राडेअनुसं समाचार

NDRI News

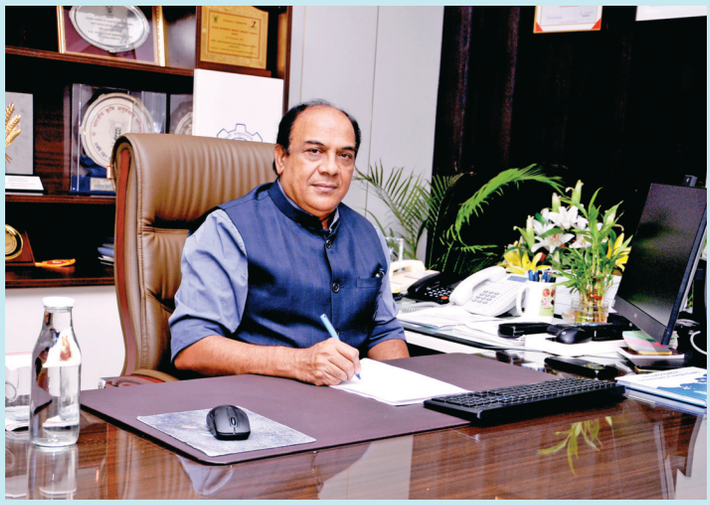
राष्ट्र के डेरी स्वप्नों को समर्पित
Fulfilling Nation's Dairy Dreams

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

www.ndri.res.in

Volume 30 No. 1 | April - June, 2025

From the Director's Desk



Greenhouse gas (GHG) emissions remain one of the most widely discussed global issues of our time. Since the pre-industrial era, surface air temperatures have increased significantly, with the average land temperature for 2006–2015 standing 1.53°C higher than the 1850–1900 baseline (IPCC, 2019). This rise, primarily driven by anthropogenic emissions since the Industrial Revolution, is referred to as global warming and is a direct result of GHGs trapping more sunlight and heat within the atmosphere. The intensification of this effect has led to notable and persistent changes in global climate patterns—alterations in temperature, precipitation, and wind patterns that typically span decades.

While Earth's climate system has evolved over millions of years and remains influenced by major natural factors, recent rapid industrial development, deforestation, advances in agricultural practices (including livestock rearing), and other human activities have accelerated changes in the climate at an unprecedented rate.

In India, agriculture accounts for approximately 14% of total GHG emissions as of 2020, with livestock contributing 60% of this share. Specifically, livestock are responsible for 10,601 Gg (1 Gg = 10^9g) of methane emissions from enteric fermentation, 184 Gg of methane, and 30 Gg of nitrous oxide from manure management, totaling nearly 309,868 Gg CO_2-equivalent emissions from the sector. Within these figures, cattle contribute about 55.8%, buffaloes 34.6%, sheep 2.9%, goats 6.3%, and other species (such as yak, mithun, camel, horse, mule, and pig) 0.3%. From 2005 to 2020, GHG emissions from livestock have grown at an annual growth rate (AGR) of 0.5%, while livestock population increased by 0.7% and milk production surged by 8.31%. This clearly indicates that, despite a substantial rise in milk production, GHG emissions from livestock have remained nearly constant, resulting in a notable decline in per capita emissions for milk production.

State-wise analysis of enteric methane emissions in 2020 reveals that 11 states—Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, Bihar, Maharashtra, West Bengal, Karnataka, Tamil Nadu, Punjab, and Jharkhand—contribute around 78% of total livestock emissions, with Uttar Pradesh alone accounting for about 20%, followed by Rajasthan (9.95%) and Madhya Pradesh (8.55%).

As a national institute, the ICAR-NDRI is dedicated to both quantifying emissions and developing solutions. Our research focuses not only on determining country-specific emission factors for large ruminants (using respiration chambers and SF_6 techniques) and preparing the national GHG inventory for submission to the Ministry of Environment, Forest and Climate Change (MoEF&CC) and the UNFCCC, but also on developing mitigation strategies in pursuit of India's net-zero ambition by 2070. Our team has made significant progress in developing feed additives that have the potential to reduce

In this issue...

enteric methane emissions by 20–40%. Field trials are underway to assess the effectiveness of climate-resilient technologies developed by NDRI, with a focus on upscaling for small and marginal farmers.

Additionally, infrared thermography is being used to monitor the body surface temperature of animals in relation to thermal stress, helping to identify interventions that maintain the productivity of dairy animals. We are also investigating molecular mechanisms and transcriptomic pathways to assess breed suitability for specific regions or for relocating milk production beyond traditional home tracts.

ICAR-NDRI is proud to lead the preparation of India's national GHG inventory from the livestock sector, contribute to national and international reporting, advance mitigation strategies through dietary interventions, and enhance our understanding of thermal stress and its management at the molecular level—all in alignment with our commitment to achieving net-zero targets in the livestock sector by 2070.

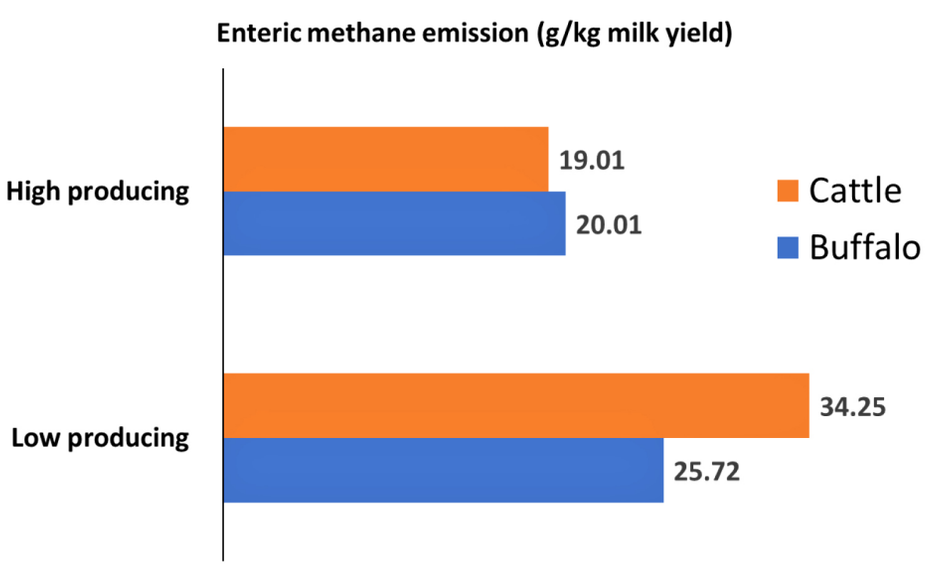
(Dheer Singh)
Director & Vice-Chancellor
ICAR-NDRI, Karnal

RESEARCH

Comparative enteric methane emission in low and high producing crossbred cows and buffaloes

Rahul Singh Chandel, Vivek Chandapure, Prasanth M Nair & Goutam Mondal

Low-producing and high-producing dairy cows and buffaloes, varied in feed intake, milk production, and feed efficiency resulting in variation in enteric emission. Low producing Karan Fries cows (milk yield <8 kg/day) emitted an average of 102.44 g methane/day, as compared to their high-producing counterpart (>12 kg/day) that emitted substantially more methane at 212.66 g/day. Low producers had lower emissions (16.47 g/kg DMI) compared to high producers (19.44 g/kg DMI). However, the methane emissions per kg of milk showed an inverse pattern, with low producers emitting more methane per unit of milk (34.25 g/kg milk) than high producers (19.01 g/kg milk). Similarly, in buffaloes, absolute enteric emission was 15.67 g/d for low-producing animals and 200.57 g for high-producing animals. Methane yield was 9.88 g/kg DMI in low producers and 14.67 g/kg DMI in high producers, indicating that high-yielding buffaloes produced more methane per unit of feed consumed. However, when methane emissions were expressed relative to milk output, low-producing buffaloes emitted 25.72 g methane per kg of milk, while high producers emitted only 20.01 g/kg milk. This finding suggests that, with higher milk production, dairy animals produce more methane, though, per unit of milk production they will emit less methane.



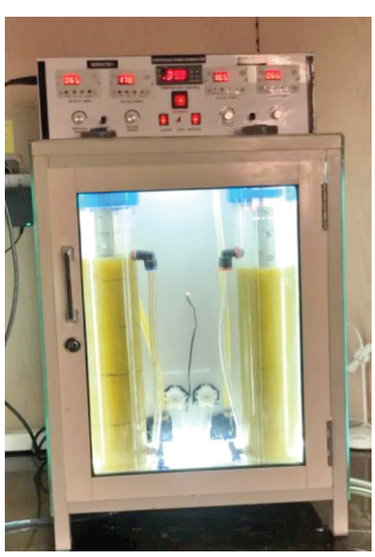
Comparative assessment of enteric methane emissions from low and high yielding dairy animals

Development and Evaluation of Continuous Rumen Bio-Reactor for Estimation of Methane Emissions

Harneet Kour and Raman Malik

This study was aimed to develop and evaluate a continuous rumen bioreactor (CRB) to replicate rumen fermentation under controlled conditions for extended durations. The system comprised two 2.5 L bioreactors housed in a thermostatically controlled incubator (39±0.5° C). Artificial saliva (McDougall's, 1948) was delivered via peristaltic pumps while a diaphragm pump simulated rumen motility, enhancing microbial fermentation. Substrates were housed in a feed cartridge unit and replaced at standardized intervals (24, 48, and 72 hours). Chyme and gas were collected in designated vessels, and sampling ports enabled real-time analysis. A standardization trial compared CRB with *in vitro* gas production technique (IVGPT) using four fodder samples (berseem, oats, maize and sorghum). No significant differences were observed in dry matter digestibility between the systems showing CRB as a reliable alternative. Four methane inhibitors (garlic, neem, sodium nitrate and seaweed) were tested at 2% inclusion level in concentrate mixture. Garlic and neem produced higher gas volumes while sodium nitrate and seaweed reduced methane emissions to a significant ($P<0.05$) extent. Whole genome metagenomics confirmed the growth of anaerobic microbial communities over 40 days. The CRB proved economical and effective thus offering a robust platform for rumen fermentation research, microbial interactions and methane mitigation strategies in ruminants.

(a) Complete view of CRB



(b) Front compartment of CRB

(c) Rear compartment of CRB

Continuous rumen bio-reactor for estimation of methane emissions

seliNDRIx: An R package for multi-trait selection of dairy animals

T.V. Raja

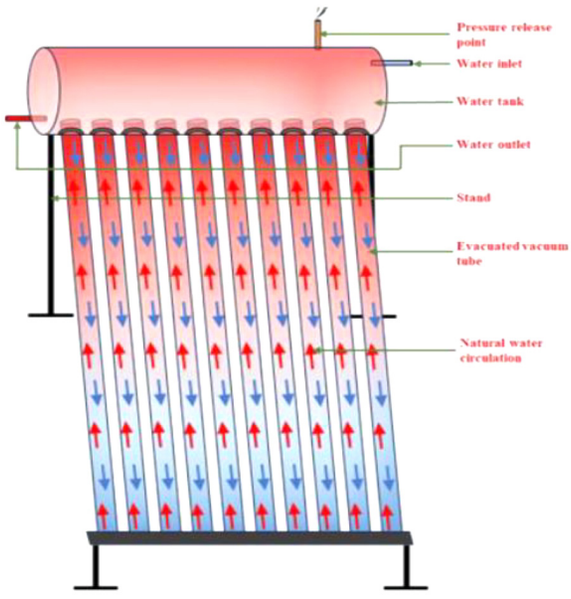
The seliNDRIx is an R package developed by the scientists of Animal Genetics and Breeding Division under the leadership of Dr. T.V. Raja. The seliNDRIx will be helpful to the researchers, academicians, students and commercial farmers. Package will be mainly used to estimate the genetic and phenotypic parameters of different traits and shall construct the selection index. The estimates include the additive genetic variances, phenotypic variances, residual variances, additive genetic variance covariance matrix, phenotypic variance covariance matrix and the additive genetic correlation matrix and phenotypic correlation matrix. From these estimates, in the second step, the index values for different traits are calculated which are used to estimate the aggregate genetic worth for each animal. The accuracy, reliability and the genetic gain for one round of selection will also be presented. In the third step, based on the aggregate index values, top 20% of the animals are listed and saved in a separate file into the folder from where the input dataset was read. seliNDRIx provides a complete suite of analysis to identify and list the genetically

superior animals. This package perform the least squares analysis and can handle both mixed and random sire models with any number of fixed factors for any number of traits.

Design of evacuated tube-type solar water heater to supply thermal energy to PCM based energy storage module

Chitranayak, J K Dabas

A thermal storage module is developed by utilising the latent heat of phase change material (PCM). An evacuated tube-type solar water heater (SWH) is designed to supply thermal energy to PCM based energy storage module from which the energy will supply to yogurt fermentation unit for incubation process. The evacuated tube-type collector was specifically chosen over flat plate collectors because flat plate systems require an external pump for water circulation and have been shown to exhibit lower thermal efficiency compared to evacuated tube systems in multiple studies, particularly under variable climatic conditions. The capacity of the SWH will be of a 100-liter insulated storage tank coupled with ten evacuated glass vacuum tubes. The system will be mounted on a slightly elevated platform to maximize incident solar radiation, enabling optimal heating performance throughout the day.



Design of evacuated tube-type solar water heater for supplying thermal energy to thermal storage module

Institutional Technology Management Unit

Detail of Patents Filed: 02

Sl. No.	Title of Patent	Inventors	Application No. and Date of filing
1.	A process for the production of Vitamin B_{12} employing whey-based culture media and Limosilactobacillus reuteri	Pradip V. Behare, Deepa Pauly Chakiath, Manorama Kumari and Richa Singh	202511037722 on **April 18, 2025**
2	A Vitamin B_{12} rich dietary supplement and a method of preparation thereof	Devaraja H. C., Rashmi H. M., Monika Sharma, Gautam Kaul, Anjal Katiyar, Amandeep Singh, Nidawanbiang Najiar, Manoj Kumar C.T., Ashwani Koth and Arindam Dhali	202511061934 on **June 28, 2025**

Detail of Copyright Filed: 01

Sl. No.	Copyright Title	Author and Co-Author	Dairy No. and Date of filing
1.	Atlas of Socio-climatic Risk and Hotspots of Dairy Production System in Indo-Gangetic Plains of India	Sanjit Maiti, Siddhesh Zade, Amitava Panja, Sanchita Garai and Gopal Sankhala	15162/2025-CO/L on **April 21, 2025**

Detail of Technologies Commercialization: 01

Sl. No.	Name of Technology	MOU Signed Date	Licence Fee	Purchaser of the Technology
1.	Indigenous Probiotic *Limosilactobacillus fermentum* NCDC 400 strain	**June 12, 2025**	4.00 Lakhs+ 18% GST	The Rohtak Coop. Milk Producers Union Ltd., Rohtak, Haryana.

Technology transfer "Indigenous Probiotic Limosilactobacillus Fermentum NCDC 400 strain" to The Rohtak Coop. Milk Producers Union Ltd., Rohtak, Haryana on ***June 12, 2025***

EVENTS

Best Division Award Presentations

As part of the Academic Fortnight celebrations, the *Best Division Presentation* was held on **April 4, 2025**. The presentations were evaluated by an expert committee comprising of Dr. Krishna Kumar Singh, Vice-Chancellor of Sardar Vallabhbhai Patel University of Agriculture & Technology (SVPUAT), Meerut; Dr. Randhir Singh, former Assistant Director General (Agricultural Extension), ICAR and Dr. B.S. Katariya, Principal Scientist, NBAGR, Karnal based as per the laid down criteria and scores. Based on the scores awarded by the expert committee, the **Dairy Extension Division** was declared the **Best Division of the Institute**. The recognition reflects the division's excellence in academic & extension contributions and overall presentation quality.

Best Division Award presentations by Heads of Division on ***April 4, 2025***

21st Convocation of ICAR–NDRI

The 21st convocation of the ICAR–NDRI was held on **April 21, 2025**. Hon'ble Shri Shivraj Singh Chouhan, Union Minister of Agriculture and Farmers Welfare & Rural Development, Government of India, graced the occasion as the Chief Guest. Sh. Bhagirath Chaudhary, Minister of State for Agriculture and Farmers' Welfare, Government of India was Guest of Honour. During the convocation, degrees were awarded to 201 students, including 32 Undergraduate, 98 Postgraduate, and 71 Ph.D. Scholars. Notably, 98 of the graduating students were girls. Hon'ble Chief guest congratulated the students and urged them to offer their knowledge for the benefit of the farming community and the Nation. Shri Sukhbir Singh Mann, a distinguished alumnus of the ICAR-NDRI, Karnal was bestowed with *Honoris causa* degree by the university for his exemplary achievements in food and dairy processing sector and for his notable contribution in strengthening the academic infrastructure of the university. Topper students of UG, PG and Ph. D. programme received medals for academic excellence, 6 students were awarded with Best thesis prizes and another 32 students awarded for merit certificates during the convocation. Among the awardees 60% were girl students.

*Shri Sukhbir Singh Mann receiving Honoris causa degree from Chief Guest, Hon'ble Shri Shivraj Singh Chouhan, Union Minister of Agriculture and Farmers Welfare & Rural Development, Government of India on **April 21, 2025***

*Hon'ble Shri Shivraj Singh Chouhan, Union Minister of Agriculture and Farmers Welfare & Rural Development, Government of India nurturing a sapling on the occasion of 21st Convocation of ICAR-NDRI on **April 21, 2025***

Dr. Dheer Singh, Director & Vice-Chancellor felicitating Sh. Bhagirath Chaudhary, Hon'ble Minister of State for Agriculture and Farmers' Welfare, Government of India on the occasion of 21st Convocation of ICAR-NDRI on ***April 21, 2025***

World Milk Day Celebrations

ICAR-NDRI, Karnal celebrated World Milk Day on **June 1, 2025**, with the theme "*Let's Celebrate the Power of Dairy*" focused on promoting the nutritional benefits, socio-economic importance, and environmental progress of the dairy sector worldwide. Dr. Dheer Singh, Director & Vice-Chancellor, highlighted India's journey to becoming the world's top milk producer and emphasized the need for enhanced milk productivity and expanding the exports potential of Indian dairy products. Dr. J. P. Mishra, Director, ICAR- ATARI, Jodhpur was the chief guest for the event, he lauded NDRI's research and development in elite breeds, value-added products, and innovation. As part of the celebrations, an exhibition was organized at the Milk Parlour, showcasing ICAR- NDRI's technological innovations, including biodegradable trays developed from apricot kernels, adulteration detection kits, and value-added dairy products such as Joha rice-based kheer and goat milk based cottage cheese. The exhibition witnessed a footfall of over 350 visitors. A series of engaging competitions were also organized for the students to creatively express the significance of milk and dairy in daily life, sustainability, and national development. Events viz. Collage making with the theme "*Evolution of Indian Dairy Industry*"; Painting with the theme "*Zero waste dairy: Innovation*

Dr. Dheer Singh, Director & Vice-Chancellor, ICAR-NDRI, Karnal; Dr. J. P. Mishra, Director, ICAR- ATARI, Jodhpur along with faculty, staff and students on the occasion of World Milk Day Celebration on ***June 1, 2025***

and sustainability"; Turn-out with the theme "*Dairy and Non-Dairy*" were organized for the students to promote critical thinking. The event concluded with a felicitation ceremony for competition winners. The enthusiastic participation of students, faculty, researchers, and entrepreneurs underscored NDRI's sustained leadership in advancing dairy science, innovation, and sustainable development.

International Bicycle Day

ICAR-NDRI, Karnal celebrated International Bicycle Day by organising a cycle rally in a bid to promote the benefits of cycling among staff and students on **June 3, 2025**.

The event aimed to create awareness about leading a healthy lifestyle and contributing to environmental sustainability. The rally was flagged off and led by Dr. Dheer Singh, Director and Vice-Chancellor, ICAR-NDRI, Karnal who emphasised the importance of incorporating cycling into one's daily routine for physical fitness and reducing carbon footprint.

In his address, Dr. Singh, Director & Vice-Chancellor encouraged students and staff to adopt cycling not only as a means of transport but also as a step towards personal health and the institute's collective contribution towards carbon credit and environmental conservation.

Dr. Ashish Kumar Singh, Joint Director (Academic); Dr. Rajan Sharma, Joint Director (Research); and Dr. Anurag Saxena, I/C, Agronomy Section were among the participants of the rally. The event was coordinated by SUNDRI, the student council of NDRI, Karnal. SUNDRI President Prince and 140 students from B.Tech., Masters and Ph.D. programmes actively took part in the rally. The participants cycled through the campus, creating awareness about environmental conservation and healthy living. They concluded the rally by taking a pledge to protect the environment and make eco-friendly lifestyle choices.

*Dr. Dheer Singh, Director & Vice-Chancellor, ICAR-NDRI, Karnal along with other officials during International Bicycle Day on **June 3, 2025***

Viksit Krishi Sankalp Abhiyan

Dr. Dheer Singh, Director and Vice-Chancellor, ICAR-NDRI, Karnal along with Dr. Ratan Tiwari, Director, ICAR- Indian Institute of Wheat and Barley Research (IIWBR), Karnal, and Dr. Shiv Kumar Yadav, Regional Head, ICAR- IARI Regional Centre in Karnal, jointly led the Union Ministry of Agriculture's outreach programme, Viksit Krishi Sankalp Abhiyan, across various villages in Haryana during May 29 to June 12, 2025. Over a 15 days period, approximately 902 teams of scientists visited around 3,500 villages of 22 district of Haryana, directly reaching out to nearly 4.5 lakh farmers.

During the campaign, farmers shared around 10,000 suggestions and issues, which will be submitted to the Union Ministry of Agriculture, Government of India.

*Dr. Dheer Singh, Director & Vice-Chancellor, ICAR-NDRI, Karnal interacting with the farmers during Viksit Krishi Sankalp Abhiyan at village Bastara on **June 06, 2025***

The scientists educated farmers on improved crop varieties such as paddy, wheat, sugarcane, maize, and pulses. They also emphasized the judicious use of insecticides, pesticides, and fertilizers, while encouraging value addition to agricultural produce to enhance profitability. Special focus was given to promoting Direct Seeded Rice (DSR) and its high-yielding varieties-PUSA 1979 and PUSA 1985.

This initiative proved beneficial for both the scientific community and farmers. Scientists received crucial feedback on the challenges farmers face, while farmers gained valuable insights into modern agricultural techniques and research developments.

The major challenges reported by farmers included:

1) Declining interest among youth in agriculture
2) Need for affordable and easily accessible sex-sorted semen to encourage the birth of female calves
3) Lack of proper marketing avenues for honey
4) Requirement for fixed, suggested remunerative prices for milk
5) Problems with repeat breeding and missed heat cycles in livestock, leading to economic losses
6) Inadequate supply of nitrogen-based fertilizers, especially urea
7) Herbicide resistance in rice to older chemicals like Butachlor and Pretilachlor, management of Bakanae disease, poor seed germination and high weed pressure in DSR systems
8) Need for high-yielding, salt-tolerant varieties of rice, wheat, and other major crops
9) Availability of short-duration rice varieties to support crop diversification and timely sowing, and varieties suitable for natural and organic farming
10) Development of pest-tolerant fodder crop varieties to improve livestock feed security, and high-yielding varieties adapted to waterlogged conditions in stress-prone regions

*Glimpses of Krishi Sankalp Abhiyan across the districts of Haryana during **May 29 to June 12, 2025***

21 days National Training on "Hands-on CRISPR Tools in Bovines"

ICAR-NDRI, Karnal, successfully organized a 21-day National Training Programme on "*Hands-on CRISPR Tools in Bovines*" during **June 6-26, 2025**, under the sponsorship of the ICAR-National Program on Genome Editing in Livestock (NPGET). The training was aimed at building national capacity in genome editing technologies for livestock improvement. The training covered hands-on modules in sgRNA design, *in vitro* transcription, lipid-based transfection, IVF, embryo manipulation, and genome editing analysis, alongside expert lectures. A total of 15 participants, including Principal Scientists, Scientists, Assistant Professors, and project staff from leading institutions such as ICAR-Central Sheep and Wool Research Institute (Avikanagar), Guru Angad Dev Veterinary and Animal Sciences University (Ludhiana), Bihar Animal Sciences University (Patna), Tamil Nadu Veterinary and Animal Sciences University (Chennai), National Institute of Animal Nutrition and Physiology (Bengaluru), ICAR- National Research Centre on Pig (Guwahati), ICAR-Central Avian Research Institute (Izatnagar), and CCS Haryana Agricultural University (Hisar) took part in the programme. The program was inaugurated by Dr. Dheer Singh, Director and Vice-Chancellor of ICAR- NDRI, Karnal. The valedictory function featured Dr. A. K. Rawat as the Chief Guest and was attended by Dr. Rajan Sharma, Joint Director (Research), and other senior faculty members.

*Dr. Dheer Singh, Director & Vice-Chancellor along with faculty members and participants of National Training programme on Hands-on CRISPER Tools in Bovines on **June 06, 2025***

EXTENSION

Dairy Extension Division

Extension Programme Organized

- Thirteen field day programmes were organized under the Farmers FIRST project in adopted villages, benefiting around 250 farmers.
- Three animal health camps and an ecto-endo parasite control programme were held in Sultanpur, Churni, and Nagla Roran villages of Karnal district and 207 number of animals were treated.
- Nine awareness programmes on climate-resilient dairy farming were conducted in Punjab (Dhoorkot, Sukdpura, Mehal Kalan, Chhapa in Barnala district; Dudhianwala, Thatta, Rattanwabad, Kamalapur in Kapurthala district) and Haryana (Gudha and Furlak in Karnal district) and 204 dairy farmers actively participated in these programmes.

Participants of awareness programme on climate resilient dairy farming at Dhoorkot village of Punjab

Participants of awareness programme on climate resilient dairy farming at Sukdpura village of Punjab

Agro-advisory services

A total of 27 agro-advisory messages related to weather forecasting, crop and animal husbandry practices, etc. were sent to Farmers through WhatsApp groups and SMS Portal. Advisory services were also provided to the farmers for timely agricultural practices to reduce losses and minimize the input costs.

Exposure visit

ICAR-NDRI, Karnal hosted 51 educational visits, engaging 3,095 students (1,620 boys and 1,475 girls). During these visits, students were introduced to the institute's research achievements and state-of-the-art facilities.

Krishi Vigyan Kendra, NDRI, Karnal

KVK-NDRI, Karnal conducted 19 field visits under CFLD, CRM, and NFOM projects, including site selection for FLDs and OFTs in dairy and fish farming. These visits benefited 130 farmers with expert guidance.

Field visit by KVK experts under CFLD Moong Project at Asandh block

The Scientific Advisory Committee (SAC) Meeting 2024-25 of KVK, NDRI, Karnal was held on **May 15, 2025** in hybrid mode at ICAR-NDRI, Karnal, under the chairmanship of Dr. Dheer Singh, Director and Vice-Chancellor of ICAR- NDRI, Karnal and Dr. J. P. Mishra. Dr. P. K. Saraswat presented the Annual Report (2024-25) and Action Plan (2025-26). A total of 38 participants attended.

*Scientific Advisory Committee (SAC) meeting of KVK NDRI, Karnal at Pinaki Hall on **May 15, 2025***

KVK NDRI, Karnal organized visual telecasts of *Krishi Chaupal*: the 5th episode on Makhana production (**April 12, 2025**) with 81 farmers participating, and the 6th episode on Mango production (**May 10, 2025**) with 26 farmers.

*Visual Telecast of "Krishi Chaupal" Program at KVK NDRI, Karnal on **April 12, 2025***

- A 5-day on-campus training on Beekeeping was held at KVK, NDRI, Karnal (**June 23–25, 2025**) with 22 participants.
- The Fish Production Unit produced 5 lakh fish seeds through induced breeding and sold Catla, Rohu, and Grass carp seeds on **June 30, 2025**.

Fish Seed Production and Transportation

- KVK Karnal, in collaboration with the State Department of Horticulture and FPO Nilokheri, organized a "Kisan Chaupal" at Mannath Palace, Indri on **May 6, 2025**. Experts from KVKs, NABARD, NDRI, IIWBR, ISRI, and state departments addressed 350 farmers.

"Kisan Chaupal" programme at Mannath Palace, Indri, Karnal

- KVK Karnal organized awareness programmes on Natural Farming at KVK (**June 18, 2025**) and at Shekpura, Munak (**April 4, 2025**), with 52 participants actively engaging in discussions on sustainable practices.

TRAINING/WORKSHOPS/SEMINAR/SYMPOSIUM/ CONFERENCES ATTENDED

Name of Scientist	Duration	Title of the Programme
Dr. G.R. Gowane	**April 1 – 4, 025**	ICAR Annual Conference & IDF/ ISO Analytical week 2025 at NDDB, Anand.
Dr. Kaushik Khamrui Dr. Writdhama Prasad	**April 28 – May 3, 2025**	Visited Khatima, Halwani, Lankuan and Almora (Uttrakhand) to understand the current production practices for the traditional milk products at Uttrakhand, Cooperative Dairy Federation Ltd. (UCDFL).
Dr. Chitranayak Dr. Khushbu Kumari	**May 8- 9, 2025**	14th IDEA Convention & National Seminar and also delivered a talk at Kerala Veterinary and Animal Sciences University (KVASU), Mannuthy, Kerala.
Dr. Sanchita Garai Dr. Sanjit Maiti	**May 22–24, 2025**	12th National Seminar on "Futuristic Agriculture: Technology, Sustainability and Beyond" at Umiam, Meghalaya, India.
Dr. Shivaswamy G.P., Scientist	**June 6, 2025**	National Symposium on "Dairying for Nutrition and Livelihood Security" organized by IDA-SZ at ICAR-NIANP, Bengaluru
Dr. Priyanka	**June 16–20, 2025**	Training on "Advancing Women Leaders in Higher Education" under the Nurturing Future Leadership Programme (NFLP) at IRMA, Anand, Gujarat.
Dr Chitranayak, Dr. Khushbu Kumari	**May 8–9, 2025**	14th IDEA Convention & National Seminar on 'Engineering Challenges & Strategies for Sustainable Growth in Dairy & Food Processing' at VKIDFT, KVASU, Mannuthy, Kerala.

HONOURS/ AWARDS/ RECOGNITIONS

- Sanchita Garai, Sr. Scientist, Dairy Extension Division received Young Women Scientist Award during 12th National Seminar on "Futuristic Agriculture: Technology, Sustainability and Beyond" organized by Society for Community Mobilization for Sustainable Development (Mobilization) in collaboration with CAU Imphal and ICAR- Research Complex for NEH Region, Umiam during **May 22 – 24, 2025** at Umiam, Meghalaya, India.

Dr. Sanchita Garai being awarded Young Women Scientist Award by Society for Community Mobilization for Sustainable Development (Mobilization), New Delhi

- Lakshmi S, Veldandi A, Maiti S, Panja A and Sankhala G received best Oral Presentation Award for the research paper entitled "*Achieving Dairy Aspiration in Climate Realities: Women-Centric Climate Adaptation Plan for Rural Haryana using Fuzzy Cognitive Approach*" in 12th National Seminar on "Futuristic Agriculture: Technology, Sustainability and Beyond" organized by Society for Community Mobilization for Sustainable Development (MOBILIZATION) in collaboration with CAU Imphal and ICAR-Research Complex for NEH Region, Umiam during **May 22 – 24, 2025** at Umiam, Meghalaya.
- Maiti, S., Manjunath, K.V., Garai, S., Kumar, R., Mondal, G., Aggarwal, A. and Sankhala, G. received Best Oral Presentation award for the research paper entitled "*NDRI Climate Services: An Extension Model for Promoting Climate Smart Dairy Farming in Haryana*" in 12th National Seminar on "Futuristic Agriculture: Technology, Sustainability and Beyond" organized by Society for Community Mobilization for Sustainable Development (MOBILIZATION) in collaboration with CAU Imphal and ICAR-Research Complex for NEH Region, Umiam during **May 22 – 24, 2025** at Umiam, Meghalaya.
- Rohit H.K., secured 2nd Best Ph.D. Thesis Award in 14th IDEA Convention & National Seminar on 'Engineering Challenges & Strategies for Sustainable Growth in Dairy & Food Processing' during **May 8 – 9, 2025** at VKIDFT, KVASU, Mannuthy, Kerala.
- Khushbu Kumari secured 3rd prize for Poster Presentation in faculty category on "*Milk Source Based Electrical Characterisation of Yoghurt*" authored by Rishi Shringi, Khushbu Kumari, Chitranayak and Anand Kishore in 14th IDEA Convention & National Seminar on 'Engineering Challenges & Strategies for Sustainable Growth in Dairy & Food Processing' during **May 8 – 9, 2025** at VKIDFT, KVASU, Mannuthy, Kerala.
- Kiran Goyat secured 1st prize for Poster Presentation in student category on "*Development of a Horizontal Compact Thawing Device for Bovine Semen Straws*" authored by Kiran Goyat, Ankit Deep and Nishant KumarIn 14th IDEA Convention & National Seminar on 'Engineering Challenges & Strategies for Sustainable Growth in Dairy & Food Processing' during **May 8 – 9, 2025** at VKIDFT, KVASU, Mannuthy, Kerala.
- Shivam Kumar Pandey secured 3rd prize for Poster Presentation in student category on "*Thermal Analysis of Liquid-Solid Interface for Rapid Milk Cooling*" authored by Shivam Kumar Pandey, P.S. Minz, Chitranayak, and J.K. Dabas In 14th IDEA Convention & National Seminar on 'Engineering Challenges & Strategies for Sustainable Growth in Dairy & Food Processing' during **May 8 – 9, 2025** at VKIDFT, KVASU, Mannuthy, Kerala.

PERSONALIA

Joining/ Promotions/ Transfers/ Retirements

- Dr. Richa Singh, Scientist joined to the post of Senior Scientist, Dairy Chemistry Division on **April 21, 2025** vide Office Order F.No.13-683/2014/e-91559/E-I(S)/228-240 dated 28.05.2025 and Council's Office Memorandum F.No.6(3)/2025-Per.-III dated 15.04.2025.
- Sh. Bhagwan Dass, AAO joined to the post of Administrative Officer on **April 28, 2025** vide Office Order F.No.13-688/2014/e-126057/E-I(S)/97-106 dated 05.05.2025 and Council's Office Order F.No. Admn./3-1/2021/ Estt.-1 dated 25.04.2025.

- Dr. Shilpa Shree B.G., Assistant Professor, Dairy Science College, KVAFSU, Hebbal, Bengaluru joined to the post of Senior Scientist, Dairy Chemistry Division on **May 7, 2025** vide Office Order F.No.13-810/2025/E-I(S)/e-374199/143-158 dated 21.05.2025 and Council's Office Memorandum F.No.6(5)/2025-Per.-II dated 12.04.2025.
- Mrs. Veena Sathi, Mrs. Simranjeet Kaur Lall and Mrs. Meena Kumari joined to the post of Assistant Administrative Officers on **May 29, 2025** vide Office Order F.No.6-33/DPC/e-148786/E-I(S) Vol.VI-221-223 dated 28.05.2025.
- Sh. Jagdish Chander, CF&AO has superannuated on **May 31, 2025** for Council active service, Audit Section, ICAR-NDRI, Karnal.
- Dr. Rajesh Kumar Bajaj, Principal Scientist joined to the post of Head, Dairy Chemisty Division on **June 3, 2025** (AN) vide Office Order F.No.13-484/2018/e-131616/E-I(S)/353/471 dated 13.06.2025 and Council's Memorandum F.No.39 (9) 2021/Per. III dated 03.06.2025.
- Dr. Anuradha Bhardwaj, Principal Scientist after relieving NRC-Equines, Hissar on **June 13, 2025** joined at Animal Biotechnology Division vide Office Order F.No.13-814/2025/E-I(S)/e- 378684/406-419 dated 26.06.2025 and Council's Office Memorandum F. No.11-1/2025/Per. II/e-377105(i) dated 11.06.2025.
- Dr. K. Jayaraja Rao, Principal Scientist, ICAR-NDRI-SRS, Bangalore superannuated on **June 30, 2025** from Council's active service.

राजभाषा एकक

संस्थान राजभाषा कार्यान्वयन समिति की बैठक

भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की राजभाषा कार्यान्वयन समिति की दिनांक 30.06.2025 को संपन्न हुई 107वीं समीक्षा बैठक का कार्यवृत्त

डॉ. धीर सिंह, निदेशक, भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की अध्यक्षता में संस्थान राजभाषा कार्यान्वयन समिति की **1 अप्रैल से 30 जून, 2025** तक की 107 वीं तिमाही समीक्षा बैठक दिनांक **जून 30, 2025** को पूर्वाह्न 11:00 बजे के साथ संस्थान के डॉ. एन. एन. दस्तूर सभागार में आयोजित की गयी। बैठक के दौरान 13 बिन्दुओं पर विस्तार से चर्चा की।

हिन्दी कार्यशाला का आयोजन

संस्थान में दो दिवसीय कार्यशाला दिनांक **जून 26-27, 2025** को (कंप्यूटर हिन्दी डेस्क प्रशिक्षण व्यावहारिक) कार्यशाला का आयोजन किया गया। जिसमें संस्थान के 18 अधिकारी एवं 22 कर्मचारी शामिल हुए।

नगरस्तरीय राजभाषा गतिविधियां

नगर राजभाषा कार्यान्वयन समिति, करनाल के अध्यक्षीय कार्यालय भाकृअनुप–राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल में दिनांक **जून 30, 2025** को 81वीं नगरस्तरीय छमाही समीक्षा बैठक का डॉ. धीर सिंह, निदेशक की अध्यक्षता में संस्थान के डॉ. एन. एन. दस्तूर सभागार में आयोजन किया गया। इस बैठक में समिति के करनाल नगर के केन्द्रीय कार्यालयों के प्रशासनिक प्रमुखों एवं प्राधिकृत अधिकारियों ने भाग लिया। वर्ष 2024-25 के दौरान सदस्य कार्यालयों

को उनके द्वारा किए गए उत्तम कार्य हेतु प्रथम, द्वितीय एवं तृतीय पुरस्कार प्रदान किया गया। इसके अलावा पत्रिका प्रकाशन श्रेणी में भी सदस्य कार्यालयों को पुरस्कृत किया गया।

*नगर राजभाषा कार्यान्वयन समिति की छमाही बैठक (**जून 30, 2025**) की झलक*

SOUTHERN CAMPUS, BENGALURU

Research

Dairy Entrepreneurial Readiness among Rural Youth of Karnataka: An Explorative Study

Gunashekhar H. and S. Subash

A study on entrepreneurial readiness among rural youth in Karnataka using a modified *Theory of Planned Behaviour (TPB)* approach found that political and economic factors have the strongest influence on the dairy ecosystem (PESTEL-M analysis). Actor linkage mapping showed weak to moderate connections (levels 1–2) between youth and other stakeholders. Using PLS-SEM, personal attitude, subjective norm, perceived behavioural control, and risk orientation were found to significantly enhance entrepreneurial readiness, while economic motivation was not significant.

Synergistic effect of amoxicillin and N-acetylcysteine against mastitis-associated bacteria

Mamta Chauhan and V. Mounica

A micro-broth dilution assay tested the combined effect of amoxicillin and N-acetyl cysteine (NAC) against *E. coli* (EC 91, EC 70, EC 192) and *Staphylococcus aureus* (SA 13) from mastitis cases. Individually, the MICs were 64 µg/mL (amoxicillin) and 64 mg/mL (NAC). In combination, growth inhibition was achieved with 32 µg/mL amoxicillin + 32 mg/mL NAC, showing a synergistic effect. This suggests that the effective dose of amoxicillin can be reduced by 50% without loss of antibacterial efficacy *in vitro*.

Events

Under ICAR's flagship programme 'Viksit Krishi Sankalp Abhiyan' (**May 29–June 12, 2025**), 15 scientists from SRS of ICAR-NDRI participated in campaigns across 200 villages in nine districts of Karnataka, reaching about 40,000 farmers. Scientists interacted with farmers to understand grassroots issues, documented feedback and innovations, and demonstrated improved agricultural technologies and practices covering crops, livestock, poultry, and fisheries, along with information on government schemes.

*Participation of faculties of SRS-ICAR- NDRI in 'Viksit Krishi Sankalp Abhiyan' (VKSA), conducted from **May 29 to June 12, 2025** in Karnataka state and local media coverage of the various programmes organized under VKSA*

*Visit of Shri. Shivaswamy B. KAS, Managing Director/ C.E.O. and team of the officials of Karnataka Milk Federation, Bengaluru to the Historical building, dairy farm at Livestock Research Centre, Theriogenology Laboratory of the Station and interacted with Head, SRS, ICAR-NDRI, Bengaluru on the eve of World Milk Day on **June 6, 2025***

*Honourable Director and Vice-Chancellor of the ICAR-NDRI, Karnal visited the Southern Regional Station on **June 13, 2025** and interacted with all the faculties about their research progress, and also interacted with the students about their learning and laboratory experiences*

Inauguration of Dairy Entrepreneurship and Skill Development Center

A new 'Dairy Entrepreneurship and Skill Development Center' was inaugurated on **April 11, 2025** at ICAR-NDRI, SRS, Bengaluru under the RKVY programme. The facility, built over 136 sq. m with an outlay of ₹103 lakh, features modern infrastructure including a video conferencing system. The center will host training and skill development programmes for farmers, entrepreneurs, and extension personnel. Chief Guest Ms. Alka Nangia Arora (Additional Secretary, DARE & FA, ICAR) inaugurated the center in the presence of Dr. Dheer Singh, Director & Vice-Chancellor, ICAR-NDRI, and other dignitaries. The facility is envisioned as a hub for capacity building and knowledge dissemination in dairying.

*Glimpses of events showing the inaugural function of the Dairy Entrepreneurship and Skill Development Center at SRS, Bengaluru by Ms. Alka Nangia Arora, Additional Secretary (DARE) & Financial Advisor (ICAR), New Delhi, in the august presence of Dr. Dheer Singh, Director & Vice-Chancellor, ICAR- NDRI, Karnal on **April 11, 2025***

Dairy Extension: KVK as well as Dairy Extension Division

- 467 dairy farmers from Tamil Nadu visited SRS-NDRI for a one-day exposure visit and training under the ATMA programme.
- 317 students from educational institutions of Southern India attended one-day exposure visits at SRS-NDRI, Bengaluru.
- SRS-ICAR-NDRI arranged an exhibition depicting the achievements of the Institute at ICAR-IIHR on **June 8, 2025**, during the visit of the Hon'ble Union Agriculture Minister as part of the VKSA programme.

Dairy farmers from Tamil Nadu, visited SRS, NDRI for one day exposure visit and training on 'Dairy farming Practices' under ATMA programme, students under exposure visit and participation in exhibition

Visit Abroad

Dr. F. Magdaline Eljeeva Emerald, Principal Scientist, Dairy Engineering Section, SRS-ICAR-NDRI, Bengaluru, visited the University of Alberta, Edmonton, Canada from **April 3–16, 2025** under the *Overseas Doctoral Visiting Fellowship* scheme as the supervisor of Mr. Adityasukumar Pasagadi, Ph.D. Scholar in Dairy Engineering, for collaborative research.

Rajbhasha Ekak (राजभाषा एकक)

Hindi Workshop was organized on **June 26, 2025** on the subject "सरल, प्रभावी और व्यावसायिक हिंदी लेखन"/ Clear, Effective, and Professional Hindi Writing in Official Communication and total of 28 faculties and staff participated in the programme.

EASTERN CAMPUS, KALYANI

Field activities carried out under TSP

Input Distribution to Tribal Farmers under TSP at ICAR-NDRI ERS, Kalyani

On **April 11, 2025**, ERS-ICAR-NDRI organized a Tribal Sub-Plan (TSP) programme at Nadia, West Bengal. Essential inputs such as utensils, balanced feed, and resources were distributed to 142 tribal farmers to promote scientific dairy farming and improved livestock management. The initiative reflects ICAR-NDRI's commitment to livelihood enhancement and inclusive rural development.

Input distribution to beneficiaries under Tribal Sub-Plan (TSP) programme at Nadia, West Bengal

Integrated Livestock and Crop Development Initiative at Banamalipara Village

On **April 21, 2025**, ERS-ICAR-NDRI organized an animal health camp at Banamalipara village, West Bengal, benefiting 80+ farmers through vaccination and treatment of goats and poultry. The team also reviewed FLD programmes in crops (paddy, banana, pointed gourd) and visited farmers practicing integrated farming systems with goats, poultry, and pigs. The initiative received positive feedback and highlighted the role of ICAR-NDRI in animal health, income generation, and sustainable livelihoods.

Animal health camp at Banamalipara village, West Bengal

Livelihood Improvement Programme for Tribal Farmers through Livestock Health Camp and Agricultural Field Visit

ICAR-NDRI, ERS, Kalyani organized a one-day programme on *"Livelihood Improvement of Tribal Farmers through Livestock Health Camp"* at Fulia, Nadia, West Bengal. A total of 44 tribal farmers benefited, with 616 animals (165 goats, 201 cattle, 128 poultry, 122 ducks) treated/ vaccinated and 35 kg mineral mixtures distributed. The team also visited paddy and sesame fields under FLD of the TSP project, where farmers showed encouraging adoption of scientific practices, indicating positive impact on productivity and income generation.

Livelihood Improvement of Tribal Farmers through Livestock Health Camp at Fulia, Nadia

Residential Capacity Development Programme

Residential Training on Scientific Animal Husbandry Empowers Farmers from Seraikela-Kharsawan, Jhakhand

A five-day residential training on 'Scientific Animal Husbandry' was organized at ICAR-NDRI, ERS, Kalyani (**May 19–23, 2025**) for 24 farmers from Jharkhand. The programme covered breeding, feeding, healthcare, and livestock management, with expert lectures, hands-on demonstrations, and exposure visits. Participants gave positive feedback and showed readiness to adopt scientific practices.

A five-day residential training on 'Scientific Animal Husbandry' was organized at ICAR-NDRI, ERS, Kalyani

Empowering Women through Training on Kid Nursery and Scientific Goat Farming

A five-day training on 'Kid Nursery and Scientific Goat Farming Practices' was organized at ICAR-NDRI, ERS, Kalyani (**May 26–30, 2025**), sponsored by ITC. A total of 23 women farmers from Hooghly and Howrah districts participated. The program covered key aspects of kid management, feeding, healthcare, housing, breed improvement, entrepreneurship, and marketing, and included expert-led sessions, practical demonstrations, and an interactive discussion with a successful goat entrepreneur. Participants expressed confidence in adopting the practices, highlighting the programme's role in empowering rural women and promoting sustainable goat farming.

A five-day training on 'Kid Nursery and Scientific Goat Farming Practices'

Published by: Director, ICAR-NDRI, Karnal

Tel.: 0184-2252800 | **Fax:** 0184-2250042 | **E-mail:** dir.ndri@gmail.com | **Gram:** DAIRYRESEARCH