

## From the Director's Desk

The Indian dairy sector holds a prominent position at the global platform by being the top most producer of milk since last 25 years and its great potential in achieving the sustainable development goals (SDGs). However, dairy value chain in our country is highly fragmented and sector is facing issues which need urgent redressal including low productivity of milch animals, lack of proper infrastructure, quality issues, and limited access to technology for small-scale farmers.

Dairy Science education is vital for the sustainable growth and development of the dairy sector. An in-depth understating of the issues that may plague the dairy sector may ignite the creative minds for solutions. Our course curriculum equips the students with the requisite skills to solve the problems of dairy value chain, instil the confidence to become entrepreneurs and endow the leadership attributes required for sustained growth of the sector.

ICAR-NDRI is a premier academic and research organization that has contributed immensely through development of technologies for multiplication of superior germplasm, feed/fodder, housing management and value addition in milk. The four-year flagship B.Tech. program in Dairy Technology equips students with the desired knowledge and skills to understand the science behind milk production, processing, and quality control. The Institute offers Masters and doctoral programmes in various disciplines of Dairy and animal science to provide in-depth knowledge in their respective fields, focusing on multidisciplinary approach, advanced concepts, research methodologies and practical applications.

Students from every corner of the country are admitted through national-wide conducted competitive examination and it can be termed as "Mini Bharat". Deemed university features among the favoured destinations for the students and researchers from several Asian and African countries who wish to pursue their career in animal and dairy science. ICAR-NDRI has maintained an excellent placement record since beginning and students have been recruited by milk & food processing companies, animal husbandry departments, dairy cooperatives, academic and research institutions, financial institutions, developmental organizations and private sector. According to an estimate, 60-65% manpower in technical positions employed by the Indian dairy sector is an alumnus of ICAR-NDRI. ICAR-NDRI duly recognizes the importance of extra-curricular activities for the holistic development of students contributing to fostering their



talents and personal growth. Institute conduct several personality development workshops, communication skill enhancement sessions, team building, leadership development, stress management and pedagogical programmes on regular basis. Newer initiatives such as Foundation Programme for fresher, foreign language courses for UG students, Earn-while-learn, Gyanodaya, Student Empowerment Club and Social outreach programme; have been initiated to inculcate the best practices among students. Under the IDP-NAHEP project it is worth mentioning that more than 100 UG students and 42 faculties were deputed for

overseas internship and training, respectively. Further, entrepreneurship development programmes including sensitization workshops, experiential learning activities, hackathons and innovative idea contests are organized to promote the creativity and innovation among the students. The steps taken by ICAR-NDRI reflect the institute's commitment to achieve the goals of National Education Policy-2020 (NEP-2020) through adoption of multidisciplinary approach in curriculum delivery, promoting critical thinking and problem-solving skills, embracing blended learning platforms and integrating experiential learning opportunities to prepare out youths for the challenges of present and future. Faculty development programmes have been organized to sensitize the scientists to prepare and equip themselves to meet the goals envisaged under the NEP-2020.

Institute aims at among the leading institutions for academic & research excellence to create leaders in frontier areas of dairy science & technology and employing generated knowledge for the welfare of society and sustainability of environment at global level. Institute is partnering with several national and international universities and research organizations to offer newer educational programmes and enhancing the academic standards through students, faculty exchange, dual degree and engaging professor of practice (POP). Our futuristic approach is student centric, promotion of innovations, equitable access and accountability, environmental and social responsiveness.

**(Dr. Dheer Singh)**

Director & Vice-Chancellor  
ICAR-NDRI, Karnal

FROM THE DIRECTOR'S DESK	RESEARCH	EXTENSION	EVENTS	HONOURS AND AWARDS	PERSONALIA	राजभाषा एकक	SOUTHERN CAMPUS, BENGALURU	EASTERN CAMPUS, KALYANI
1	2	4	8	12	12	14	15	17

## RESEARCH

### Ganga: India First Cloned Cow Produced by ICAR-NDRI, Karnal

(Naresh Selokar, Manoj Kumar Singh, Ajay Aswal, SS Lathwal, Subhash Kumar, Ranjeet Verma, Kartikey Patel, MS Chauhan)

ICAR-National Dairy Research Institute (ICAR-NDRI) in Karnal initiated a groundbreaking effort in 2022-cloning indigenous cows like Gir, Sahiwal, and Red-Sindhi. The institute developed a cost-effective and efficient animal cloning technology. To produce clones of a cow, oocytes are isolated from live animals (Sahiwal) using ultrasound-guided needles, and then, matured for 24 h under control conditions. The somatic cells of superior cows (Gir) are used as donor genomes, which are fused with ovum pick-up (OPU)-derived enucleated oocytes. Following chemical activation and *in-vitro* culture, the embryos are developed to the blastocyst stage which is then transferred into recipient mothers (cross-bred cows). After 9 months, a cloned calf is born. After two years of dedicated work, the team at ICAR-NDRI achieved a significant milestone with the birth of a cloned Gir female calf named Ganga on March 16, 2023. This calf is growing well and healthy. Gir cattle, known for their hardiness and resistance to tropical diseases, are a prized indigenous breed from Gujarat, India, exported globally. The successful cloning of Ganga marks a crucial step toward addressing the challenges of low productivity in indigenous cows. This achievement opens new possibilities for advancing scientific efforts in producing high-quality dairy animals. Research carried out at the ICAR-NDRI will certainly help to reach advanced technologies at farmers' doors for enhancing the productivity of their dairy animals which will lead to future sustainable milk production in the country. Process of cloning is depicted in Figure.



*Hon'ble President of India, Smt. Droupadi Murmu Ji showing her affection to India's first cloned cow calf "Ganga" (belongs to indigenous Gir cow) produced at ICAR National Dairy Research Institute, Karnal during her visit on April 24, 2023.*



*India's first cloned cow calf "Ganga" along with donar. Ganga was born on 16th March 2023 and birth weight was 32 Kgs.*

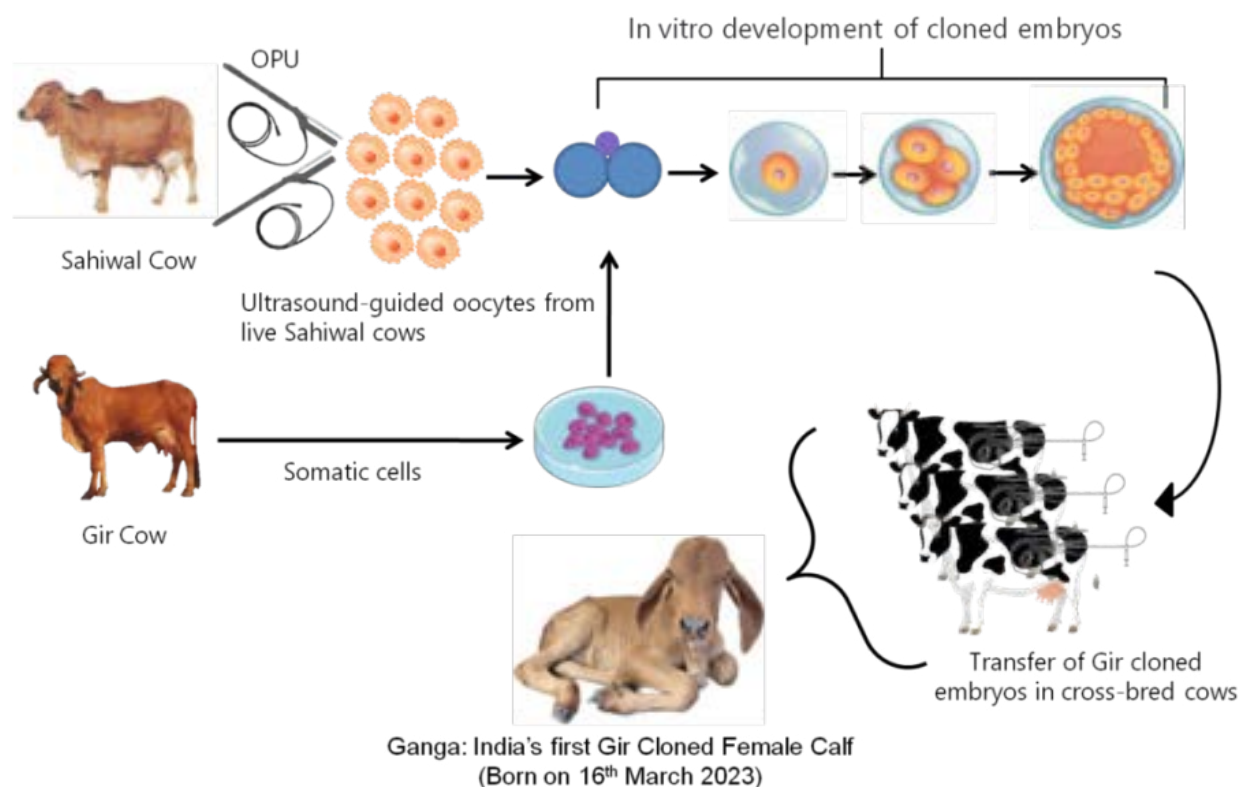


Figure 1: Process of producing India's first cloned indigenous Gir cow.

## Effects of air velocity levels on Sahiwal cows during hot humid season

(Ashutosh, Anil Kumar, Sunita Meena and Sudha Saini, National Innovations in Climate Resilient Agriculture (NICRA), Animal Physiology Division)

This study determined the effects of different relative air velocity (AV) levels on dairy cows. Six Sahiwal dairy cows were housed inside climate-controlled chamber, in which the climatic conditions were programmed to make thermoneutral conditions at 25.0°C temperature, 35% relative humidity and 65 THI for three hours. Control animals were kept under normal hot humid environmental condition with 31°C temperature, 70% relative humidity and 85 THI. Thermal images of both groups were captured using thermal imaging camera after each exposure. After exposing under thermoneutral climatic condition, experimental animals were kept at variable wind velocities from 5 KMPH to 40 KMPH for three hours each in 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, 30.0, 32.5, 35.0, 37.4 and 40.0 KMPH in the shed with 32°C temperature, 70% relative humidity and 85 THI. Temperature of different body

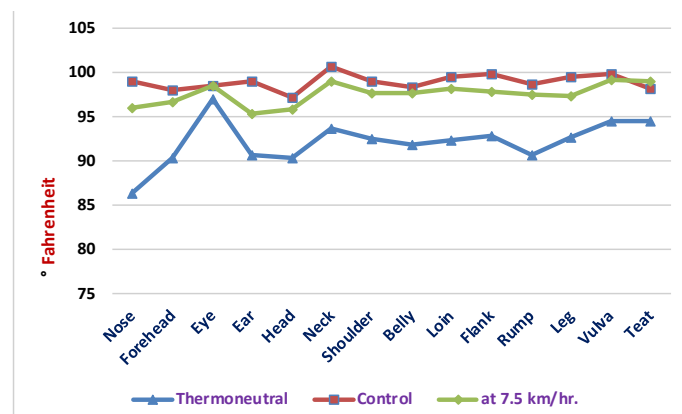


Fig 1: Effect of 7.5 Km/hr. air velocity on surface temperature of Sahiwal cows maintained under different conditions.

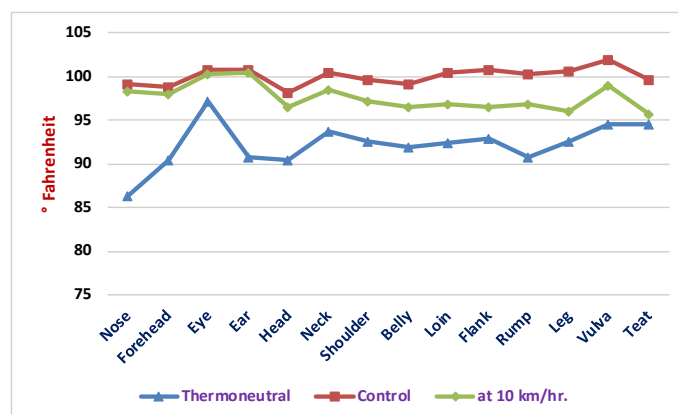


Fig 2: Effect of 10.0 Km/hr. air velocity on surface temperature of Sahiwal cows maintained under different conditions.



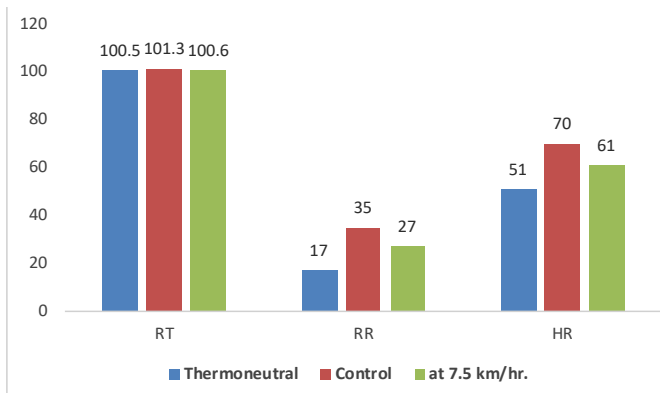


Fig 3: Effect of 7.5 Km/hr. air velocity on physiological reactions of Sahiwal cows maintained under different conditions.

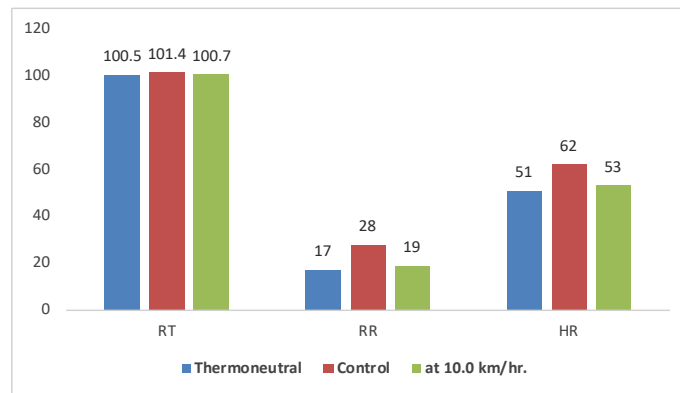


Fig 4: Effect of 10.0 Km/hr. air velocity on physiological reactions of Sahiwal cows maintained under different conditions.

parts of animal such as nose, forehead, eye, ear, head, neck, shoulder, belly, loin, flank, rump, leg, vulva and teat were observed using thermal imaging software. The physiological reactions i.e. respiration rate, heart rate and rectal temperature showed that animal were more comfortable under 10 km/hour wind exposure.

## Institutional Technology Management Cell

### Technology Commercialized

Technology on “Spore based kit for detection of antibiotic residues in milk at dairy farm” was transferred to M/S Beejapuri Dairy Pvt. Ltd. (Country Delight) with a technology price of Rs. 4 lakhs +18% GST during technology transfer meeting held on June 8, 2023.



Commercialization of Technology titled “Spore based kit for detection of antibiotic residues in milk at dairy farm” on June 8, 2023 at NDRI, Karnal

# EXTENSION

## Dairy Extension Division

### Exhibition organized

Date	Duration	Place	Event	Visitors
April 18-20, 2023	3 days	Trade Facilitation Centre (TFC), Varanasi	The G-20 Meeting of Agricultural Chief Scientists (G20-MACS)	250

### Demonstration of improved varieties of Paddy for enhancing productivity

It is a crucial aspect of rice cultivation ensuring that farmers have access to quality seeds that are suited to their specific growing conditions. Under our FFP Project,

farmers were provided with access to innovative and improved varieties of rice i.e. PB-1847, PB-1885 & PB-1886 in the seven villages of the Karnal district of 173 farmers. This intervention was advocated for promoting sustainable agricultural practices and also ensuring food

security, better livelihood, embracing change, fostering innovation, and collaborating with farmers.



### Theileriosis Vaccination Programme

It is a crucial tool in managing and controlling the spread of the debilitating theileriosis disease in cattle. This tick-borne disease affects bovine species and can lead to severe economic implications due to decreased milk yield, weight loss, and high mortality rates in affected animals. In view of the theileriosis control programme, 53 animals were vaccinated against this disease in the village Garhi Gujran.



### Krishi Vigyan Kendra

KVK organized awareness program and kisan goshti in Natural Farming on April 3, 2023 at village Manchuri. KVK experts delivered lectures on different aspects of natural farming. In this program 64 farmers and farmwomen participated.

- ♦ KVK participated in National Dairy Mela organized by ICAR-NDRI from April 8-10, 2023. KVK stall was installed for demonstration and awareness purpose. KVK subject experts explained and encouraged the farmers/ rural youths to undergo

training. The theme of the stall was on integrated farming system.



- ♦ A Kisan Sangosthi program was organized on April 9, 2023. The experts of different agriculture and animal science subjects gave lectures and answered the queries of the farmers.
- ♦ KVK organized field visit to fish farmer's unit at village Kamalpur Rodan on April 19, 2023 to take up and discuss queries on disease and nutrition management. A total of 10 farmers participated in the event and 2000 fingerlings of Indian Basa (*Pangasius bocourti*) were procured from the farmers to further propagate and culture in KVK ponds.
- ♦ Organized virtual telecast of 100<sup>th</sup> episode of 'Man Ki Baat' and awareness program on Natural farming on April 30, 2023 in which 74 farmers participated.







- ♦ To commemorate 'International Year of Millet', a millet recipe contest was organized at Gogripur village participated by 25 rural ladies on May 18, 2023. Ladies of the village participated in this contest out of which the best recipe was given prize.



- ♦ Awareness program on natural farming was organized at KVK in collaboration with KRIBCO. In all 40 participants including fertilizer dealers, scientists, farmers and KVK staff took part in this event.



- ♦ Campaign on soil health management was organized at village Barsalu as a part of 'Mission Life' program on May 23, 2023. In this event 20 farmers and KVK staffs participated. Lecture on soil fertility and management and natural farming was given by the KVK expert.
- ♦ 'World Milk Day' was celebrated on June 1, 2023 at ICAR-NDRI milk parlour. The program was inaugurated by Hon'ble director Dr. Dheer Singh. KVK along with 30 rural ladies participated in the event.
- ♦ Awareness and demonstration program on the use of Agri-drone for spraying was organized by KVK on June 1, 2023 as a part of 'Life Mission' program. Farmwomen, rural ladies and ladies from SHG participated in this program.



- ♦ Awareness program and tree plantation campaign was organized at KVK to celebrate 'World Environment Day' on June 5, 2023. The main theme of the program was 'Say No to Plastics'. The program had a participation of 75 participants.
- ♦ Awareness program on 'Jal Shakti Abhiyan' and Natural Farming was organized at village Dachar on June 6, 2023 as a part of 'Mission Life' program. In this event KVK experts delivered lectures on various aspects of water conservation in agriculture and natural farming.



- ♦ 'Field Experience Training' (FET) was organized for newly recruited 6 ARS scientist at KVK from May 29, 2023 to June 16, 2023. Interaction with the farmers

and data collection on agricultural activities were conducted at village Nabhipur.



## Other activities

Activities	Place	Participants	Date
Awareness on kitchen gardening and poshak vatica	Padhana	20	April 12, 2023
Cluster frontline demonstration on Pulse crop Summer Moong	Phurlak	12	May 7, 2023
	Tikri	15	May 12, 2023
	Barsalu	15	May 23, 2023
	Kaimla	10	May 29, 2023
	Picholia	12	May 30, 2023
	Kudak Jagir	15	June 13, 2023
	Phurlak	10	June 20, 2023
Awareness programme on Natural Farming	KVK	40	May 18, 2023
	Barsalu	20	May 23, 2023
	Kaimala	10	May 29, 2023
	Dachar	60	June 6, 2023
Awareness on global millet program	Gogripur	25	May 18, 2023





## On-Campus Training

Activities	Beneficiaries	Date
प्राकृतिक खेती	40	April 21, 2023
मधुमक्खी पालन	53	April 25-28, 2023
मत्स्य पालन	30	May 2-5, 2023
डेरी प्रसंस्करण प्रशिक्षण कार्यक्रम	32	May 23-26, 2023
	30	June 20-23, 2023
वैज्ञानिक विधि से पशुपालन	47	May 12-16, 2023
	27	May 22-26, 2023
वैज्ञानिक विधि से बकरी पालन	50	June 5-9, 2023



## Cluster Frontline Demonstrations

During the summer season 2023, a total of 56 demonstrations on crop moong were laid in 23.3 hectare area under irrigated conditions. The variety MH-1142 was used for conducting FLDs. The overall performance of the above variety of Summer Moong was found to be good.

## Krishi Vigyan Kendra Visited farmers during exposure visit

During the period from April to June 2023, a total of 272 farmers/ farm women from different states of India visited KVK, ICAR-NDRI, Karnal under exposure visit.

# EVENTS

## 19<sup>th</sup> Convocation of ICAR-NDRI Organized

Convocation of ICAR-NDRI was organized on April 24, 2023 in the august presence of Hon'ble President of India Smt. Droupadi Murmu Ji. While chairing the 19<sup>th</sup> convocation ceremony, the Hon'ble President conferred degrees upon 544 students including gold medals.

While congratulating the students receiving degrees, Hon'ble President, Smt. Droupadi Murmu said that with these degrees a new chapter had been started in their life and each one of them should continue the streak of learning new things along with making significant contributions for the welfare of the people.







*Hon'ble President of India  
Smt. Droupadi Murmu confers  
degree on a student during the  
19<sup>th</sup> Convocation Ceremony of  
the ICAR-NDRI, Karnal.*



The Hon'ble President called upon the young scientists to contribute significantly to the progress of the nation and become entrepreneurs to create jobs along with getting employment in the dairy industry. She conferred gold medals and degrees on six students. The remaining 536 degrees were given to students by Dr. Himanshu Pathak, Secretary DARE and Director-General, Indian Council of Agricultural Research (ICAR), New Delhi. Chief Minister, Haryana, Sh. Manohar Lal Khattar also conferred honoris causa on Dr. Ramesh Chandra, Member, Planning Commission; Dr. B. N. Mathur, Former Director, ICAR-NDRI; and Dr. M. S. Chauhan, Vice Chancellor, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, for their outstanding contributions in the sphere of dairy science.



The Hon'ble President hailed women dairy farmers of the country for their contributions in making the country self-reliant in milk production and stressed on the need to give them more opportunities. Lauding the food habits of the state, the Hon'ble President said because of its healthy and pure delicacies, the state was called Desha mein desh Hariyaana, jahaan doodh-dahee ka khana.

Union Minister for Agriculture and Farmers Welfare Sh. Narendra Singh Tomar; Union Minister of Fisheries, Animal Husbandry and Dairying, Sh. Parshottam Rupala and Union Minister of State for Agriculture and Farmers Welfare, Sh. Kailash Choudhary also graced the convocation ceremony.



Haryana Governor Bandaru Dattatraya counted some challenges like changing weather, increasing input cost, emergence of new diseases and lack of awareness about animal welfare measures and exhorted the passing out students to overcome the challenges.

The Chief Minister Sh. Manohar Lal said that the state government would provide loans to unemployed youth interested in running the dairy industry, which would help in making them self-employed. This step would certainly prove to be resourceful in ensuring their contribution in milk supply to the country apart from giving them self-employment opportunities. Describing the farmers of Haryana as 'hardworking', the Chief Minister of Haryana said that the availability of milk in the country was 444 gm per person per day, whereas, in Haryana, it was 1,127 gm. He urged the NDRI Vice Chancellor, Dr. Dheer Singh, to organize a get-together of the alumni of NDRI so that the students could take inspiration from them.

'Dr. S. K. Sirohi Memorial Award' for the year 2022 and 2023 was awarded to Dr. Raghu H. V., Senior Scientist, Dairy Microbiology and Dr. Sachin Kumar, Scientist, Animal Nutrition, respectively during the Convocation.

## National Dairy Mela

Three day National Dairy Mela was organized at ICAR-NDRI Karnal from April 8-10, 2023. The Dairy Mela was inaugurated by Dr. Bhupendra Nath Tripathi, Deputy Director General (Animal Science), Indian Council of Agricultural Research (ICAR), New Delhi on April 8, 2023 to mark the 100 years of inception of the Institute. A Dairy Samarika and the Institute's official language magazine "Dugdh Ganga" were also released on the inaugural occasion. Welcoming the dignitaries at the inauguration of the National Dairy Mela, Dr. Dheer Singh, Director and Vice-Chancellor, ICAR-NDRI, Karnal informed the gathering that the NDRI has developed 150 technologies during its 100 years period, out of which 46 have been filed for patents whereas 36 technologies have already been patented. In addition, 86 technologies have also been commercialized. The main attraction of this Mela was Swasarupa named cloned buffalo displayed in the mela ground. Dr. Dheer Singh further said that more than 200 stalls were set up in this Mela, wherein more than 100 stalls were exhibited by industry entrepreneurs,

startups, self-help groups, banks and many other institutions related to dairy science.

In this Mela, 15 stalls of the Institutes of Indian Council of Agricultural Research were set up for the benefit of the farmers through their latest technologies and techniques. Krishi Vigyan Kendras and their farmers accompanying them also participated in the Mela. Speaking as the chief guest at the inaugural function, Dr. Tripathi remarked that keeping in view the changing environment, limited water and land resources, the cattle of advanced breeds having sublime productivity can sustain in the modulating ambience. In all, 37,583 farmers, animal rearers, dairy entrepreneurs and curious visitors visited the National Dairy Mela and 400 animals participated in various competitions of milking and beauty contests. Women farmers also participated in milking and paneer making competition. Sh. Meenesh Shah, Chairman and Managing Director of NDDB, Anand, Gujarat in the valedictory function highlighted about the contribution of India to the extent of 20% of the world's milk production and emphasized that more efforts are required to meet climate resilience and simultaneously augment the farmers' income.



## Research Advisory Committee Meeting Organized

The meeting of the Institute Research Advisory Committee was held from June 27-28, 2023 under the chairmanship of Dr. Nagendra Sharma, Former Director, ICAR-NDRI, Karnal. RAC appreciated the technology transfer effort made by NDRI. It was recommended that the efforts need to be made for nation-wide publicity of strip tests for detection of adulterants in milk. The dairy cultures developed by the Institute should be commercialized at global level.



It was also recommended that NDRI should continue to develop new generation analytical methods for ascertaining quality of milk and milk products. RAC also suggested developing sensors for real-time quality monitoring of packaged dairy products. It was

also suggested to develop alternative environment friendly packaging materials for dairy products. Regular feedback from Mobile App users should be obtained and Apps be updated accordingly. Further, the geographical coverage may be expanded.



### World Blood Donor Day

ICAR-NDRI has organized the World Blood Donor Day on June 14, 2023 in its premises to raise awareness of the importance of blood donation and to recognize the contribution of voluntary unpaid blood donors in saving lives and improving health. About 72 donors provided the blood during the mega event. It was organized in collaboration with Kalpana Chawla Government Medical College, Karnal and Indian Red Cross Society, Haryana chapter, Karnal. In fact, 14 June is the birthday of Karl Landsteiner (1868-1943), an Austrian biologist and physician, considered to be the “founder” of modern blood transfusion who also discovered the ABO blood groups. Every blood donation is a precious life saving gift and repeat donation is key to building a safe and sustainable blood supply and achieving Universal Health Coverage (UHC). It was organized as part of “Raktdaan Amrit Mahotsav” under Azadi Ka Amrit Mahotsav. The slogan for this year’s World Blood Donor Day campaign was “Give blood, give plasma, share life, share often”. It focused on patients requiring life-long transfusion support and underlines the role every single person can play, by giving the valuable gift of blood or plasma.

### World Environment Day

ICAR-NDRI organized World Environment Day on June 5, 2023 as an occasion to bring together the faculty and students for awareness and action for the environment. NDRI celebrated the World Environment Day 2023 with a thrust on the Mission LiFE. The concept of LiFE, i.e., Lifestyle for Environment was introduced by the Hon’ble Prime Minister, at the World Leaders’ Summit in Glasgow at the 2021 UNFCCC COP26, when he gave a clarion call to rekindle a global pursuit to adopt sustainable lifestyle and practices. NDRI organized cycle rally on June 5, 2023 involving students and faculty and tree plantation in NDRI premises on June 6, 2023. After the cycle rally, the participants were introduced with the objectives of Mission LiFE and a pledge on Mission-LiFE also took place, which was then followed by participant’s individual pledge towards following the action to promote the Mission LiFE. The day wrapped up with a bicycle rally which aimed to promote the theme of save energy under Mission LiFE. The purpose of organizing this programme in the NDRI campus was to create awareness and connect people in order to promote the notion of a Sustainable Lifestyle by staying connected to nature. The programme concluded with display of posters for LiFE slogans in Kalki Bhavan.

## HONOURS/ AWARDS/ RECOGNITIONS

The **Dr. S.K. Sirohi Memorial Outstanding Young Researcher Award 2022** was given to **Dr. Raghu H. V.**, Senior Scientist, Dairy Microbiology Division, at the **19<sup>th</sup> Convocation of the ICAR-NDRI** on April 24, 2023, at ICAR-NDRI, Karnal.



Dr. Sanjit Maiti received “Young Scientist Award” from the Indian Society of Extension Education, New Delhi in the ISEE National Seminar on ‘Evolving Extension Science towards Secondary Agriculture for Sustainable Development’ held at the University of Agricultural Sciences, Bangalore, India during June 22-24, 2023.

Amitava Panja, Siddhesh Zade, Sanchita Garai and Sanjit Maiti, received ‘Best Poster Presentation Award’ for their research paper entitled “Change in Cropping System: An Adaptation Strategy for Cyclone affected Coastal West Bengal” in the 5<sup>th</sup> International Conference on

‘Climate Change and its Impacts’ (CCI 2023) organized by Agricultural & Environmental Technology Development Society (AETDS) in Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST-K), Srinagar, Jammu and Kashmir, India during June 9-11, 2023.

Apoorva Veldandi, Siddhesh Zade, Sanchita Garai and Sanjit Maiti, received ‘Best Poster Presentation Award’ for their research paper “Farm Women and Climate Change: Closing Gender Gap for Strengthening Climate Resilience and Adaptation” in the 5<sup>th</sup> International Conference on ‘Climate Change and its Impacts’ (CCI 2023) organized by Agricultural & Environmental Technology Development Society (AETDS) in Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST-K), Srinagar, Jammu and Kashmir, India during June 9-11, 2023.

Amitava Panja, Sanchita Garai, Sanjit Maiti, B. S. Meena, Mukesh Bhakat and Gopal Sankhala received ‘Best Oral Presentation Award’ for their paper entitled “Can Fuzzy Cognitive Mapping add a New Dimension to Methodology for Agricultural Extension Research?” in the ISEE National Seminar on ‘Evolving Extension Science towards Secondary Agriculture for Sustainable Development’ organized by Indian Society of Extension Education, New Delhi at the University of Agricultural Sciences, Bangalore, India during June 22-24, 2023.

## PERSONALIA

### Training Permission

**Administrative/ Scientific Staff Attended Workshop/ Seminar/ Symposia/ Conference/ Training during the period April to June, 2023:**

Name & Designation	Title of the Training	Period
Dr. Writdhama G. Prasad, Scientist	Attended 6 <sup>th</sup> AMIFOST International Conference on “Multidisciplinary Approach for Healthy and Sustainable foods” at Amity University, Noida (online).	April 13-14, 2023
Dr. Yogesh Khetra, Senior Scientist	Presented the project proposal at Rajiv Gandhi Centre of Biotechnology, Thiruvananthapuram, Kerala.	May 18-19, 2023



Dr. Sumit Arora, Principal Scientist	Attended and delivered a talk in one-day seminar with the theme of "Good Food, Health and Nutrition" at GADVASU, Ludhiana.	June 1, 2023
Dr. Sanchita Garai, Senior Scientist Dr. Sanjit Maiti, Senior Scientist	Attended and given oral presentation in the ISEE National Seminar-2023 on "Evolving Extension Science Towards Secondary Agriculture or Sustainable Development" at University of Agricultural Sciences, Bangalore.	June 22-24, 2023
Dr. Nitin Tyagi, Principal Scientist Dr. Sachin Kumar, Scientist	Delivered a lecture to the students at Nagpur Veterinary College, Nagpur in a training (High-end Workshop) Karyashala sponsored by DST-SERB on "Significance of Probiotic in livestock health and production" at Nagpur Veterinary College, Nagpur.	June 23-24, 2023

### Joining/ Promotions/ Transfers/ Retirements

- Sh. K. L. Meena, CAO (SG) transferred from NDRI, Karnal to CIFE, Mumbai vide Council Office Order No. Admn./F.No. 33-8/2021-Estt.I dated February 13, 2023 and he was relieved NDRI on April 6, 2023. Sh. Avesh Yadav, Comptroller transferred from NDRI to ICAR, New Delhi vide Council Office Order No. Admn./F.No. 17-1/2019-Estt.I dated April 5, 2023 and he was relieved NDRI on April 8, 2023.
- Dr. Manorama Kumari joined as Scientist (Dairy Microbiology) on April 11, 2023 at NDRI vide Council's F.No. Per. 35(1)/2023-Per.I(i) dated April 6, 2023.
- Dr. Basavaprabhu H.N. joined as Scientist (Dairy Microbiology) on April 11, 2023 at NDRI Regional Station of SRS, Bangalore vide Council's F.No. Per. 35(1)/2023-Per.I(i) dated April 6, 2023.
- Sh. Sonu K. S. joined as Scientist (Dairy Chemistry) on April 11, 2023 (Virtually) and Physically on April 20, 2023 (forenoon) at NDRI vide Council's F.No. Per. 35(1)/2023-Per.I(i) dated April 6, 2023.
- Dr. Vikas Vohra, Principal Scientist was appointed to the post of Head, Animal Genetics & Breeding Division, NDRI on April 18, 2023 forenoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 18, 2023.
- Dr. P. Barnwal, Principal Scientist was appointed to the post of Head, Dairy Engineering, NDRI on April 25, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. Shilpa Vij, Principal Scientist was appointed to the post of Head, Dairy Microbiology, NDRI on April 25, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. A. K. Dang, Principal Scientist was appointed to the post of Head, Animal Physiology, NDRI on April 25, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. Rajan Sharma, Principal Scientist was appointed to the post of Head, Dairy Chemistry, NDRI on April 25, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. Suneel Kumar Onteru, Principal Scientist was appointed to the post of Head, Animal Biochemistry, NDRI on April 26, 2023 forenoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. Ashis Kumar Samanta, Principal Scientist was appointed to the post of Head, Animal Nutrition, NDRI on April 26, 2023 forenoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 19, 2023.
- Dr. Deep Narayan Yadav, Principal Scientist was appointed to the post of Head, Dairy Technology, NDRI on May 1, 2023 forenoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated April 25, 2023.
- Dr. Pawan Singh, Principal Scientist was appointed to the post of Head, Livestock Production & Management Division, NDRI on May 1, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated May 1, 2023.
- Dr. J.K. Kaushik, Principal Scientist was appointed to the post of Head, Animal Biotechnology Division, NDRI on May 10, 2023 afternoon vide Council's Memorandum No. 39(7)/2021-Per.-III dated May 10, 2023.

- ♦ Sh. N. K. Arora, Comptroller joined NDRI vide dated April 27, 2023 vide Council Office Order No. Admn./F.No. 17-1/2019-Estt.I dated April 5, 2023.
- ♦ Sh. Prabhjit Singh, Assistant promoted to the Post of Assistant Administrative Officer (AAO) on May 31, 2023 afternoon vide Office Order No. F.6-33/20 /DPC/E-I(S)/e-148786/01-06 dated May 31, 2023.
- ♦ Sh. Pradeep, Assistant promoted to the Post of AAO and joined his duties to the said post of AAO on June 28, 2023 afternoon vide Office Order No. F.6-33/20 /DPC/E-I(S)/e-148786/ 284-293 dated July 5, 2023.
- ♦ Dr. H. R. Meena, Principal Scientist appointed as Head, Division of Extension Education at IVRI, Izatnagar, Bareilly (UP) vide Council Office Order F.No.38(2)/2020-Per. III dated June 16, 2023 and relieved from NDRI, Karnal on June 23, 2023 afternoon.
- ♦ Dr. Ritu Chakravarti, Senior Scientist, Dairy Extension Division, NDRI superannuated from Council's service on June 30, 2023.

## राजभाषा एकक

### संस्थान राजभाषा कार्यान्वयन समिति की बैठक

**भाकृअनुप-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की राजभाषा कार्यान्वयन समिति की दिनांक 26-06-2023 को संपन्न हुई 99वीं समीक्षा बैठक का कार्यवृत्त:**

डॉ. धीर सिंह, निदेशक, भाकृअनुप-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की अध्यक्षता में संस्थान राजभाषा कार्यान्वयन समिति की 1 अप्रैल, 2023 से 30 जून, 2023 तक की तिमाही समीक्षा बैठक दिनांक 26-06-2023 को आयोजित की गयी। बैठक में दिनांक 31-03-2023 को आयोजित पिछली बैठक के कार्यवृत्त पर सघन चर्चा के उपरान्त पुष्टि की गई। साथ ही बैठक की कार्यसूची पर भी विस्तार से चर्चा की गई।



संस्थान राजभाषा कार्यान्वयन समिति की तिमाही बैठक (26-06-2023) की झलक



## हिन्दी कार्यशाला का आयोजन

संस्थान में राजभाषा कार्यान्वयन समिति के तत्वावधान में दिनांक 19-05-2023 को राजभाषा कार्यान्वयन तथा हिन्दी की तिमाही रिपोर्ट भरने में आने वाली समस्याओं के निराकरण विषय पर तिमाही हिन्दी कार्यशाला का आयोजन किया गया। जिसमें 56 अधिकारियों एवं कर्मचारियों ने हिस्सा लिया।



हिन्दी कार्यशाला (19-05-2023) की झलक

## नगरस्तरीय प्रतियोगिताओं का आयोजन

नगर राजभाषा कार्यान्वयन समिति, करनाल के तत्वावधान में दिनांक 25-05-2023 को हिन्दी निबंध प्रतियोगिता एवं दिनांक 26-05-2023 को हिन्दी शब्दार्थ प्रतियोगिता का

आयोजन किया गया जिसमें नराकास, करनाल के 47 सदस्य कार्यालय के अधिकारियों एवं कर्मचारियों ने हिस्सा लिया।

## करनाल नगर राजभाषा कार्यान्वयन समिति की बैठक

नगर राजभाषा कार्यान्वयन समिति, करनाल के अध्यक्षीय कार्यालय के रूप में संस्थान के द्वारा दिनांक 07-06-2023 को नगरस्तरीय छमाही समीक्षा बैठक का डॉ. धीर सिंह, निदेशक, रा.डे.अनु.सं., करनाल की अध्यक्षता में आयोजन किया गया। इस बैठक में समिति के 47 कार्यालयों के कार्यालय प्रमुखों एवं प्राधिकृत अधिकारियों ने भाग लिया।



संस्थान राजभाषा कार्यान्वयन समिति की छमाही बैठक (07-06-2023) की झलक

## SOUTHERN CAMPUS, BENGALURU

### Advisory Services

Advisory services were rendered to fifty clientele through digital media, personal visits to the Institute, phone and mail enquiries. The information request profile of the advisory services comprised, consultancy for establishing dairy farm, scientific management of crossbred dairy cows and Murrah buffaloes, scientific feeding of dairy cows and training programme on processing of milk & milk products.

### Visitors

The profile of visitors to the Institute comprised 558 visitors in 11 batches of 348 students, and 210 farmers, from various districts of the state and neighbouring

states. The visitors were briefed about the on-going research and extension activities and were taken round the Institute as per their needs.

### Outreach Activities

A guest lecture on, 'Nutritional Interventions for Profitable Production in Dairy Farming' was delivered online by the subject matter specialists to 180 participants comprising Dairy Extension Officers, Veterinary Officers, Entrepreneurs and Faculties from SAUs for the Online collaborative Training Programme on 'Dairy Farming- A Profitable Venture' organized by Veterinary College, Hassan, KVAFSU and MANAGE, Hyderabad from June 20 to 22, 2023.

## Sensitization Programme on IYN-2023

Sensitization programme on 'Milk and Millets for Health and Nutrition, as a part of International Year of Millets (IYM 2023), was organized for four batches of undergraduate students of Biotechnology, Veterinary Sciences, Food and Dairy Sciences, on exposure visits to the institute. The students were sensitized by the faculty on the importance of millets, milk and milk products for human health and nutrition and were advised to disseminate the information to their peer and clientele groups. The Sessions were well-attended by 145 students in four batches. Importance of milk and millets for balanced nutrition of farm families was sensitized among the women self-help groups (SHGs) on Exposure visit (50 no.) to the Institute.



## Orientation Programme

An Exposure cum Orientation programme was organized for 80 farmer trainees comprising farmers, farm women and farm youth from Sholapur, Maharashtra under 'Support to State Extension Programmes for Extension Reforms' (SSEPERs) under Agricultural Technology Management Agency (ATMA) scheme. The farmer trainees were made aware of quality milk production, clean milk production and dairy animal health care through lecture presentations in local language by the faculties. A demonstration was done on use of CMT kits for Mastitis Management. Visits were organized to Livestock Research Centre and Experimental Dairy Plant for the benefit of farmer trainees.



## Training Programs Organized

Training program/Student Ready Dairy Work Experience for the benefit of B.Tech II Year Students from College of Food & Dairy Technology, TANUVAS was organized at SRS of ICAR-NDRI during 10.4.2023 to 15.5.2023. A total of 20 students, grouped in to 4 batches underwent practical work experience training on dairy processing and production aspects including the exposure visit to dairy industry.





## EASTERN CAMPUS, KALYANI

### Research

#### Effect of mitoquinone on cryopreservation of Black Bengal buck semen

Ruthi Lalramchansangi, Surajit Das, Debajyoti Sarkar, M. Karunakaran, Mohan Mondal and C. Bhakat

The experiment was conducted to evaluate the impact of Mitoquinone, mitochondria targeting antioxidant on various *in vitro* sperm characters during the cryopreservation of Black Bengal buck semen. Semen ejaculates (n=20/buck) were collected twice a week, pooled, and extended in a Tris-based extender. The samples were then supplemented with Mitoquinone at a concentration of 200nM. After a 3-hour equilibration at 4°C, the samples were frozen and stored in liquid nitrogen (-196°C). The evaluation of *in vitro* sperm characters viz. individual motility, viability, functional membrane integrity and acrosomal integrity, along with lipid peroxidation status was done after equilibration and after freeze-thaw procedure. In both equilibrated and freeze-thawed samples, the M200 groups, showed significant improvement in terms of individual motility, functional membrane integrity and acrosome integrity as compared to control group ( $p < 0.05$ ). Sperm viability was also significantly higher in the M200 groups in cryopreserved samples but not in equilibrated samples. Unfortunately,

MDA level showed only a minor reduction in the treatment groups which is statistically insignificant in both equilibrated and cryopreserved samples. In conclusion, the supplementation of Mitoquinone @ 200nM was observed to improve *in vitro* sperm recovery and therefore, it was found beneficial to supplement Black Bengal buck semen prior to freezing to uplift the current preservation technique.

### Extension Activities

#### Input Distribution Camp under TSP

One input distribution camp was organized under TSP at the ICAR-NDRI-ERS campus on April 20, 2023. In the programme pig feed and poultry feed were distributed among tribal farmers. Through the distribution of poultry feed, a total of 60 farmers and through the distribution of pig feed, 10 farmers were benefitted. During the input distribution session, problems raised by the farmers were also resolved.

Another input distribution camp under Tribal Sub-Plan Project of the Institute was organized on May 18, 2023 at ERS of ICAR-NDRI, in which 13 quintals of pig feed was distributed among 26 tribal farmers. The farmers were from Banamalipara, Sutra, Mahanala, Huda and Ichhapur village of Nadia district. All the farmers were already rearing pigs received from ERS.





## Off-campus Scientist-Farmers Interaction Meeting and Animal Health Camp

ICAR-NDRI, ERS organized and conducted scientist-farmer interaction programme on April 27, 2023 at Chandamari village, Nadia District (WB). A total of 42 farmers participated. ICAR-NDRI, ERS organized one off campus awareness programme on animal health cum vaccination programme with 29 farmers, farm women and youth from South Chandamari village of Chakdah Block of Nadia district.

Beside these, off-campus training was also conducted on "Management of sub-clinical mastitis for dairy cattle" on June 28, 2023. Immunization programme was conducted with three vaccines combination of FMD, HS, BQ in healthy cows. Essential treatments, deworming etc. were also conducted in some animals under C-DAC and SCSP project on that day.



## Training Programme on 'Scientific Dairy Farming'

One training programme entitled 'Scientific Dairy Farming' was organized from May 10-12, 2023. In the training programme a total of 26 trainees participated. The trainee farmers were from the Jhargram district of West Bengal state. The participants of the training were exposed to different aspects of scientific dairy farming like scientific feeding of livestock, health management, housing management etc. The training programme enhanced the capacity of the trainee farmers to rear dairy animals in a scientific way and boost their financial condition.



### Training Programme on 'Artificial Insemination and Veterinary First Aid'

One 32 day training programme entitled 'Artificial Insemination and Veterinary First Aid' was organized from May 16, 2023 to June 16, 2023. A total of 24 youth participated in the training programme. Out of the total 24 participants, 19 trainees were sponsored by AMUL. The participants of the training were exposed to different aspects of AI of dairy animal under field conditions. Both practical and theory classes were conducted in the training programme for capacity building of the trainees.



### Collaborative Interface Meeting cum Workshop with ICAR-ATARI, Kolkata

One interface meeting cum workshop with farmers and para-vets was conducted at ERS of ICAR-NDRI campus on May 23, 2023 in which 50 participants participated. The programme was conducted in collaboration with ICAR-ATARI, Kolkata. In the programme discussion with farmers and para-vets were organized and their problems understood. Suitable solutions to the identified problems were provided by the scientists of ICAR-NDRI and ICAR-ATARI, Kolkata. Apart from that, the mental mapping of the participants pertaining to dairy farming was also done in the interface meeting.



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