			
Special Reserve		120.47	90.30
Balance carried to General Funds		614.20	879.02
Total (D) = (B + C)		**2,261.82**	**6,820.33**
Significant Accounting Policies	XVI		
Notes to Accounts forming part of Financial Statements	XVII		

In terms of our report of even date attached.

For Deloitte Haskins & Sells LLP
Chartered Accountants

Kalpesh J. Mehta
Partner
Membership No. 048791
Firm Reg. No. 117366W/W-100018

For and on behalf of the Board,

T Nanda Kumar	Dilip Rath	Y Y Patil
Chairman	Managing Director	General Manager (Accounts)

Anand, 8th July, 2015

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

Cash Flow Statement
for the year ended on 31st March, 2015

₹ in million

PARTICULARS	Annexure		2014-15	2013-14
Surplus during the year before tax			**749.92**	**977.50**
Adjustments for :				
Depreciation		200.31		256.63
(Write back)/Provision for inventory obsolescence		(25.59)		(0.42)
(Profit)/Loss on sale of investments		4.61		10.81
Interest income on fixed deposit and bonds considered separately		(1,038.48)		(1,019.24)
Dividend Income considered separately		(24.43)		(163.50)
(Profit)/Loss on sale of fixed assets considered separately		(1.22)		(3.10)
Employee Retirement Benefit		129.68		32.20
Excess Provision of Non-Performing Assets (NPA) written back		-		(456.79)
Interest and financial charges to banks		(1.90)		(4.04)
Bad debts written off		-		422.49
			(757.02)	(924.96)
Operating Cash flow before changes in working capital			**(7.10)**	**52.54**
(Increase)/ Decrease in Inventories		25.79		4,023.28
Decrease/(Increase) in Sundry Debtors		6.22		222.78
Decrease/(Increase) in Loans and Advances		(2,151.55)		(1,570.27)
Tax refunded/(paid)		(122.57)		(112.94)
Increase/(Decrease) in current liabilities		358.03		100.56
			(1,884.08)	2,663.41
Net cash flow generated/(used) in operating activities (A)			**(1,891.18)**	**2,715.95**
Investing activities				
Interest Income		1,081.30		745.30
Dividend Income		24.43		163.50
Proceeds from maturity of investments (Bonds)		545.39		1,139.77
Purchase of Investments (Bonds)		(700.34)		(1,297.42)
Decrease / (Increase) in FDR's with banks more than 90 days (net)		1,650.65		(2,983.77)
Proceeds from sale of fixed assets		43.64		92.29
Purchase of fixed assets		(197.21)		(162.26)
Net cash flow generated / (used) in investing activities (B)			**2,447.86**	**(2,302.59)**

Financing activities				
Repayment of borrowed funds		(527.01)		(416.14)
Interest and financial charges to banks		1.90		4.04
Net cash flow from financing activities (C)			**(525.11)**	**(412.10)**
Net Cash flow during the year (A+B+C)			**31.57**	**1.26**
Cash and Cash Equivalents at the beginning of the year			**6.84**	**5.58**
Cash and Cash Equivalents at the end of the year			**38.41**	**6.84**
Cash and Cash Equivalent				
Balances with Banks:				
In current accounts			38.24	6.12
Cash and Cheques on hand			0.17	0.72
Total			**38.41**	**6.84**
Significant Accounting Policies	**XVI**			
Notes to Accounts forming part of Financial Statements	**XVII**			

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 Deloitte Haskins & Sells LLP
Chartered Accountants

Kalpesh J. Mehta
Partner
Membership No. 048791
Firm Reg. No. 117366W/W-100018

For and on behalf of the Board,

T Nanda Kumar
Chairman

Dilip Rath
Managing Director

Y Y Patil
General Manager
(Accounts)

Anand, 8th July, 2015

NDDB Funds

ANNEXURE I

₹ in million

		31.03.2015	31.03.2014
General Reserve (Note a)			
Balance as per last balance sheet		3,885.63	3,885.63
Grant for Fixed Assets (Note b)			
Balance as per last balance sheet	10.58		10.94
Less: Recoupment of depreciation (Refer Note 4 of Annexure VIII)	0.36		0.36
		10.22	10.58
Special Reserve under section 36 (1) (viii) of the Income-tax Act, 1961 (Refer Note 10)			
Balance as per last balance sheet	702.28		611.98
Add: Transfer from Income and Expenditure Account	120.47		90.30
		822.75	702.28
Income and Expenditure Account			
Balance as per last balance sheet	21,554.93		20,675.91
Add: Surplus after appropriation during the year	614.20		879.02
		22,169.13	21,554.93
Total		**26,887.73**	**26,153.42**

Notes :

a. 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.

b. In accordance with Accounting Standard - 12 on Accounting for Government Grants.

Secured Loans

ANNEXURE II

₹ in million

		31.03.2015	31.03.2014
Bank Overdraft (Secured against lien on fixed deposits with Banks)		13.89	540.90
Total		**13.89**	**540.90**

Current Liabilities and Provisions

ANNEXURE III

₹ in million

		31.03.2015	31.03.2014
a) Current Liabilities			
Advances and deposits		17.04	20.08
Sundry creditors		216.04	177.07
Net liability on account of Turnkey Project			
Funds received	12,569.02		11,363.54
Add: Due to suppliers for expenses	612.76		718.85
	13,181.78		12,082.39
Less : Expenditure incurred	10,300.76		10,139.07
Advance to suppliers	733.99		159.98

	2,147.03		1,783.34
Add : Payable to NDDB (Per contra, Refer ANNEXURE VI)	44.83		52.18
		2,191.86	1,835.52
b) Provisions for (Refer Note 11 of Annexure XVII)			
Non-performing assets	3,444.30		3,492.62
General contingency on Standard Assets	28.69		23.29
Contingency	616.77		580.99
		4,089.76	4,096.90
c) Provisions for :			
Leave encashment (Refer Note 7 of Annexure XVII)	246.31		187.85
Post retirement medical scheme (Refer Note 7 of Annexure XVII)	76.86		66.22
Gratuity (Refer Note 7 of Annexure XVII)	16.59		4.80
VRS monthly benefits	63.15		84.38
Wealth tax	1.03		0.80
		403.94	344.05
Provisions for income tax (net of taxes paid)		182.53	216.73
Total		**7,101.17**	**6,690.35**

Note : Sundry creditors include ₹ Nil (Previous Year: ₹ 12.85 million) of funds received from Government of India for Assistance to Co-operative Projects.

Cash and Bank Balances

ANNEXURE IV

₹ in million

		31.03.2015	31.03.2014
Balances with Banks			
In fixed deposits (Note a and b)	7,734.30		9,384.95
In current accounts	38.24		6.12
		7,772.54	9,391.07
Cash and cheques on hand		0.17	0.72
Total		**7,772.71**	**9,391.79**

Notes :

a. Fixed deposits includes ₹ Nil (Previous Year: ₹ 12.85 million) of funds received from Government of India for Assistance to Co-operative Projects pending utilisation.

b. Fixed deposits includes ₹ 1,355.40 million (Previous Year ₹ 2,217.70 million) placed with Banks which are under lien for the Overdraft facility.

Inventories

ANNEXURE V

₹ in million

		31.03.2015	31.03.2014
Stores, spares and others	2.03		17.59
Project equipment	4.57		14.80
	6.60		32.39
Less : Provision for obsolescence	5.20		30.79
		1.40	1.60
Total		**1.40**	**1.60**

Loans, Advances and Other Current Assets

ANNEXURE VI

₹ in million

		31.03.2015	31.03.2014
Loans to cooperatives			
Milk - Secured	7,521.72		6,613.50
Unsecured	152.14		178.95
		7,673.86	6,792.45
Oil (including interest accrued) - Unsecured		3,271.30	3,294.75
Loans and advances to subsidiary companies / managed units			
Secured	3,201.96		2,292.14
Unsecured	569.04		205.59
		3,771.00	2,497.73
Loans to employees			
Secured	2.04		2.64
Unsecured	8.57		7.04
		10.61	9.68
Interest accrued on -			
Loans and advances	73.41		78.38
Fixed deposits and investments	363.57		406.39
		436.98	484.77
Advances to suppliers and contractors		3.29	3.73
Recoverable on account of turnkey projects			
(Per contra, Refer Annexure III)		44.83	52.18
Sundry deposits		13.96	11.35
Income Taxes paid (net of provisions)		1,134.00	867.27
Tax refunds admitted as due		-	179.21
Other advances		82.78	96.16
Total		**16,442.61**	**14,289.28**

Note : Secured loans are secured against the mortgage of assets and / or hypothecation of stocks / assets.

Investments

ANNEXURE VII

₹ in million

		31.03.2015	31.03.2014
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
NDDB Dairy Services (NDS)	2,000.00		2,000.00
		4,873.90	4,873.90
Bonds in:			
Government companies, financial institutions and banks		2,804.52	2,654.18
Shares (unquoted) in Co-operatives and Federations	1.00		1.00
Less: Provision for diminution in value of investments	0.10		0.10
		0.90	0.90
Total		**7,679.32**	**7,528.98**

Fixed Assets

ANNEXURE VIII

₹ in million

Particulars	Gross Block (at Cost)				Depreciation/Amortization				Net Block	
	As at 01.04.2014	Additions	Deductions/ (adjustments)	As at 31.03.2015	As at 01.04.2014	For the year	Deductions/ (adjustments)	As at 31.03.2015	As at 31.03.2015	As at 31.03.2014
Freehold Land	451.17	-	-	451.17	-	-	-	-	451.17	451.17
Leasehold Land	64.16	-	-	64.16	9.28	0.75	-	10.03	54.13	54.88
Building and Roads	1,861.31	72.28	-	1,933.59	832.13	54.04	-	886.17	1,047.42	1,029.18
Plant and Machinery	385.43	-	324.46	60.97	342.85	0.27	283.67	59.45	1.52	42.58
Electrical Installations	275.67	9.02	0.82	283.87	174.55	17.88	0.65	191.78	92.09	101.12
Furniture, Computers & other Equipments	1,451.23	64.80	109.73	1,406.30	1,216.56	126.18	108.28	1,234.46	171.84	234.67
Rail Milk Tankers	217.83	-	-	217.83	217.83	-	-	217.83	-	-
Vehicles	27.01	-	3.91	23.10	22.32	1.55	3.90	19.97	3.13	4.69
Total	**4,733.81**	**146.10**	**438.92**	**4,440.99**	**2,815.52**	**200.67**	**396.50**	**2,619.69**	**1,821.30**	**1,918.29**
Previous Year	*4,872.69*	*144.12*	*283.00*	*4,733.81*	*2,752.34*	*256.99*	*193.81*	*2,815.52*	*1,918.29*	*2,120.36*
Capital Work in Progress									80.98	29.87
Total fixed assets									**1,902.28**	**1,948.16**

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.
4. Depreciation for the year excludes depreciation ₹ 0.36 million (Previous year : ₹ 0.36 million) on account of recoupment from grants received.

Service Charges

ANNEXURE - IX

₹ in million

	2014-2015	2013-2014
Training fees	2.61	2.82
Management fees	1.78	1.51
Procurement and technical service fees	112.71	60.98
Fees from consultancy and feasibility studies	0.34	3.63
Royalty and process knowhow fees	2.71	1.73
Total	**120.15**	**70.67**

Other Income

ANNEXURE - X

₹ in million

	2014-2015	2013-2014
Profit on sale of fixed assets (net)	1.22	3.10
Excess provision and NPAs written back	-	456.79
Miscellaneous income	26.12	28.69
Total	**27.34**	**488.58**

Remuneration and benefits to employees

ANNEXURE - XI

₹ in million

	2014-2015	2013-2014
Salaries and Wages (including ex-gratia and retainership fees)	482.86	371.02
Contribution to Provident, Superannuation fund and Gratuity	111.85	78.87
Staff welfare expenses	48.27	21.64
Total	**642.98**	**471.53**

Remuneration excludes ₹ 13.18 million (Previous year : ₹ 10.67 million) shown as part of Research and Development expenses.

Cost of Materials Sold

ANNEXURE - XII

₹ in million

	2014-2015	2013-2014
Opening Stock	-	4,023.23
Add: Purchases	-	-
Add: Expenses (net)	-	67.71
Less: Closing Stock	-	-
Total	**-**	**4,090.94**

Administrative Expenses

ANNEXURE - XIII

₹ in million

		2014-2015	2013-2014
Printing and stationery		5.90	3.55
Communication charges		6.45	8.21
Audit fees and expenses (including service tax)			
Audit fees	0.74		0.67
Tax audit	0.25		0.22
Fees for other services	0.08		-
Out of pocket expenses	0.05		0.03
		1.12	0.92
Legal fees		0.90	0.84
Professional fees (Note 4 of Annexure XVII)		44.46	31.39
Vehicle expenses		3.56	3.72
Recruitment expenses		0.48	1.06
Advertisement expenses		4.23	7.19
Travelling and conveyance expenses		61.00	48.58
Electricity and rent		24.66	26.50
Other administrative expenses		4.42	3.81
Total		**157.18**	**135.77**

Maintenance of Assets

ANNEXURE - XIV

₹ in million

	2014-2015	2013-2014
Repairs and maintenance		
Buildings	129.44	92.50
Others	56.74	36.98
Rates and taxes	3.86	13.76
Insurance	1.42	1.66
Total	**191.46**	**144.90**

Other Expenses

ANNEXURE - XV

₹ in million

	2014-2015	2013-2014
Training expenses	24.22	21.88
Computer expenses	10.87	12.17
Loss on sale of investment (net)	4.61	10.81
Other expenditure	19.32	26.85
Total	**59.02**	**71.71**

National Dairy Development Board ("NDDB" or "the Board")

Significant Accounting Policies Forming Part of Financial Statements

ANNEXURE XVI

1. Method of Accounting

The financial statements are prepared on accrual basis, using the historical cost convention and generally accepted accounting principles in India including accounting standards issued by the Institute of Chartered Accountants of India, as applicable to the Board.

2. Use of Estimates

The preparation of financial statements in conformity with the Generally Accepted Accounting Principles in India which requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenues and expenses and the disclosure of contingent liabilities. Such estimates and assumptions are based on the Management's evaluation of relevant facts and circumstances as on the date of the financial statements. 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 for asset classification. Provision for Non-Performing Assets is made at the rates approved by the Board.

4. Revenue Recognition

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

Interest income on fixed deposits with Bank and 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.

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.

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.

Further, the Board has participated in Group Gratuity cum Life Assurance Scheme of Life Insurance Corporation of India.

8. Fixed Assets 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 fixed assets 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 per cent 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 equipments	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”.

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 - at cost of acquisition.

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

Premium on purchase of debentures / bonds in Government Companies, Financial Institutions and Banks is charged to Income and Expenditure Account over the maturity period. Discount on purchase of these investments is recognised in the year of realisation.

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 exgratia 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.

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 and 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 had made allocation of contingency provision for possible diminution in value of its asset or for unforeseen events leading to such liability.

Notes to Accounts Forming Part of Financial Statements

ANNEXURE XVII

1 At the request of the concerned authorities, the NDDB has been managing the Jalgaon Jilha Sahakari Dudh Utpadak Sangh Maryadit, West Assam Milk Producers' Co-operative Union Ltd. and Jharkhand State Cooperative Milk Producers' Federation Ltd. These are separate and independent entities and their accounts are audited separately.

2 Contingent Liabilities:

2.1. Principal amount of claims not acknowledged as debt : ₹ 343.92 million (Previous Year : ₹ 343.39 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) pending before various appeal forums ₹ 735.28 million (Previous Year : ₹ 1,007.05 million)

2.4. Service tax demands (excluding interest and penalty applicable under respective statutory provisions) pending before Tribunal ₹ 517.48 million (Previous Year : ₹ 547.19 million)

2.5. Other Demands :

₹ in millions

Particulars	Authority	2014-15	2013-14
Settlement of Land dues	Land and Land Reform Department, Siliguri	0.39	0.39
Interest Demand on delayed payment of municipal taxes	Collector, Mumbai Suburban	1.71	1.71
Combined Effluent Treatment Plant (CETP) charges, Ground Rent and Maintenance Charges	Delhi State Industrial and Infrastructure Development Corporation Limited, Narela	3.30	2.51
Demand for Municipal Tax for Land at Itola	Taluka Development Officer, Vadodara	4.73	-

Demands presented herein above 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 receipt of judgment / decision of the forums where the demands are contested.

3 Funding for National Dairy Plan – I (NDP-I) is through a line of credit from International Development Association, which along with the share of Government of India, flows from the budget of Department of Animal Husbandry, Dairying and Fisheries to the Project Management Unit (PMU) in NDDB as "Grant-in-aid for onward distribution to the End Implementation Agencies". A separate bank account is being maintained for receipt of funds. Separate Project accounts are being maintained for NDP-I funds which are audited by the statutory auditors of NDDB.

4 Professional fees include ₹ 3.14 million (Previous Year : ₹ 1.90 million) paid to the firm in which one of the partner of the audit firm is a partner.

5 Segment information :

NDDB 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 NDDB revolve around the Dairy / Agriculture sector which in terms of Accounting Standard-17 on "Segment Reporting" constitute a single reportable segment.

6 Disclosure of related party and Transactions with them for the year ended 31st March, 2015 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
NDDB Dairy Services
Pristine Biologicals (NZ) Limited (w.e.f. 3rd October, 2014) (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 Limited (WAMUL)
Animal Breeding Research Organisation
Anandalaya Education Society
Jharkhand State Cooperative Milk Producers' Federation Limited (JMFL)

3) Key management personnel

Mr. T Nanda Kumar	Chairman
Mr. Dilip Rath	Managing Director
Mr. Sangram Chaudhri	Executive Director

b) Transactions with related parties

(figures in Italic represent previous year figures)

₹ in millions

Particulars	Interest Income	Dividend	Rent (Income)	Grant	Sale of Fixed Assets	Sale of Dairy Commodities	Sale of Other Items	Other income	Other Expenditure	Current Account Balance outstanding Dr/(Cr)	Loan Disbursed	Loan repaid / Adjusted		Loan Balance outstanding Dr/(Cr)
												Principle	Interest	
Subsidiary Companies														
IDMC Limited	75.94 *69.59*	10.93 -	1.49 *1.91*	- -	- -	- -	- *0.37*	0.15 *0.31*	0.03 *0.75*	0.03 *0.13*	589.36 *270.00*	361.92 *582.88*	75.21 *67.19*	916.02 *688.58*
Indian Immunologicals Limited	67.81 *62.41*	13.50 *13.50*	22.10 *22.40*	- -	- -	- -	- -	1.61 *0.07*	2.93 -	(8.86) *(13.69)*	350.00 *73.20*	140.16 *196.32*	59.84 *49.93*	988.46 *778.62*
Mother Dairy Fruit and Vegetable Private Limited	93.45 *41.46*	- *150.00*	101.98 *96.97*	- -	40.97 -	- *3,183.78*	- -	0.55 *0.53*	41.57 *62.04*	65.59 *62.00*	311.13 *573.33*	54.84 *580.55*	93.45 *41.46*	1,111.87 *855.59*
NDDB Dairy Services	6.25 *1.59*	- -	1.49 *1.40*	- -	- *0.18*	- -	- -	0.04 *3.71*	- *1.20*	1.02 *3.72*	734.65 *180.11*	327.58 *56.40*	- -	532.42 *125.22*
Total	**243.45** ***175.05***	**24.43** ***163.50***	**127.06** ***122.68***	**-** -	**40.97** ***0.18***	**-** ***3,183.78***	**-** ***0.37***	**2.35** ***4.62***	**44.53** ***63.99***	**57.78** ***52.16***	**1,985.14** ***1,096.64***	**884.50** ***1,416.14***	**228.49** ***158.58***	**3,548.77** ***2,448.01***
Other enterprises where management has significant influence over the management														
WAMUL	0.95 *2.31*	- -	- -	- -	- -	- *51.00*	- -	0.12 *0.06*	- -	0.02 -	31.00 *56.23*	29.09 *72.67*	0.95 *2.31*	30.62 *28.71*
Animal Breeding Research Organisation	- -	- -	- -	- *0.03*	- -	- -	- *0.25*	0.81 *8.12*	- -	0.53 *1.00*	- -	- -	- -	- -
Anandalaya Education Society	- -	- -	0.48 *0.56*	- -	- -	- -	- -	0.04 *0.02*	- -	0.34 *0.23*	- -	- -	- -	- -
JMFL	-	-	-	-	-	-		0.11	-	-	-	-	-	-
Total	**0.95** ***2.31***	**-** -	**0.48** ***0.56***	**-** ***0.03***	**-** -	**-** ***51.00***	**-** ***0.25***	**1.08** ***8.21***	**-** -	**0.89** ***1.22***	**31.00** ***56.23***	**29.09** ***72.67***	**0.95** ***2.31***	**30.62** ***28.71***

Remuneration to key management personnel

Mr. T Nanda Kumar	2.33 *0.15*
Mr. Dilip Rath	2.74 *2.32*
Mr. Sangram Chaudhri	2.91 *2.54*
Dr. Amrita Patel (Chairman till 26th February, 2014)	- *1.79*
Total	**7.98** ***6.80***

7 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 ₹ 39.74 millions (Year ended 31 March, 2014 ₹ 36.18 millions) for Provident Fund contributions and ₹ 26.59 millions (Year ended 31 March, 2014 ₹ 23.96 millions) 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)

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 millions

Particulars	Year ended 31 March, 2015			Year ended 31 March, 2014		
	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	8.91	-	14.01	6.70	-	11.13
Interest cost	20.58	6.13	17.38	16.75	6.49	15.00
Expected return on plan assets	(19.78)	-	-	(18.83)	-	-
Actuarial losses / (gains)	37.46	5.69	38.31	15.21	(16.04)	(4.22)
Total expense recognised in the Income and Expenditure Account	**47.17**	**11.82**	**69.70**	**19.83**	**(9.55)**	**21.91**
Actual contribution and benefit payments for year						
Actual benefit payments	(14.60)	(1.18)	(11.24)	(19.20)	(2.94)	(15.91)
Actual contributions	35.34	-	-	12.96	-	-
Net asset / (liability) recognised in the Balance Sheet						
Present value of defined benefit obligation	(274.86)	(76.86)	(246.31)	(222.51)	(66.22)	(187.85)
Fair value of plan assets	258.27	-	-	217.71	-	-
Net asset / (liability) recognised in the Balance Sheet	**(16.59)**	**(76.86)**	**(246.31)**	**(4.80)**	**(66.22)**	**(187.85)**
Change in defined benefit obligations (DBO) during the year						
Present value of DBO at beginning of the year	222.51	66.22	187.85	203.05	78.71	181.85
Current service cost	8.91	-	14.01	6.71	-	11.13
Interest cost	20.58	6.13	17.38	16.75	6.49	15.00
Actuarial (gains) / losses	37.46	5.69	38.31	15.21	(16.04)	(4.22)
Benefits paid	(14.60)	(1.18)	(11.24)	(19.20)	(2.94)	(15.91)
Present value of DBO at the end of the year	**274.86**	**76.86**	**246.31**	**222.53**	**66.22**	**187.85**
Change in fair value of assets during the year						
Plan assets at beginning of the year	217.72	-	-	205.13	-	-
Acquisition adjustment	-	-	-	-	-	-
Expected return on plan assets	19.78	-	-	18.83	-	-

Actual company contributions (Excluding Contribution made by Gratuity Trust and charges deducted by LIC)	35.37	-	-	12.95	-	-
Actuarial gain / (loss)	-	-	-	-	-	-
Benefits paid	(14.60)	-	-	(19.20)	-	-
Plan assets at the end of the year	**258.27**	**-**	**-**	**217.71**	**-**	**-**
Actual return on plan assets	19.78	-	-	18.83	-	-
Composition of the plan assets is as follows:						
Government bonds	55%	-	-	20%	-	-
PSU bonds	40%	-	-	20%	-	-
Equity mutual funds	5%	-	-	0%	-	-
Others	0%	-	-	60%	-	-
Actuarial assumptions						
Discount rate	7.75%	7.75%	7.75%	9.25%	9.25%	9.25%
Expected return on plan assets	9.09%	NA	NA	9.00%	NA	NA
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	5.00%	NA	NA	5.00%	NA
Mortality tables	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates and LIC (1994-96) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates and LIC (1994-96) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates

Experience adjustments

₹ in millions

Particulars	2014-2015	2013-2014	2012-2013	2011-2012	2010-2011
Gratuity					
Present value of DBO	274.86	222.51	203.05	162.30	144.89
Fair value of plan assets	(258.27)	(217.71)	(205.13)	(179.06)	(159.90)
Funded status [Surplus / (Deficit)]	(16.59)	(4.80)	2.08	16.76	15.01
Post-Retirement medical benefits schemes (PRMBS)					
Present value of DBO	76.86	66.22	78.71	71.36	65.03
Other defined benefit plans (Leave Encashment)					
Present value of DBO	246.31	187.85	181.85	137.49	121.94

	For the year ended 31 March, 2015	For the year ended 31 March, 2014
Actuarial assumptions for long-term compensated absences		
Discount rate	7.75%	9.25%
Expected return on plan assets	9.09%	9.00%
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 2015-16 has not been ascertained.

8 Disclosure as per Accounting Standard 19 regarding Leased Assets (Refer Annexure VIII):

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

a) Nature of Assets leased

₹ in millions

Class of Asset	Gross value of assets at 31st March, 2015	Depreciation for the year	Accumulated Depreciation as at 31st March, 2015
Buildings and Roads#	1,624.06 *1,629.97*	46.23 *46.03*	746.23 *706.31*
Electrical Installations#	173.87 *175.82*	9.85 *12.65*	118.09 *109.70*
Plant & Machinery	0.38 *317.93*	- *31.73*	0.38 *279.08*
Furniture, fixtures, computers, software and office equipment	587.33 *662.58*	47.17 *68.97*	574.63 *601.34*
Rail Milk Tankers	195.39 *196.84*	- -	195.39 *196.84*
Vehicles	- *0.43*	- -	- *0.43*
Total	**2,581.03** ***2,983.57***	**103.25** ***159.38***	**1,634.72** ***1,893.70***

including staff quarters and cold storage

(Figures in *italics* represent previous year figures)

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.

9 Deferred tax assets have been recognised as per Accounting Standard 22 on Accounting for Taxes on Income issued by Institute of Chartered Accountants of India. Details are as under:

₹ in millions

Particulars	Opening Balance as at 1st April, 2014	Adjustment during the year	Closing Balance at 31st March, 2015
Deferred Tax Assets :			
Depreciation	80.32 *69.81*	(4.06) *10.51*	76.26 *80.32*
Expenditure allowable on payment basis	67.31 *55.09*	19.13 *12.22*	86.44 *67.31*
Gratuity	1.63 -	4.11 *1.63*	5.74 *1.63*
Voluntary Retirement Scheme	55.21 *86.95*	(33.35) *(31.74)*	21.86 *55.21*
Total	**204.47** ***211.85***	**(14.17)** ***(7.38)***	**190.30** ***204.47***

(Figures in *italic* represent previous year figures)

10 The Board has no intention to make withdrawal from the Special Reserve created and maintained under section 36(1)(viii) of the Income-tax Act, 1961 and hence it becomes a permanent difference. The Board does not create any deferred tax liability on the said reserve in accordance with the clarification of the Accounting Standard Board of the Institute of Chartered Accountants of India.

11 Disclosure as per Accounting Standard 29 regarding Provisions, Contingent Liabilities and Contingent Assets is as follows:

₹ in millions

Particulars	Non-Performing Asset (NPA)	General Contingency on Standard Assets	Contingency
Opening balance	3,492.62 *4,190.87*	23.29 *31.59*	580.99 *560.78*
Write-off of interest receivable	(7.14) *(229.55)*	- -	- -
Amount transferred	(28.45) *(11.91)*	28.45 *(8.30)*	- *20.21*
Transferred to Contingency*	(12.73) -	(23.05) -	35.78 -
Reversed during the year	- *(456.79)*	- -	- -
Closing balance	**3,444.30** ***3,492.62***	**28.69** ***23.29***	**616.77** ***580.99***

(Figures in *italic* represent previous year figures)

*General Contingency provision / NPA provision in excess of regulatory requirement is transferred to Contingency Provision during the year.

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

In terms of our report attached.

For Deloitte Haskins and Sells LLP
Chartered Accountants

Kalpesh J. Mehta
Partner
Membership No. 048791
Firm Reg. No. 117366W/W-100018

For and on behalf of the Board,

T Nanda Kumar
Chairman

Dilip Rath
Managing Director

Y Y Patil
General Manager
(Accounts)

Anand, 8th July, 2015

Management Committees

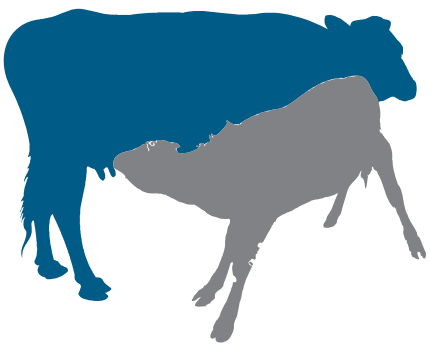
The NDDB Act 1987 provides for the constitution of Management Committees for NDDB managed and subsidiary Units. The Board is of the view that the management of these Units can best be done through such Committees. The Board determines the number of persons to constitute the Management Committees subject to the condition that in each such Committee, either the Chairman or a full-time Director shall be a member. The Management Committees function under the general control, direction and superintendence of the Board and for such duration and in such manner as the Board directs.

Members of Management Committees

Jalgaon Jilha Sahakari Dudh Utpadak Sangh Maryadit, Jalgaon

Shri Sangram R. Chaudhary	:	Chairman
Shri MN Buch	:	Member
Dr. SK Dalal	:	Member
Shri Anil S. Hatekar	:	Member
Shri SN Patil	:	Co-opted Member
Mrs. Geeta S Chaudhari	:	Co-opted Member
Mrs. AA Barhate	:	Co-opted Member
Shri RS Patil	:	Co-opted Member
Shri MM Patil	:	Co-opted Member
Shri Manoj Limaye	:	Member-Convenor

NDDB OFFICERS



NDDB Officers

Head Office, Anand

Chairman & Chief Executive

T Nanda Kumar,
M Sc (Phy), IAS (Retd.)

Managing Director

Dilip Rath,
M A (Eco), M Sc (Eco)

Executive Director

Sangram Chaudhary,
M Sc, PGDRM

Chief Executive's Office

A Rajasekaran, SR MGR,
M Sc (Agri), PGDRM

T V Balasubramanyam, MGR,
B Com, LLB (Gen)

Financial and Planning Services

S K Dalal, GEN MGR,
BVSc & AH, M Sc (Anim Sci), PGDRDM

K Manek, SR MGR,
B Com, AICWA

P C Patnaik, SR MGR,
M Com

T T Vinayagam, SR MGR,
B E (Agri), PGDRM

Pramod N Menon, MGR,
B Com, MBA (Fin)

Chintan Khakhariawala, MGR,
B E (Chem), MBA (Fin)

P V Subrahmanyam, MGR,
BBM, MBA (Fin)

Swati Srivastav, MGR,
B Sc (Phy), PGDRM

Kahnu C Behera, DY MGR,
B Sc (Agri), PGDRM

Chandan Singh, DY MGR,
B Sc (Zoo), PGDM (Mktg & Fin)

Smriti Singh, DY MGR
B A (Eng), PGDM (Mktg & HR)

Rohan B Buch, DY MGR,
B Com, MBA (Fin)

Chandni A Bhatt, DY MGR,
B Com, PGDBM (E-Com), MBA (Fin)

Shilpa P Behera, DY MGR,
BMS, PGDRM

Saurabh Kumar, DY MGR,
B Tech (Elect & Comm), PGDM

Reeti, DY MGR,
B Sc (Zoo), PGDM (Fin & Mktg)

Harsh Vardhan, DY MGR,
B Tech (Electro), PGDM (Fin)

Cooperative Services

NDDB, Anand
M C Shah, DY GEN MGR,
B Sc (DT), PGDRDM

Dhanraj Sahani, SR MGR,
MBA (Mktg), DPCS

Hrishikesh Kumar, MGR,
B Sc (Phy), PGDRM

Sandeep Dheeman, MGR,
B Com, M A (SW)

Sandeep Bharti, MGR,
B Sc, PGDDM

Chandrakant C Vegda, DY MGR,
B A (Eng Lit), MSW, PGDCCM

Priyadarshini Paliwal, DY MGR,
B Sc (Genetics), PGDRM

NDDB, Bangalore
M S Sayed, GEN MGR,
B E (Civil), M E (Env Engg)

D K Sharma, DY GEN MGR,
M Sc (Dairy Micro),
Ph D (Dairy Bacteriology)

S Rajeev, DY GEN MGR,
B Tech (Industrial Engg), PGDRM

Rajni B Tripathi, MGR,
B Sc (Bot), MSW, PGDIRPM

Nidhi Negi Patwal, DY MGR,
B Sc, M Sc (Chemistry), PGDRM

NDDB, Kolkata
Sajal Biswas, DY GEN MGR,
B Sc (DT), PGDIM

Sabyasachi Roy, MGR,
B Sc (Agri) Hons, M Sc (Agri), PGDRD

NDDB, Mumbai
M N Buch, GEN MGR,
B Sc, LLB, MLW

R S Lahane, DY GEN MGR,
B Tech (Chem), PGDRM

A S Hatekar, SR MGR,
M Sc (Agri)

Niranjan M Karade, MGR,
B E (Mech), PGDRM

Rahul Tripathi, DY MGR,
B.Com, MBA (Fin)

NDDB Office, Aurangabad
Abhay Muley, MGR,
B Tech (DT)

NDDB Office, Bhopal
Seema Mathur, MGR,
M A (Eng)

NDDB Office, Bhubaneswar
Subhankar Nanda, DY MGR,
BVSc & AH, MVSc (AN)

NDDB Office, Chandigarh
S K Attri, MGR,
B Tech (DT)
Dhanraj Khatri, MGR,
B A, MA (SW)

NDDB Office, Chennai
A Krithiga, MGR,
B Sc (Agri)

NDDB Office, Hyderabad
Latha Siripurapu, MGR,
B Com, PGDBA (Fin)

NDDB Office, Jaipur
Pretesh Joshi, MGR,
B E (Mech), PGDRM

NDDB Office, Lucknow
Mohd Rashid, MGR
B A, PGDDM

NDDB Office, Patna
Vishal Kumar Mishra, MGR,
B A, M A (SW)

NDDB Office, Trivandrum
M Govindan, SR MGR,
M A (SW)

Quality Assurance

Sunil Bakshi, DY GEN MGR,
M Sc (Dairy Bacteriology)

NDDB Officers

Narinder Sharma, DY GEN MGR,
M Sc (Dairying), PGDMM

S D Jaisinghani, SR MGR,
B Sc (DT), PGDHRM

M K Rajput, MGR,
B Sc, B E (Food Engg & Tech)

Suresh Pahadia, MGR,
B Tech (Dairy Tech),
M Sc (Dairying)

Product & Process Development

Sunil Bakshi, DY GEN MGR,
M Sc (Dairy Bacteriology)

A K Jain, SR MGR,
B Sc (DT), M Sc (Dairying)

Jitender Singh, SCI II,
B Sc, M Sc (Micro), Ph D (Dairy Micro)

Sougata Das, SCI I,
B Tech (DT), M Sc (Dairy Micro)

Harendra P Singh, SCI I,
B Tech (DT), M Sc (Dairy Chem)

Coordination & Monitoring Cell

Aditya Nath Jha, GEN MGR,
B A (Eng), PGDRD

V K Ladhani, DY GEN MGR,
M Com, SAS (Comm), ICWA (Inter)

Y M Patel, DY GEN MGR,
B Sc (DT)

M R Mehta, SR MGR,
M Sc (Stats), Dipl (Comp Sc)

Arvind Kumar, MGR,
B Sc (Agri), M Sc (Agri Mktg & Coopn)

Naveen Kumar, MGR,
M Sc (Env Sc), M Tech (Env Sc & Engg),
M Sc (Env Mod & Mgmt)

Mamata Mishra, MGR,
B A (Sociology), M A (Sociology),
Ph D (Sociology), MBA

Hemali Bharti, MGR,
B E (Power Elect.), MBA (Fin)

Rajesh Kumar, MGR,
B A (Eco), PGDRM

Ashutosh K Mishra, MGR,
B Sc (E&I), PGDBA (Fin)

Ravindra G Ramdasia, DY MGR,
B Com, CA, CS

Vibhavini Singh, DY MGR,
B Sc (Stats), PGDRDM

Human Resource Development

Soumesh Roy, GEN MGR,
M A (Eco), Dip In Pers Mgmt,
Dip in Trng & Dev

Ashok Kumar Gupta, DY GEN MGR,
M Sc (Agri), PGCHRM

P K Mehta, SR MGR,
M Sc (Dairying)

Rajesh Gupta, SR MGR,
B Sc, MSW

Jaidev Biswas, SR MGR
B Sc (Chem), PGDRD

S B Padhiar, SR MGR,
B A (Socio)

S S Gill, SR MGR,
B Sc (Geo), MSW, Ph D (SW),
Dipl (Trg & Dev)

K M Shah, MGR,
B Com, LLB (Gen), LLB (Spl), DTP

Anindita Baidya, MGR,
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B E (Mech), M Tech (HRD)

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M A (Dev Admn)

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Mansinh Institute of Training, Mehsana
Hitendrasinh Rathod, DY MGR,
DEE

Regional Demonstration & Training Centre, Erode
L C Nunes, DY GEN MGR,
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D Narayanasamy, PRINCIPAL,
BVSc

TP Aravinth, MGR,
BVSc & AH, MVSc (Vet Micro)

Divya TR, DY MGR,
BVSc & AH, MVSc (Animal Rep Gynecology & Obstetrics)

Regional Demonstration & Training Centre, Jalandhar
A D Patel, SR MGR,
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N K Saxena, SR MGR,
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DEE

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Dipl (Exp Mgmt)

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Sougata Bhar, SR MGR,
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Narendra H Patel, SR MGR,
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Krishna SY, SR MGR,
B E (Mech), M Tech (Produ. Mgmt.)

Mohd Nasim Akhter, MGR,
B E (Mech)

Nilesh K Patel, MGR,
B E (Prodn)

Bhadrasinh J Gohil, MGR,
B E (Mech)

Amol M Jadhav, MGR,
B E (Mech)

Nidhi Raval, MGR,
B Sc (Bot), MSW

Tilak Singh Negi, DY MGR,
Dip in Ind Engg, B E (Manuf),
PGDBA (Opern Mgmt)

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B E (Prod), PGD (Opern Mgmt)

Public Relations & Communications

Abhijit Bhattacharjee, SR MGR,
B Sc, LLB, PGDRD

Basuman Bhattacharya, SR MGR,
B Sc (Bot), M A (Journalism),
Dipl in Social Comm (Film Making)

Divyaraj R Brahmbhatt, DY MGR,
BA (Eng), PGDBA, MBA (PR)

Engineering Services

S N Singhal, GEN MGR,
B Tech (Agri Engg), M Tech (Dairy Engg)

S S Hardaha, DY GEN MGR,
B E (Mech)

P V Nadgouda, DY GEN MGR,
B E (Civil), PGDM (Mktg)

A K Chakraborty, DY GEN MGR,
B Tech (Agri Engg),
M Tech (Industrial Mgmt)

Shashi Kumar, DY GEN MGR,
B Sc (Elect)

G Rajagopal, DY GEN MGR,
B E (Elect)

P Saha, DY GEN MGR,
B Tech (Agri Engg)

Santosh Singh, DY GEN MGR,
B Tech (Civil)

S Goswami, DY GEN MGR,
B E (Mech), PGDRDM

U B Das, DY GEN MGR,
B E (Mech)

A B Ghosh, SR MGR,
M Tech (D & F Engg)

S C Surchowdhury, SR MGR,
B E (Elect)

G S Sarvarayudu, SR MGR,
B Tech (Civil)

V Srinivas, SR MGR,
B E (Civil)

S Chandrasekhar, SR MGR,
B E (Mech)

S Talukdar, SR MGR,
B E (Mech), MIE

S K Nasa, SR MGR,
B E (Civil)

NDDB Officers

Jasbir Singh, SR MGR,
B Tech (Agri Engg),
M Tech (Post Harvest Tech)

Chandra Prakash, SR MGR,
B Tech (Mech)

R S Sisodiya, SR MGR,
DME

R Soundhararajan, SR MGR,
AMIE (Mech)

S K Sharma, SR MGR,
DCE

R B Shah, MGR,
DEE

K S Patel, MGR,
B E (Civil)

Gopal K Narang, MGR,
B E (Civil), DIP-MCM

Saumitra Das, MGR,
B E (Civil)

Shailendra Mishra, MGR
Dip (Civil), Dip (Const Tech)

Mihir B Bagaria, MGR,
DCE, B E (Civil), MBA (Fin)

Rupesh A Darji, MGR,
B E (Elect)

Dhaval A Panchal, MGR,
B E (Elect)

D B Lalchandani, MGR
B E (Mech), MBA (Oprn)

Kousik Roy, MGR,
B Tech (Elec)

Nikesh V More, DY MGR,
B E (Inst & Cont Engg)

Vipul L Solanki, DY MGR,
B E (ECE)

Manish Sharma, DY MGR,
B Tech (Elect), MBA (HRD)

Abhishek Gupta, DY MGR,
B E (Mech)

Dharmendra K Behera, DY MGR,
B E (Mech), MBA (Mktg & Syst)

Prakash A Makwana, DY MGR,
B E (Elect)

Jay Nagar, DY MGR,
B E (Civil)

Bharat Singh, DY MGR,
B Tech (Mech)

Balbir Sharma, DY MGR,
DEE, B Tech (Elect)

Gaurav Singh, DY MGR,
B Tech (Civil)

Bibhash Biswas, DY MGR,
Dip (Civil)

Banas Dairy Project-III, Palanpur
S S Sinha, SR MGR,
B E (Elect)

Manoj Gothwal, MGR,
B E (Civil)

Charan Singh, DY MGR,
Dip (Civil), B Tech

Bharuch Dairy Project Site, Bharuch
Bhushan P Kapshikar, MGR,
B E (Civil)

Shailesh S Joshi, DY MGR,
B E (Mech)

Bhopal Dairy Expansion Project, Bhopal
Satendra Singh Gurjar, DY MGR,
B E (Mech)

Cattle Feed Plant, Ajmer
A S Bhadauria, MGR,
B E (Food Engg & Tech)

Cattle Feed Plant, Jaipur
Aditya Sharma, DY MGR,
B Tech (Civil), M Tech (CPM)

Cattle Feed Plant, Khurda
Dhiraj B Tembhurne, MGR,
B E (Civil)

Dairy Plant Project, Paladur
Ganesh Mohan Shenoy, DY MGR,
DCE, B E (Civil)

Hassan Dairy Expansion Project, Hassan
U Sundara Rao, DY MGR,
DEE, B Tech (EEE)

Hosakote Dairy Project, Hosakote
Sandipkumar P Patel, DY MGR,
B E (Civil), M Tech (Civil)

Hotwar Dairy Project, Hotwar
Pradip Layek, MGR,
B Tech (Elect)

IRMA Project
Tarak Rajani, DY MGR,
B E (Civil)

MIT, Mehsana Site
Jasdev Singh, MGR,
B Tech (Elec), M Tech (Power Engg)

Sudhir Kumar Gangal, MGR,
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Abbreviations

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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

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