राडेअनुसं समाचार

NDRI News

राष्ट्र के डेरी स्वप्नों को समर्पित
Fulfilling Nation's Dairy Dreams

भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल
ICAR-NATIONAL DAIRY RESEARCH INSTITUTE, KARNAL

www.ndri.res.in

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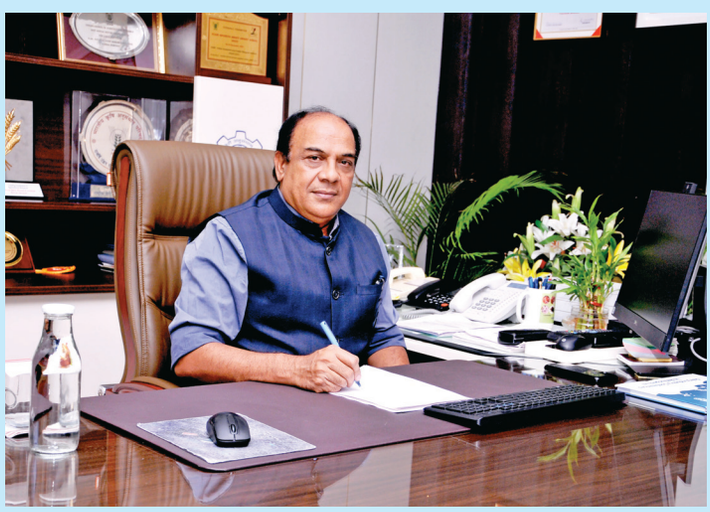
From the Director's Desk



India has approximately 20% of the world's livestock population and sustains around 17.5% of the global human populace, all within a mere 2.3% of the Earth's land area. Agriculture and allied sectors contribute a substantial 18.3% to India's Gross Domestic Product (GDP), valued at current prices in the fiscal year 2022-23. Within this, the livestock sector's Gross Value Added (GVA) stands impressively at Rs. 11.14 lakh crore (as of 2020-21 prices), comprising 31.87% of the agricultural and allied sector GVA and 6.17% of the nation's total GVA. Notably, the livestock sector's gross value of output (GVA plus intermediate consumption) amounts to Rs. 14.15 lakh crore, with milk alone contributing 66% (Rs. 9.32 lakh crore), followed by the meat group at 24% (Rs. 3.35 lakh crore), among others.

Government estimates reveal a robust Compound Annual Growth Rate (CAGR) of 7.67% for the livestock sector from 2014-15 to 2021-22 (at constant prices), propelled chiefly by dairy, bovine, poultry, goat farming, and pig farming. This growth trajectory, spanning five decades, owes much to the White Revolution, signifying a positive shift towards high-value food diversification away from cereals and pulses. India's dairy industry stands as the largest, constituting 24% of global milk production and directly supporting over 8 crore farmers. Bolstered by various government schemes, the dairy sector has experienced remarkable growth over the past decade, poised to sustain or accelerate further with increased private and public investments.

This success narrative primarily traces back to Operation Flood (1970-1996) and governmental emphasis on dairy development. Key initiatives included establishing milk supply chains and connecting urban markets, facilitated by robust institutional support such as dairy farmers' cooperatives. Research and Development (R&D) efforts by institutes under the Indian Council of Agricultural Research (ICAR) and private organizations have further propelled growth. Notable achievements include enhanced milk productivity through veterinary services, artificial insemination, and improved feed availability, complemented by strong extension activities and farmer education. ICAR-NDRI spearheads efforts

In this issue...

FROM THE DIRECTOR'S DESK	RESEARCH	EVENTS	EXTENSION	HONOURS AND AWARDS	PERSONALIA	राजभाषा एकक	SOUTHERN CAMPUS, BENGALURU	EASTERN CAMPUS, KALYANI
1	2	5	8	10	11	12	12	14

to sustain milk production growth through research and technological innovations, with technologies like high-quality semen for artificial insemination showing promise in boosting productivity.

Despite India's global leadership in milk production, its share in the global dairy export market remains negligible (< 1%). Ensuring conformity to international food safety norms presents a major challenge for Indian dairy exports, necessitating strategic investment in R&D and domestic supply chain infrastructure, alongside efforts to globalize the Indian dairy industry. Understanding the drivers of milk production growth, ensuring marketable surplus, and exploring trade opportunities are imperative, underlining the need for robust policies supported by credible data on milk production.

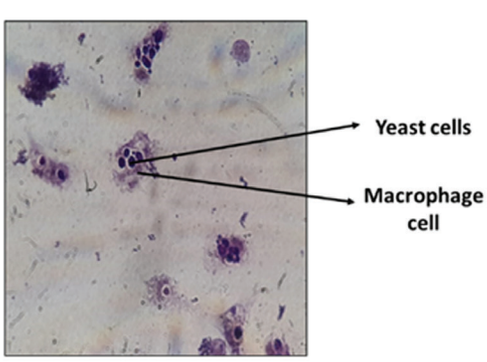
(Dr. Dheer Singh)
Director & Vice-Chancellor
ICAR-NDRI, Karnal

RESEARCH

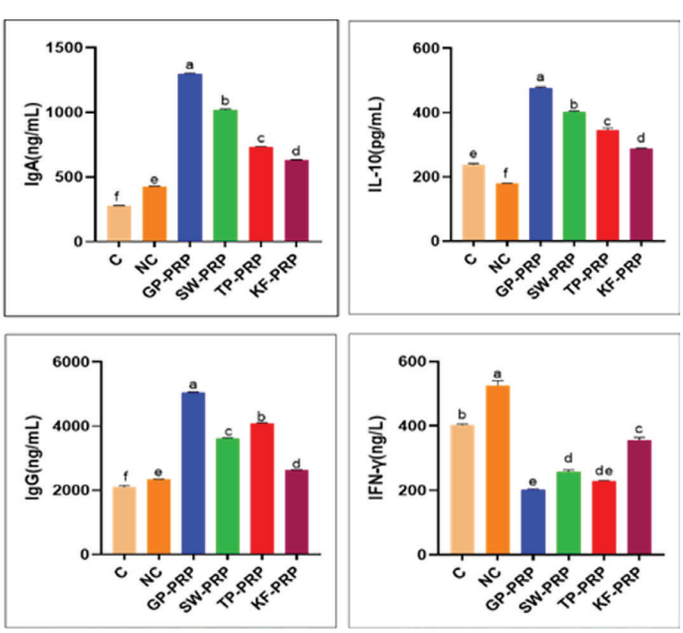
Immunomodulatory activity of proline-rich peptides (PRPs) from native Indian cow colostrum

(Vivek Kumawat, Shaik Abdul Hussain, Suman Kapila and Sathish Kumar, M.H.)

Immunomodulatory activity of proline-rich peptides (PRPs) derived from colostrum of native Indian cow breeds namely Gir, Sahiwal and Tharparkar were investigated in comparison to crossbred cows i.e. Karan Fries. PRP content was found to be highest in Gir (0.27±0.002 mg/ml) and lowest in Karan Fries (0.21±0.001 mg/ml). The immunomodulatory effect of the PRP was evaluated through the *in vivo* studies in mice model. *In vivo*, studies showed that PRP from indigenous breeds possesses better intestinal humoral immune response than the Karan Fries breed PRP and showed higher IgG and IgA concentrations. Gir breed showed the highest IgG (5.05±0.01 µg/mL); IgA (9.14±0.01µg/mL); anti-inflammatory cytokine IL-10 (476.66±3.66 pg/mL) concentrations and lowest concentration pro-inflammatory cytokines i.e. TNF-α (382.6±4.16 ng/mL) and IFN-γ (201.63±3.33 ng/mL). Phagocytic analysis indicated that PRP from the Gir breed has shown the highest phagocytic activity (% Phagocytosis 45.07±0.53) and PRP from the Karan fries breed has shown the lowest phagocytic activity (% Phagocytosis 39.69±0.69%).



C: Control; NC: Negative control challenged with pathogen; GR-PRP, SW-PRP, TP-PRP and KF-PRP: Mice groups fed with PRP from Gir, Sahiwal, Tharparkar and Karan Fries breeds

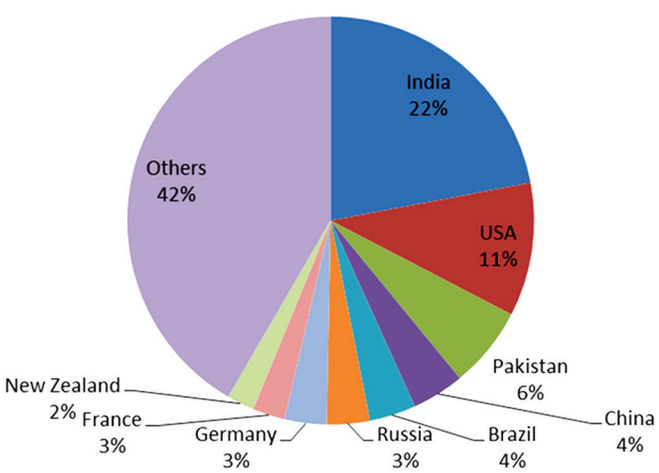


In vivo immunomodulatory activity of of proline-rich peptides derived from colostrum of different cow breeds

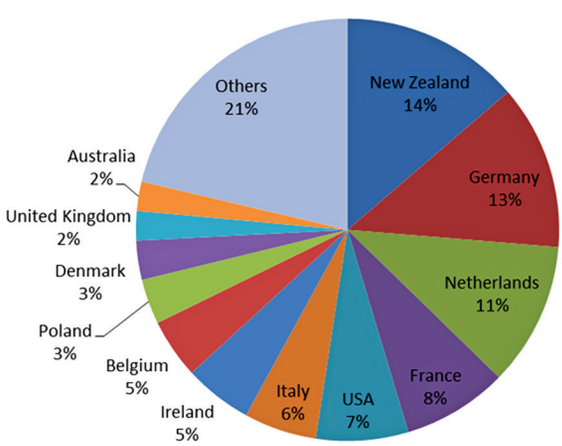
Indian Dairy in Global Perspective – Challenges and Options

(Gunjan Bhandari, Subhasis Mandal and Udita Chaudhary)

India accounts for a substantial portion (24%) of global milk production; however, its share in dairy exports is very meagre (0.5%). It is interesting to note that New Zealand, which accounts for only 2.37% of global milk production, contributes a whopping 13.69% to total global dairy exports. The other top dairy-exporting countries of the world are also far behind India in terms of milk production. This paradox raises multiple questions, and it's imperative to understand the drivers of dairy exports. Large exportable surplus available with the top exporting countries strengthens their export potential. Nevertheless, this doesn't completely explain India's poor performance.While India exports to over 100 countries, most sales are concentrated in nearby Asian markets. Its contribution to overall dairy imports of major importing countries is minuscule. The list of top dairy importers is dominated by European countries where India can strive to tap into the potential. India could further leverage its proximity to China, the second-largest dairy importer. Indian dairy exports can be boosted by implementing strategic measures focusing on production, quality, and market access. Establishing exclusive dairy export zones, enforcing quality assurance and enhancing value addition to cater to international standards will foster global consumer trust. Targeted product diversification, global marketing campaigns, market evaluation, and insight into import preferences are vital for sustained export growth.



Percentage share of different countries in global milk production in 2022



Percentage share of countries in total value of global dairy exports in 2022

Breed-wise economics of milk production in Gujarat – A comparative analysis

(Udita Chaudhary, Gunjan Bhandari and Biswajit Sen)

Secondary data analysis of the population of cattle and buffalo in India over the years revealed that the growth rate of the crossbred cattle population is the highest (range: 14.62% for in-milk animals to 15.14% for milch animals) and lowest for indigenous cattle and buffalo population (2.24% to 2.49% across different categories). District-wise growth rates of indigenous cattle, crossbred cattle, and buffalo population in the state of Gujarat were also estimated, and the state was classified into three zones of rapid, moderate, and low decline of indigenous cattle breeds. Furthermore, breed-wise diversity levels and factors affecting it were analyzed at the country level using secondary data. It was observed that the diversity level in both cattle (Simpson Index=0.457) and buffalo (Simpson Index=0.359) was low. Additionally, it was found that pasture and fallow land, rainfall, temperature, etc., affected breed diversity for cattle and buffalo. The impact of Artificial Insemination (AI) was found to be insignificant for cattle, although it was found to be positively significant for buffalo.

Institutional Technology Management Unit

Patents Filed

- ICAR-NDRI, Karnal filed two patents from January to March, 2024.
- The first patent was filed on March 21, 2024 for the innovation entitled "Method of preparing processed cheese from ultrafiltration retentate of cow milk" (Application No. 202411021939) by Yogesh Khetra.
- The second patent was filed on March 27, 2024 for the innovation entitled "A shelf-stable direct vat set liquid starter culture and a method of preparation thereof" (Application No. 202411024415) by Pradip Behare.

Patent Granted

Four Indian patents were granted to ICAR-NDRI, Karnal from January to March, 2024.

1) The first Indian patent (# 502210) was granted on January 23, 2024 for the innovation entitled "A biopolymer based electrospun Oxygen indicator for Dairy Products Packing" filed on June 22, 2018 (Application No. 201811023361) by a team of scientists comprising Narender Raju Panjagri, Shivam Panwar, Ashish Kumar Singh, Prashant Saurab Minz, Richa Badola and Gaurav Kr Deshwal.


INTELLECTUAL PROPERTY INDIA
क्रम सं/SL No :011194130
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पेटेंट प्रमाण पत्र | Patent Certificate
(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 502210
आवेदन सं. / Application No. : 201811023361
फाइल करने की तारीख / Date of Filing : 22/06/2018
पेटेंटी / Patentee : INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)
आविष्कारकों का नाम /Name of Inventor(s) : 1.DR. NARENDER RAJU PANJAGARI 2.MR. SHIVAM PANWAR 3.DR. ASHISH KUMAR SINGH 4.ER. PRASHANT SAURABH MINZ 5.DR. RICHA BADOLA 6.MR. GAURAV KR. DESHWAL

It is hereby certified that a patent has been granted to the patentee for an invention entitled *A PROCESS FOR THE PRODUCTION OF A BIOPOLYMER-BASED ELECTROSPUN ULTRAVIOLET LIGHT ACTIVATED OXYGEN INDICATOR* as disclosed in the above mentioned application for the term of 20 years from the 22nd day of June 2018 in accordance with the provisions of the Patents Act,1970.

Date of Grant : 23/01/2024
Controller of Patents

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 22nd day of June 2020 and on the same day in every year thereafter.

Granted Patent: A biopolymer based electrospun Oxygen indicator for Dairy Products Packing

2) The second Indian Patent (# 504293) was granted on January 29, 2024 for the innovation entitled "A process for production of antimicrobial coagulant formulation for making extended shelf-life paneer" filed on February 23, 2021 (Application No. 202111007461) by a team of scientists comprising Pradip Vishnu behare, Rallapalli Vembar Rajanikar, Sudhir Kumar Tomar, Diwas Pradhan, Rajan Sharma and Sanket Borad.


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(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 504293
आवेदन सं. / Application No. : 202111007461
फाइल करने की तारीख / Date of Filing : 23/02/2021
पेटेंटी / Patentee : INDIAN COUNCIL OF AGRICULTURAL RESEARCH
आविष्कारकों का नाम /Name of Inventor(s) : 1.PRADIP VISHNU BEHARE 2.RALLAPALLI VEMBAR RAJANIKAR 3.SUDHIR KUMAR TOMAR 4.DIWAS PRADHAN 5.RAJAN SHARMA 6.SANKET BORAD

It is hereby certified that a patent has been granted to the patentee for an invention entitled *A PROCESS FOR PRODUCTION OF ANTIMICROBIAL COAGULANT FORMULATION FOR MAKING EXTENDED SHELF-LIFE PANEER* as disclosed in the above mentioned application for the term of 20 years from the 23rd day of February 2021 in accordance with the provisions of the Patents Act,1970.

Date of Grant : 29/01/2024
Controller of Patents

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 23rd day of February 2023 and on the same day in every year thereafter.

Patent Granted: A process for production of antimicrobial coagulant formulation for making extended shelf-life paneer

3) The third Indian Patent (# 511469) has been granted on February 16, 2024 for the innovation entitled "Construction of mutant strain for enhanced galactose utilization" filed on August 31, 2017 (Application No. 201711030808) by a team of scientists comprising Shilpa Viz, Arun Beniwal, Priyanka Saini and Sachinandan De.


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(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 511469
आवेदन सं. / Application No. : 201711030808
फाइल करने की तारीख / Date of Filing : 31/08/2017
पेटेंटी / Patentee : INDIAN COUNCIL OF AGRICULTURAL RESEARCH
आविष्कारकों का नाम /Name of Inventor(s) : 1.DR. SHILPA VIJ 2.DR. ARUN BENIWAL 3.DR. PRIYANKA SAINI 4.DR. SACHINANDAN DE

It is hereby certified that a patent has been granted to the patentee for an invention entitled *CONSTRUCTION OF MUTANT STRAIN OF KLUYVEROMYCES MARXIANUS FOR ENHANCED GALACTOSE UTILIZATION* as disclosed in the above mentioned application for the term of 20 years from the 31st day of August 2017 in accordance with the provisions of the Patents Act,1970.

Date of Grant : 16/02/2024
Controller of Patents

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 31st day of August 2019 and on the same day in every year thereafter.

Patent Granted: Construction of mutant strain for enhanced galactose utilization

4) The fourth Indian Patent (# 516796) has been granted on February 28, 2024 for the innovation entitled "Design and development of nanofluid based extended surface module for milk cooling" filed on June 8, 2018 (Application No. 201811021472) by a team of scientists comprising Ravi Prakash, Chikkamutharayappa Manjunatha, Guruvanna Mahesh Kumar, KerekoppaPuttaaiah Bhatta Ramesha, GiriyapuraBasavarajappa Darshan and Menon Rekha Ravindra.


पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India
पेटेंट प्रमाण पत्र | Patent Certificate
पेटेंट सं. / Patent No. : 516796
आवेदन सं. / Application No. : 201811021472
भरण करने की तारीख / Date of Filing : 08/06/2018
पेटेंटी / Patentee : Indian Council of Agricultural Research
It is hereby certified that a patent has been granted to the patentee for an invention entitled "DESIGN AND DEVELOPMENT OF NANOFLUID BASED EXTENDED SURFACE MODULE FOR MILKCOOLING" disclosed in the above mentioned application for the term of 20 years from the 8th day of June 2018 in accordance with the provisions of the Patents Act,1970.
Date of Grant : 28/02/2024
By Order
Controller of Patents

Patent Granted: Design and development of nanofluid based extended surface module for milk cooling

Technologies Transferred

Nine technologies were commercialized to Hatsun Agro Product Ltd., Chennai during the technology transfer event held on January 4, 2024. The technologies transferred were as follows:

1) A new rapid test for detection of detergent in milk
2) A new strip-based test for detection of neutralizers in milk
3) A new strip-based test for detection of urea in milk
4) Strip-based test for detection of glucose in milk
5) Strip-based test for detection of hydrogen peroxide in milk
6) Strip-based test for detection of maltodextrin in milk
7) A strip-based test for detection of sucrose in milk
8) Strip for detection of sodium chloride in milk
9) Paper-based strip for the rapid detection of formalin in milk

Transfer of 09 Technologies titled "Rapid Test for detection in Milk Technologies" to Hatsun Agro Product Ltd., Chennai on January 4, 2024

EVENTS

1) **Dairy Mela-2024:** ICAR-National Dairy Research Institute organized a three-day Dairy Mela and Agricultural Exhibition during March 9-11, 2024 at Khuntakatti Maidan, Chaibasa, West Singhbhum, Jharkhand. Inaugurated by Honorable Union Agriculture and Farmers Welfare Minister, Shri Arjun Munda, the event showcased the exemplary development and extension work of NDRI, Karnal. Honorable Union Minister also emphasized the need for improved breeds to boost milk production in Jharkhand and praised India's leading position in milk production due to efforts of NDRI. He encouraged young farmers to adopt dairy entrepreneurship, aligning with Prime Minister Narendra Modi's vision of a 'Developed India' by 2047, where agricultural technologies reach every farmer to enhance income and sustainability. Dr. Dheer Singh, Director, ICAR-NDRI, Karnal highlighted the potential of innovative agricultural technology to revolutionize livestock production

and dairy processing. The exhibition featured 50 stalls displaying technologies from various research institutes and district-level departments, including Horticulture, Animal Husbandry, Agriculture, NABARD Bank, Sericulture, Irrigation, and Women and Child Development. The event included a beauty contest for dairy animals, an animal health camp, and farmer-scientist dialogues and seminars to provide quick solutions to farming and animal husbandry queries. Over 3,000 participants, including cattle rearers, farmers, input dealers, entrepreneurs, students, and government and non-government officers, attended the fair. Tribal farmers, participating under the Scheduled Tribe Sub-Plan, competed and were awarded for their agricultural product displays. The Dairy Mela demonstrated NDRI's commitment to advancing agricultural and animal husbandry practices, aiming for the all-around development of livestock and agriculture in the tribal region.

During Dairy Mela and Agricultural Exhibition at Khuntakatti Maidan, Chaibasa, West Singhbhum, Jharkhand

2) The 20th Convocation ceremony of the National Dairy Research Institute (NDRI) was held on March 15, 2024 at the Dr. D. Sundaresan Auditorium. The occasion was graced by Padma Bhushan awardee and former Director General of the Indian Council of Agricultural Research (ICAR), Dr. R. S. Paroda, along with Dr. Dheer Singh, the esteemed Director and Vice-Chancellor of ICAR-NDRI Karnal. Dr. Paroda conferred degrees to a distinguished cohort of 278 students, which included 49 BTech graduates, 127 master's degree recipients, and 102 researchers. In his address, Dr. Paroda praised the relentless efforts of NDRI, highlighting its longstanding position as the premier institution among all ICAR deemed universities, and inspired the graduates to uphold the institute's legacy of excellence and innovation in agricultural sciences. Dr. Dheer Singh emphasized the institute's use of cutting-edge technologies to enhance the multiplication of elite germplasm for producing superior breeds of cattle and buffaloes. He encouraged the graduates to embrace entrepreneurship and become innovators rather than merely seeking employment. Dr. M.S. Chauhan, Vice-Chancellar, G. B. Pant University of Agriculture and Technology, Patnagar was Guest of Honour.

Distribution of Degree certificates by Chief Guest & other dignitaries during the 20th Convocation at ICAR-NDRI, Karnal

3) A 21 day national training program on "Emerging engineering and technological interventions in processing and value addition of milk products" took place from January 10-30, 2024. Sponsored by the Agricultural Education Division, ICAR, New Delhi, and organized by the Dairy Engineering Division under the Centre of Advanced Faculty Training (CAFT) in Dairy Processing, the program welcomed twenty participants, all Assistant Professors and above, from across the country. Dr. Sushil Kumar, Former Director ICAR-NDRI, and Dr. Dheer Singh, Director and Vice-Chancellor, ICAR-NDRI, Karnal, graced the inaugural function. Experts covered topics such as dairy technology trends, automation, nanotechnology and data analysis. Visits to Verka dairy plant and online lectures by international experts enriched the participants' understanding. Dr. Ashish Kumar

Singh and Dr. Rajan Sharma distributed completion certificates during the valedictory function.

Inaugural Session of the training

Valedictory Function of the training

4) On March 1, 2024 a Innovation and Creativity Contest in Dairying, Animal Sciences, and Allied disciplines took center stage, organized under the Agri Business Incubation (ABI) Centre at ICAR-NDRI. This illustrious event was a highlight of the Academic Fortnight-2024, showcasing ingenuity and brilliance. Invitations were extended to students ranging from undergraduates to doctoral candidates across fourteen thematic areas, encompassing research ideas and business ideas. From a plethora of submissions, seventeen exceptional applications were meticulously curated for presentation before a discerning selection committee. During the 20th Convocation of ICAR-NDRI, the two most outstanding ideas in each category were honoured with prestigious prizes, marking a pinnacle of achievement. The seamless organization of this event was skillfully managed by the esteemed triumvirate of Drs. D. N. Yadav, A. K. Dixit and S. A. Hussain, ensuring its resounding success.

5) A Memorandum of Understanidng (MoU) was signed on February 9, 2024 between ICAR-NDRI and Garden City University (GCU) in a ceremony held at GCU campus, Bengaluru. As per the MoU, SRS-ICAR-NDRI will offer internship/ training program/ certificate course to M.Sc., Microbiology students of GCU every year, for a period of five years.

MoU exchange ceremony between ICAR-NDRI and GCU, Bangaluru

6) The 48th meeting of Board of Management of ICAR-National Dairy Research Institute, Karnal held under the Chairmanship of Dr. Dheer Singh, Director, ICAR-NDRI, Karnal on March 14, 2024 at NDRI Premises in Hybrid Mode. The Director made a brief presentation on major research activities and achievements of the Institute. All the members expressed their satisfaction on the research activities of the Institute and also appreciated the achievements in various fields like protection of IPR, technology commercialization, imparting trainings to various stakeholders and extension activities. Sh. B. D. Phansal, Joint Director, Administration/ Senior Registrar & Member Secretary, BoM presented the agenda for discussion in the meeting.

48th Board of Management Meeting

7) During January to March, 2024 four field visits were conducted, benefiting a total of 91 farmers.

8) Three animal health camps were organized in the adopted villages, with participation from 178 farmers and their animals.

9) One Farmers-Scientists interaction meeting was held, actively involving 13 farmers.

10) A total of 60 visits were arranged at the ICAR-NDRI, Karnal, where 4269 farmers, students, entrepreneurs, and other stakeholders visited the institute.

EXTENSION

Krishi Vigyan Kendra

- Krishi Vigyan Kendra (KVK) organized the **46th Scientific Advisory Committee** SAC meeting of KVK, Karnal under the chairmanship of Director, ICAR-NDRI, Karnal in off-line and on-line mode at Pinaki Hall of ICAR-NDRI, Karnal on January 12, 2024. The meeting was attended by 42 participants.

Scientific Advisory Committee of Krishi Vigyan Kendra

- KVK organized an elocution and painting competition at the Government Senior Secondary School in Kalron village on February 8, 2024, aiming to foster mass awareness against Crop Residue Management, drawing the participation of 132 students. During the event, students showcased their creativity through environmentally pertinent drawings depicting various aspects of crop residue management, while a lecture highlighting the utilization of diverse machinery was also imparted.

- KVK organized a field visit on wheat crop under Natural Farming on February 9, 2024 at village-Tikri. Experts from KVK delivered lectures on various aspects of Natural Farming and attended by 05 farmers and KVK staff. Further, the importance of chemical-free farming was discussed.

Elocution and painting competition organized by Krishi Vigyan Kendra, NDRI, Karnal

Awareness program on crop residue management

- KVK organized a field visit on the Frontline Demonstration of the new variety of Berseem BL-44 on February 16, 2024 at village Kamalpur Roran, attended by two farmers and KVK staff. The expert from KVK detailed the merits of the new variety and recorded the yield parameters of Berseem.

Field visit on Frontline demonstration

- The KVK organized a Speech and Drawing competition at the State Institute of Engineering and Technology, Nilokheri, Karnal on February 22, 2024, aimed at garnering broader awareness about 'Crop Residue Management.' Approximately 162 students and other participants engaged in a lecture, delving into innovative approaches to crop residue management.
- A Field Day showcasing Cluster Frontline Demonstrations (CFLD) focusing on mustard crops was conducted in the villages of Gagsina and Picholia on February 26, 2024 and March 19, 2024, respectively. The events included practical demonstrations of mustard crop harvesting along with an informative lecture introducing the latest variety, Radhika, to the attending farmers. A total of 62 farmers and farm women actively participated in these sessions, engaging in knowledge exchange and hands-on learning opportunities.
- KVK, Karnal organized Awareness cum Kisan Sangoshthi at KVK campus on March 21, 2024. In this event method demonstration on making of Jeeva Amrit, Beejamrit and other inputs were shown to farm women under Out-scaling of Natural Farming. About 72 farm women and others participated in this event.
- KVK organized the Swachhta program "Microorganism based agricultural waste management training and demonstration program" at village Manglora, Karnal on March 27, 2024. In this event, 68 farm women and others participated.

Microorganism-based Agricultural Waste Management Training and Demonstration

- During the period of January to March, 2024, KVK organized 19 exposure visits for 628 participants and conducted seven on-campus training sessions focusing on scaling up nature farming, benefiting 229 farmers.

Training on Out Scaling of Natural Farming

- The KVK, ICAR-NDRI, organized agricultural drone demonstrations across multiple villages in Karnal district to promote the adoption of cutting-edge technologies among farmers. Throughout this initiative, a total of 57 drone demonstrations were conducted, covering 42 hectares across various

villages in Karnal district and engaging a total of 918 participants.

Agri-Drone Demonstrations at Farmers Field

- The KVK actively engaged in the Viksit Bharat Sankalp Yatra, a Government of India initiative, contributing to 24 such programs where lectures on Soil Health Card, Natural Farming, and the utilization of Agri-drones in agriculture were delivered to farmers and farm women. Across these 24 Yatras, a total of 4885 individuals participated.

Honorable MLA Mr. Harvinder Kalyan, from Gharaunda visiting the exhibition stall during Viksit Bharat Sanklap Yatra 2024

HONOURS/ AWARDS/ RECOGNITIONS

- Tehri N., Thakur G., Singh N.A., Yadav A., Kumar N., and Raghu H.V. (2022) received the Best Research Paper award in the category of "Dairy processing" for the year 2022 by the Indian Dairy Association (IDA) for the research article entitled "Protease activity as a marker of Bacillus spore germination and its utility for spore eradication." *Indian Journal of Dairy Science*, 75 (6) 522-527 during the 50th Dairy Industry Conference held during March 4-6, 2024 at Hyderabad.
- Singh, R. and Sharma, R. (2022) received Best Research Paper Award in the catagory of "Commecial Aspects of Dairying" for the year 2022 by the Indian Dairy Association (IDA) for the research article entitled "Geographical Indication for Traditional Indian Dairy Products- A Perspective" in *Indian Dairyman*. 74 (9), 88-95 during the 50th Dairy Industry Conference held during March 4-6, 2024 at Hyderabad.
- Shreya Talan, Naresh Kumar and Raghu H V received the Best Poster Award (3rd) for the poster entitled "Strip test for detection of *Listeria monocytogenes* in milk" during the 50th Dairy Industry Conference held during March 4-6, 2024 at Hyderabad.
- Dr. Writdhama Prasad was awarded Dr. C. M. Singh Best Research Paper Award for the paper 'Effect of glucan addition on complexed zinc concentration and physico-chemical attributes of buffalo milk Paneer Whey' during the National Conference on 'Enhancing Farmers Income by Livestock, Poultry and Aqua Farming through Sustainable and Eco-friendly smart technologies and practices' held at Bihar Animal Sciences University (Patna) during February 28-29, 2023.
- Arthiva K. and D. N. Das received Best Poster Presentation Award for the poster entitled "CRISPR/ Cas9 mediated editing of COX-2 gene to discern its role in prostaglandin production in buffaloes (*Bubalus bubalis*) in XXI SOCDAB National Symposium during February 15-16, 2024 at NTR Veterinary College, Gannavaram, Andhra Pradesh.

- Sonia Mor, Swarnalata, Surendra Nath and Laxmana Naik received Best Poster Presentation for the poster entitled, "Fortification of milk with nano encapsulated milk peptides." at the 50th Dairy Industry Conference, organized by Indian Dairy Association, held at Hyderabad during March 4-6, 2024.
- Dr. Ravi Prakash under the supervision of Dr. Menon Rekha Ravindra, was selected for the IAUA Award for Outstanding Ph.D. Thesis Research for the year 2023 in the category of Dairy and Fisheries Sciences. The award was presented during the IAUA Vice Chancellors' Convention held on March 17, 2024 at GADVASU, Ludhiana.
- Dr. Basavaprabhu H. N., Scientist (Dairy Microbiology), SRS-Bengaluru, has been awarded the Best PhD thesis award (Dairy Processing group) with the Director's Medal in the 20th convocation of ICAR-NDRI (Deemed University) on March 15, 2024.
- Dr. Basavaprabhu H. N., Scientist (Dairy Microbiology), SRS-Bengaluru, has been awarded Merit Certificate for academic excellence in Dairy Microbiology during the doctoral degree program in the 20th convocation of ICAR-NDRI, Karnal (Deemed University) on March 15, 2024.
- Anu Joshi, Sanchita Garai, Sanjit Maiti, Siddhesh Zade received "Best Poster Award" for the paper entitled "Climate change and agro-ecosystem: threats, opportunities and solutions" in 11th National Seminar on "Transformative Agriculture and Sustainable Development: Re thinking Agriculture for Changing World" organized by Society for Community Mobilization for Sustainable Development, New Delhi in collaboration with Maharana Pratap University of Agriculture and Technology, Udaipur during March 5-7, 2024.

PERSONALIA

Training/ Seminar/ Symposium attended

- **Dr. Khushbu Kumari**, Scientist (SS) attended 21 Days National Training Program entitled "Emerging Engineering and Technological Intervention in Processing and Value Addition of Milk Products" during January 10-30, 2024 at Dairy Engineering Division, ICAR-NDRI, Karnal under the aegis of CAFT.
- **Dr. Diwas Pradhan**, Scientist attended and delivered an invited talk at the International Conference on Advances in Biological Sciences for Sustainable Development (ICABSSD 2024) on March 2, 2024, at the Central University of Jammu, Jammu.
- **Dr. Basavaprabhu H. N.** completed three months of professional attachment training at ICAR-NIVEDI, Bengaluru on February 29, 2024.
- **Dr. D. N. Das** attended Online Training on Decoding Genomics and Proteomics data using Machine Learning Approach during February 21-27, 2024.

Joining/ Promotions/ Transfers/ Retirements

- **Dr. Raman Seth,** Principal Scientist (Dairy Chemistry) superannuated from active services of ICAR on February 29, 2024.
- **Dr. Ravinder Malhotra,** Principal Scientist (Agricultural Statistics) superannuated from active services of ICAR on February 29, 2024.
- **Mr. Bhim Singh,** T-1 superannuated from active services of ICAR on February 29, 2024.

राजभाषा एकक

संस्थान राजभाषा कार्यान्वयन समिति की बैठक

भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की राजभाषा कार्यान्वयन समिति की दिनांक 24.01.2024 को संपन्न हुई 102वीं समीक्षा बैठक का कार्यवृत्त

डा. धीर सिंह, निदेशक, भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की अध्यक्षता में संस्थान राजभाषा कार्यान्वयन समिति की 1 जनवरी से 31 मार्च, 2024 तक की 102वीं तिमाही समीक्षा बैठक दिनांक 24.01.2024 को अपराह्न 3:30 बजे के साथ संस्थान के पिनाकी में आयोजित की गयी। बैठक में संस्थान के 33 वरिष्ठ पदाधिकारी शामिल हुए।

संस्थान राजभाषा कार्यान्वयन समिति की तिमाही बैठक (24.01.2024) की झलक

बैठक के आरंभ में सदस्य–सचिव, श्री धीरज शर्मा ने सभा कक्ष में उपस्थिति समिति के अध्यक्ष तथा अन्य सदस्यों का स्वागत किया तथा सभा को अवगत कराया एवं साथ ही बैठक की कार्यसूची 37 बिन्दुओं जिस पर परिषद कार्यालय से जोर देने के लिए कहा गया पर भी विस्तार से चर्चा की।

हिन्दी कार्यशाला का आयोजन

संस्थान के डा. एन. एन. दस्तूर सभागार में दिनांक 5.3.2024 को (राजभाषा हिन्दी नियम एवं अधिनियम, अपनी हिन्दी सुधारें एवं हिन्दी की तिमाही रिपोर्ट भरने में आने वाली समस्याओं का निराकरण) हिन्दी कार्यशाला का आयोजन किया गया जिसमें संस्थान के 44 वैज्ञानिक, अधिकारी एवं कर्मचारी शामिल हुए।

SOUTHERN CAMPUS, BENGALURU

EXTENSION

Farmer First Project

Under the Farmer First Collaborative Project between IIHR Bengaluru and SRS of ICAR-NDRI, Karnal a one-day Exposure cum On-Campus training program on 'Good Dairy Management Practices and Value Addition' was held on March 20, 2024 at SRS of ICAR-NDRI, Karnal. The program aimed to benefit farm families, focusing on various areas such as balanced feeding, cattle health, and milk quality. Subject matter specialists sensitized sixty farmers and farm-women beneficiaries from project villages on profitable dairy farming and value-added product preparation. Interactive sessions with experts and practical demonstrations at the livestock research centre and experimental dairy plant enriched

participants' understanding, fostering improved dairy management practices and product diversification.

Exposure Training Program

A one-day Exposure cum Training program welcomed 172 farmer trainees from various districts of Tamil Nadu, representing farmers, farm women, and farm youth. Organized under the 'Support to State Extension Programs for Extension Reforms' (SSEPERS) via the Agricultural Technology Management Agency (ATMA) scheme, the event aimed to educate participants on quality milk production, green fodder cultivation, and dairy animal healthcare. Faculties delivered lectures in the local language, followed by interactive sessions with subject matter specialists addressing dairy-related challenges. Farmer trainees also visited a Livestock Research Centre and an Experimental Dairy Plant for practical insights, enhancing their understanding of dairy farming practices.

Exposure-cum-Training program

Exhibition Participation

The SRS of ICAR-NDRI, Karnal participated in the National Horticultural Fair 2024 held during March 5-7, 2024 at IIHR, Hesaraghatta, Bengaluru, organized by ICAR-IIHR, in collaboration with the Society for Promotion of Horticulture (SPH) and BESST- HORT, a Technology Business Incubator of ICAR-IIHR Bengaluru. The event was an opportunity to showcase institute activities, technologies and need-based knowledge sharing for the benefit of the farming community of the Southern region. SRS-NDRI stall presented updated technical know-how from dairy production and processing for the benefit of the farming community, with a stall visit profile of 1500 comprising farmers, entrepreneurs, research scholars and students from the State and neighbouring states.

Exhibition Stall at National Horticultural Fair 2024 at Bengaluru

Animal Health Camp Organised Under Tsp

Under the TSP program, the Animal Health cum Infertility camp was organised in collaboration with KOCHIMUL and State DAH&VS, under the TSP program at Pingyanalli village of Chikkaballapur district of Karnataka state. A total of 81 dairy animals were attended in the animal health camp which included 54 HF cross-bred animals, 6 buffaloes, 12 heifers and 9 calves, for the problems of infertility issues, mineral deficiency, mastitis, wounds & worms. Corrective measures comprised the distribution of inputs, mineral mixture supplements, preventive and curative medicines for infertility, mastitis and wounds, and dewormers for the healthcare of the dairy cattle, to benefit beneficiary farm families of the adopted village. During the program, farmers' interaction meetings with the experts were also organized to sensitize the farmers about improved dairy management practices.

Animal Health Camp at Pingyanalli village

Training Program Organized Under TSP

The Farmers Training program on 'Scientific Dairying and Milk Processing' was organized on March 18, 2024 at SRS of ICAR-NDRI, under the TSP Program. The one-day on-campus training programme was well attended by 96 target beneficiaries belonging to the ST community from the adopted villages of Chikkaballapur District of Karnataka

State. The faculties of SRS, NDRI trained the dairy farmers on various aspects of scientific dairy farming practices including scientific breeding and reproduction management, balanced feeding, silage making, green fodder cultivation practices and health management besides value addition to milk and milk products and also about quality milk production practices to be adopted at farm level. During the program farmers were provided with critical inputs like CoFS-31 Fodder Seeds, Mineral Mixtures and Teat tip cups and Solutions were distributed to the beneficiary farmers. Further, the farmers were taken around the Livestock Research Center to apprise them about the improved practices and to witness the demonstration of machine milking and clean milk production practices.

Participants from one day training program at Chikkaballapur district of Karnataka State

Hands-On-Training on the Production and Characterization of Milk-Derived Bioactive Compounds using Advanced Instruments, Sponsored by SERB

The 10-day hands-on training, supported by SERB DST, aimed to equip final-year B.Tech., Masters, and PhD students in Dairy Science with skills in producing and characterizing milk-derived bioactive compounds. Twenty-six participants, including Ph.D. and M.Tech. students, attended lectures and practical sessions covering advanced instruments like FTIR, DSC, and HPLC, and analyzed bioactive components such as peptides and phospholipids. An industrial visit to ID Foods, Bengaluru, provided practical insights. The program concluded on March 6, 2024, with the distribution of training certificates and a compendium to all participants, fostering practical knowledge and skill development in the field.

Participants from ten day training program at SRS-NDRI, Bengaluru

EASTERN CAMPUS, KALYANI

EXTENSION

Training programs organized under TSP project

- A training program was conducted during February 7-9, 2024, to enhance the skills and knowledge of tribal farmers in animal husbandry and livestock management, focusing on 'Scientific Animal Husbandry Practices and Clean Milk Production.' The program attracted 30 participants, including 6 men and 24 women. It covered a comprehensive range of topics such as modern techniques for animal management, hygiene practices in milk production, and methods for ensuring the quality and safety of dairy products.

Interaction of experts and participants in training

- A training program was conducted during February 7-9, 2024, to enhance the skills and

knowledge of tribal farmers in animal husbandry and livestock management, focusing on 'Scientific Animal Husbandry Practices and Clean Milk Production.' The program attracted 30 participants, including 6 men and 24 women. It covered a comprehensive range of topics such as modern techniques for animal management, hygiene practices in milk production, and methods for ensuring the quality and safety of dairy products.

A group picture of the training particpants

- During March 6-8, 2024 a training program was organized to address 'Health Management of Livestock.' The program focused on the health and well-being of livestock, emphasizing disease prevention, treatment protocols, and overall herd management practices. The participation of 27 women highlights their strong interest and engagement in livestock health management activities.

A group picture of the training particpants

- A training program entitled 'Scientific Animal Husbandry for NEH Farmers of Tripura State' was organized during March 12-15, 2024 to equip 15 participants (13 men and 2 women) with modern animal husbandry techniques. The program focused on addressing the unique needs of farmers in Tripura, covering animal health management, breeding, nutrition, hygiene, and farm management. Through hands-on learning and expert-led sessions, the initiative aimed to enhance livestock productivity and contribute to agricultural development in the region.

A group picture of the training particpants

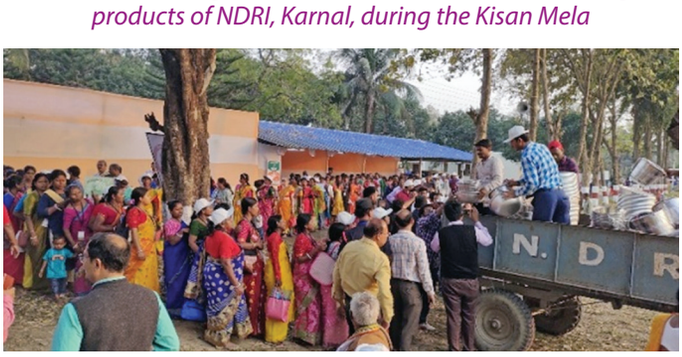
- Activities undertaken under TSP project: The ERS of ICAR-NDRI participated in the Regional Agricultural Fair for the Eastern Region-2024 at KVK Khunti, Jharkhand, during February 3-5, 2024. The institute's exhibition stall showcased ERS technologies and attracted significant attention, including visits from the Union Minister of Agriculture, Sh. Arjun Munda and the Director General of ICAR, Dr. Himanshu Pathak. Led by the Director of ICAR-NDRI, Karnal, the stall disseminated crucial dairy farming information and distributed 100 quintals of goat feed, 400 packets of mineral mixture, veterinary medicines, and 400 steel buckets and aluminum tumblers to tribal farmers.

Union Ministor of Agriculture and Farmers welfare visiting the exbibition stall

- On March 2, 2024, the ERS of ICAR-NDRI, Karnal organized a Kisan Mela under the Tribal Sub-Plan Project (TSP) with the goal of uplifting tribal communities in agriculture and allied sectors. Approximately 500 participants, predominantly tribal farmers, participated, facilitating knowledge exchange and collaboration. The event featured 12 exhibition stalls showcasing innovative agricultural

technologies, attracting diverse stakeholders, including representatives from ICAR institutes, Farmer Producer Organizations (FPOs), and Krishi Vigyan Kendras (KVKs). Indigenous animal breeds were highlighted, emphasizing the importance of preserving tribal heritage in agriculture. A pivotal element was the farmers-scientists interaction session, fostering dialogue on sustainable farming practices and technological interventions suited to tribal contexts. Additionally, essential inputs such as mineral mixtures, veterinary medicines, steel buckets, and aluminum tumblers were distributed among 333 tribal farmers present, aiming to boost their agricultural productivity and livelihoods.

Union Minister of Agriculture and Farmers welfare checking the products of NDRI, Karnal, during the Kisan Mela



Distribution of material at Kisan Mela

- **Activities undertaken in NEH states:** The ICAR-National Dairy Research Institute, Eastern Regional Station, Kalyani, Nadia, West Bengal, organized a program titled "Livelihood Improvement of NEH Farmers through Livestock Interventions" during February 21-22, 2024, in Dhubri, Assam. Dr. T. K. Dutta, Dr. S. K. Das, Dr. D. K. Mandal, and Dr. A. Chatterjee collaborated with KVK, Dhubri, Assam, for the event. The program aimed to uplift socio-economic conditions through livestock improvement. Scientific dairy farming, nutritional management, and poultry rearing were discussed. Inputs like goats, chicks, piglets, poultry feed, and medicines were distributed among 200 farmer beneficiaries. Similarly, during March 13-14, 2024, a similar program was conducted in Bagma, Udaipur, Gomati district, Tripura, focusing on scientific livestock rearing and disease management.

Distribution of animal husbandry inputs at Dhubri, Assam

Distribution of animal husbandry inputs at Bagma, Tripura

- **Dr. Himanshu Pathak inaugurated New Agricultural Facilities at KVK (Additional), Nadia:** Dr. Himanshu Pathak, Secretary DARE & DG, ICAR, inaugurated new facilities at Krishi Vigyan Kendra (Additional) Nadia, marking a pivotal moment in agricultural development held on March 31, 2024 at ERS of ICAR-NDRI campus, Kalyani, West

Unveiling the new facilities at KVK Nadia by Dr. Himanshu Pathak

Bengal, the event unveiled administrative and farmer hostel facilities, underscoring a collective commitment to advancing agricultural practices. Esteemed dignitaries, including Dr. Dheer Singh, VC & Director, ICAR-NDRI, and Dr. Raghavendra Bhatta, DDG (AS), ICAR, graced the occasion. Dr. Pathak expressed optimism about the center's transformative role in serving Nadia district's farming community. Future plans of ICAR for scientific advancements in agriculture were also shared, emphasizing a dedication to assisting economically disadvantaged farmers and promoting sustainable methodologies. The inauguration symbolized a commitment to agricultural prosperity, reflecting ICAR's unwavering support for farmers and advancement of practices across the region. These new facilities hold promise as hubs for knowledge dissemination and transformative change in Nadia's agricultural landscape.

Unveiling the administrative block by Dr. Himanshu Pathak

Unveiling the farmer hostel facilities by Dr. Himanshu Pathak

A visit to ERS of ICAR-NDRI by Dr. Himanshu Pathak

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