एन.डी.आर.आई.

# N.D.R.I. News

jk"V dh Mjh Lolu dh lefir
**Fulfilling Nation's Dairy Dreams**

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**ICAR-National Dairy Research Institute, Karnal**

**www.ndri.res.in** | **Volume 27 No. 2** | **July-September, 2022**

## From the Director's Desk

The contribution of women in all domains brings immense dividends to the country's progress and development. Dairying too offers unlimited opportunities for women to perform and excel. This particularly holds true as women perform more than 70 per cent of dairy farming activities in India. Out of about 80 million dairy farm households, majority are small scale farmers with 2 to 3 animals where women play a key role in care of animals, cleaning cattle sheds, watering, feeding, grazing, milking and health management in addition to several other routine activities and household chores.

Despite predominant contribution of women in dairying, their access to knowledge, skill, credit, extension and marketing are highly constrained in view of prevailing patriarchy in the rural society. Evidence shows that the farm productivity could be raised by 20 to 30 per cent if women are given targeted interventions as they have the greater propensity to apply the learnt techniques with the spirit to reap the timely benefits.

ICAR-National Dairy Research Institute is always a lead Institute in steering the women towards their knowledge and skill up-gradation, which would enable them to generate additional income and in turn result in improving the health and nutrition of their families. Dairy Extension Division, Krishi Vigyan Kendra (KVK) and Regional Stations of NDRI

execute various activities for capacity building of women through training, participatory demonstrations, exposure visits, exhibitions, extension literature, supply of critical inputs, videos, mass media and formation of women groups.

A women empowerment lab established by NDRI trains the women regularly on preparation of value added milk products. Students of Dairy Extension Division undertake research studies concerning the specific needs, models and interventions for women empowerment in dairying. A research project entitled "Improving Livelihood of Rural Women through Dairy based Secondary Agriculture" funded by Department of Science and Technology (DST), Government of India could create zeal and enthusiasm among farm women in formation of ten successful entrepreneurial units in Karnal, Panipat and Sonepat districts of Haryana.

The Project team made efforts to form women groups after gender sensitization meetings in collaboration with development agencies. The Project covered 25 villages, organized 70 trainings/gender sensitization meetings and 60 demonstrations, thereby training 1023 farm women. As a result of the efforts made during the project, there are finally 10 women self-help groups running their units successfully, with several other women groups who are ready and willing to take off. The women have shown considerable preference for traditional dairy products such as paneer, matka kulfi, whey drink, ghee, burfi, kalakand, gulab jamun, curd, coconut burfi etc., due to regular market demand.

Educating farm women about market demand analysis, incentive / credit facilitation and tie-ups with potential market players greatly motivated them to shed their initial fear or hidden hesitation. A monthly earning of Rs. 5000 to Rs.8000/- as income per group member is possible through value added farm enterprises as demonstrated in the project villages. Therefore, a steady investment in capacity building of women in the field of dairying can not only enhance the livelihood of resource poor farm families but also initiate them towards path of achieving Sustainable Development Goals (SDG's) of the United Nation.

**(Dr Dheer Singh)**
**Director, ICAR-NDRI**

## RESEARCH

**Development of Fermented Whey with Enhanced Bioaccessible Iron Content**
*(Dr. Writdhama Prasad, Dr. Kaushik Khamrui, Dr. Pradip Behare and Dr. Sumit Arora)*

Iron binding ability of exopolysachharide (EPS) derived from *Lacticaseibacillus rhamnosus* Kar1 was studied. The Kar 1 culture was propagated in whey medium and EPS produced during the fermentation was extracted and complexed with iron (FeSO4.7H2O). Characterization of EPS-Iron complex was performed using FTIR and SEM imaging. The FTIR transmittance spectra showed the presence of hydroxyl groups (O-H), sulphate group (S-O) and carboxyl group (C=O) on EPS, which were involved in binding iron. Microstructure of EPS changed from porous structure with rough surfaces to flocculent like structure with neat edges upon binding with iron. Stability evaluation of iron complex under different environmental conditions revealed that 88.03-97.08%, 63.44-96.21% and 85.92-97.34% of iron remained in complexed form with EPS Kar1 at heat treatment range of 50°C, 60°C and 70°C/10- 30 min, pH from 2 to 7 and ionic concentration of 0.1 M-0.5 M NaCl, respectively. *In-vitro* bio-accessibility of the iron-EPS complex revealed that more than 50% of iron in complex form was bio-accessible after intestinal digestion.

**Extraction of Milk Fat from Ghee Residue Using Low Toxicity Solvents**
*(Mr. Aakash Dadarao Wani and Dr. Writdhama Prasad)*

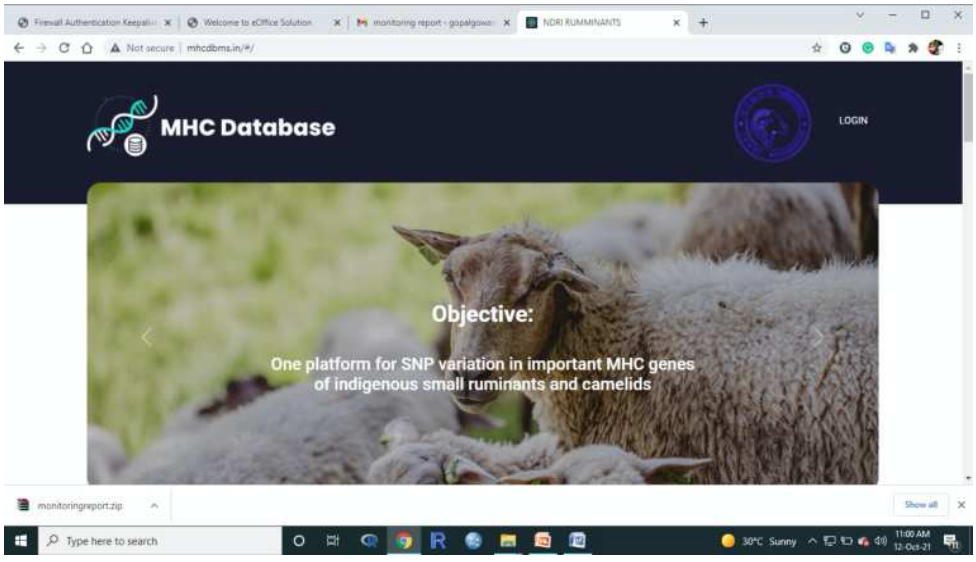
The project was aimed at using green solvents having low toxicity for extraction of milk fat from ghee residue. At present, milk fat is extracted using a combination of hydro-thermal treatment which is energy intensive and generate huge amount of waste water. This project aims to address this issue. It was observed that ethyl acetate could be used for extraction of milk fat at an extraction temperature of 60$^{o}$C. The optimized extraction conditions required lower amount of energy and time, as compared to conventionally used hydrothermal treatment, for milk fat extraction from *Ghee* residue. Further, the FTIR absorbance spectra, DSC thermograph and fatty acid profile of extracted milk fat was similar to that of *ghee.*

**Generation of Indigenous Online "Immuno-Polymorphism Database"**
An online database management system named MHC Database was created (http://www.mhcdbms.in/) to allow easy access and use of immune polymorphism data. This system also allows user to upload as well as download the indigenous *Ovar* MHC allelic database for sheep breeds in *FASTA* format. The database also allows user from Goat and Camels to use the database for uploading or downloading the sequences. Sequences can be submitted and can be retrieved in Fasta format. Sequences are pooled for a breed together. Submission is critically reviewed.

The heterozygous samples are welcome owing to huge variation at MHC. These are good indicators of SNP variation. The IUPAC nomenclatures for codes are used for avoiding any confusion in the reading of the polymorphism at a particular position. Data submitted here can be freely used for further analysis (links provided).

MHC database for sheep, goat and camels

www.mhcdbms.in




Developed at NDRI and located at NDRI server -

**Effect of DFI intervention** **Name of Project:** ***Network Project On Buffalo Improvement (NDRI Field Unit)***

**Name of farmer: DARBARI RAM s/o MOTI RAM**
**Address : P.O. VILLAGE KHERI MAN SINGH, KARNAL (HARYANA)**
**Mobile Number: 07497806490**
**Age : 63 yrs.**
**Education : 10th Pass**
**Size of land holding (in acre): 4 acre**

**1) Before Intervention**

| Component Description | | Benchmark (Baseline period 2016-17) | | | |
|---|---|---|---|---|---|
| Components | Names | Number | Production (Liter/No.) | Gross Income (Rs.) | Net Income (Rs.) |
| Livestock 1 | Murrah Buffalo | 10 (Herd size) 2 (in production, round the year) | 6480 liter | 2,59,200/- | 2,01,200/- |
| Other enterprise (Specify) | Sale of buffalo | 3 | 80,000/ buffalo | 2,40,000/- | 2,40,000/- |
| Total | - | - | - | 4,99,200/- | 4,41,200/- |

**2) Status in 2020**

| Component Description | | Period 2020-21 | | | | % increase over base year | |
|---|---|---|---|---|---|---|---|
| Components | Names | Number | Production (Liter/No.) | Gross Income (Rs.) | Net Income (Rs.) | production | income |
| Livestock 1 | Murrah Buffalo | 08 (Herd size) 2 (in production, round the year) | 8640 liter | 3,45,600/- | 2,62,600/- | 33.33 | 30.51 |
| Other enterprise (Specify) | Sale of buffalo | 2 | 1,20,000/ buffalo | 2,40,000/- | 2,40,000/- | 0.0 | 0.0 |
| Total | - | - | - | 5,85,600/- | 5,02,600/- | - | +13.91 |

**Brief**: The dairy farmer used to get annual income of Rs. 4,41200/- from buffalo keeping. He faced problems like non-availability good quality semen, repeat breeding, high tick infestation etc. in the herd With DFI interventions like providing high genetic merit frozen semen, timely A.I. services, routine application of de-wormer, and supplementation with mineral mixture etc., he is getting annual income of Rs 5,02600/-. In addition, there is cost saving of Rs. 61400/- in the production of milk.

Photo-1

Buffalo with maximum production of 16 kg per day

Photo-1

Buffalo herd

Photo-3

Buffalo going for routine check up at project centre in the village

**Documented by:** Dr. Vikas Vohra, Principal Scientist and Mr. Sandeep Khokhar (T4)

## Institute Technology Management Unit (ITMU)

**Patents Filed -**

| Title of Patent | Inventors | Date | App. Number |
|---|---|---|---|
| Peptide sequences and epitope specific antibodies for detection of bovine Anti-Mullerian hormone (bAMH) | Prasanna Pal, Anjali Aggarwal, Sachinandan De, Rajib Deb, Vinay Joshi and Avijit Haldar | 25/08/2022 | 202111038528 |
| A process for preparation of milk protein fortified eggless muffins | Kaushik Khamrui, Rishi Puri and Writdhama Prasad | 03/02/2021 | 202111004592 |
| A novel method for ghee preparation with lesser energy requirement | Writdhama Prasad, Shubham Kumbhare, Kaushik Khamrui and Shaik Abdul Hussain | 23/12/2021 | 202111060140 |
| A pail for cooling milk simultaneous to milking | Ravi Prakash and Menon Rekha Ravindra | 07/08/2020 | 202011033807 FER issued |

**Patents Granted -**

| Title of Patent | Inventors | Date | No. & Date |
|---|---|---|---|
| Antimicrobial nanoemulsion of clove oil stabilized with milk protein and a process thereof (913/DEL/2015) | Bimlesh Mann, Minaxi, Rajan Sharma and Rajesh Kumar | 31/03/2015 | 401941on 25.07.2022 |
| A milk-protein based nutritive antacid and a process for its preparation (574/DEL/ 2014) | Amit Kumar Jaylalbhai, Patel Ashok Kumar Ambalal Patel and Ram Ran Bijoy Singh | 28/02/2014 | 402839 on 02.08.2022 |
| Stabilization of non-ionic surfactant based nanovesicles loaded wtih resveratrol using stearic acid and method of preparation thereof (201811004766) | Battula Surendra Nath, Vankayala Jaya Sravani, Kandasamy Ruckmani, Mariya Antoniraj Gover Antoniraj, Pushpadass Heartwin Amaladhas, Naik Lakshmana Naik, Franklin Magdaline and Eljeeva Emerald | 08/02/2018 | 404471 on 25.08.2022 |
| A peptide with osteoanabolic and antiresorptive activity (2778/DEL/2013) | Venkatesa Perumal Shanmugam, Suman Kapila and Rajeev Kapila | 20/09/2013 | 405144 on 30.08.2022 |

**Technologies Commercialized**

| Name of Technology/ Know-How | IP Protection (Yes/ No) | Name of Contracting Party | Mode of Partnership | Date of Licensing | Revenue Earned (Rs.) |
|---|---|---|---|---|---|
| Technology for preparation of Curcumin enriched ghee | No | Brahmins Foods India Pvt. Ltd., Vengalloor, Manakkad, Thodupuzha, Kerala | License Agreement | 07.07.2022 | 2 Lakh+ Tax(18%) |
| Total mixed rations | No | Digi Vet Care Pvt. Ltd. | License Agreement | 29.08.2022 | 1 Lakh+ Tax(18%) |
| **Total Revenue Generated-Rs. 2,36000/-** | | | | | |

**Trademark of NDRI Logo -**

| Status | Reg. No. | Journal No | Dated |
|---|---|---|---|
| Accepted and advertised in Trademark Journal No. | 5261386 | 2063-0 | 01.08.2022 |

## BPD Unit

**Consultancy Services Rendered/ BPD Activities**

Student training program for Bachelor's and Master's students from various institutions:

| Sl. No. | Intern's Name | Name of Institution | Bachelor's/ Master's | Duration |
|---|---|---|---|---|
| 1) | Yashika Parashar | Graphic Era University, Dehradun | Master | 6 Months |
| 2) | Srishti | Chandigarh University, Chandigarh | Bachelor | 1 Month |
| 3) | Ankit Gahalyan | Deenbandhu Chhotu Ram University of Science and Technology, Murthal | Master | -do- |
| 4) | Gyan Chand Saini | -do- | -do- | -do- |
| 5) | Pooja Dhamija | -do- | B.Tech. | -do- |
| 6) | Kanchan | -do- | M.Sc. | -do- |
| 7) | Simran | -do- | -do- | -do- |
| 8) | Sandhya Ruhul | -do- | -do- | -do- |
| 9) | Himanshu | Amity University, Noida | M.Sc. | -do- |
| 10) | Chestha Mittal | Thapar University, Patiala | M.Tech. | 15 Days |
| 11) | Bhrat Khattar | Panjab University, Chandigarh | M.Sc. | -do- |
| 12) | Mahima Chugh | -do- | -do- | -do- |

## EVENTS

**Centenary Celebrations at ICAR-NDRI**

Hon'ble Union Minister for Agriculture and Farmers Welfare Shri Narendra Singh Tomar inaugurated year-long programmes of the ICAR-NDRI on the celebrations of 100 years of the premier dairy Institute of the country on July 1, 2022.

He dedicated a pillar, depicting the history of the NDRI, and also an "Oxygen Park" on the occasion. He launched an app "Mahishi Mitra" which will help detect heat among animals with the help of saliva drop. The minister also inaugurated another app for climate-related advisory.

*Hon'ble Union Minister for Agriculture Sh Narender Singh Tomer ji visits Livestock Research Center and unveils the Samriti Stambh during the Inauguration of Centenary Year of ICAR-NDRI*

**Training on "Fodder Production and Feed Management" at Hunder, Leh-Ladakh**

The farmers training program on "Fodder Production and Feed Management" was organized under DST project on "Development of climate resilient and sustainable agri-based systems for better food, feed, nutritional and livelihood security option to farming community of Cold arid region-Ladakh" at Hunder village, Nubra, Leh-Ladakh on September 28, 2022. Ms. Changchuk Lamo, Scientist, ICAR- CAZRI RRS, Leh explained the farmers about the project and urged the framers to adopt the scientific fodder production technologies to meet the fodder demand of livestock. Dr. A.K. Misra discussed the importance of fodder production and its conservation for livestock feeding in the context of climate change and its impact on rural livelihood specifically in cold arid regions of the country. Dr. A.K. Misra further suggested farmers to use scientific fodder production and conservation technologies along with ITKs considering the natural resource base of the region for enhancing the livelihood through dairy production. At the end, critical inputs such as, multi-nutrient block, mineral mixture and deworming medicines were distributed as part of innovative technological interventions. The program was organized in collaboration with ICAR-CAZRI RRS Leh-Ladakh.

- 15 days National training on "Genetic Engineering and Proteomics" was organized by Animal Biotechnology Centre (Course coordinator: Dr. Sachinandan De and Dr. Sudarshan Kumar) from July 4-18, 2022 Under NAHEP Scheme.

**National Workshop on Patent Drafting and Filing Procedure**

Institute Technology Management Unit (ITMU) at ICAR-NDRI organized one-day "National Workshop on the Drafting of Patent Application and Patent Filing Procedure" on August 26, 2022. Two patent experts Mr. Ashish Prabhat and Mr. Subrat Sahu from Delhi Patent Office were invited to guide and inform about the complete procedure of patent application preparation and filing. More than 200 participants from NDRI Karnal and other Institutes attended the workshop. The event was chaired by Dr. M.S. Chauhan, Director, ICAR-NDRI,

Karnal. He said that ICAR-NDRI has filed 80 patent applications since 2006 and out of which 38 have been granted. A publication titled "Achievements in Patents and Technologies Commercialized by ICAR-NDRI" was also released on this occasion. Dr. Dheer Singh, Joint Director (Research) also shared his thoughts and informed that during the last 16 years, ICAR-NDRI, Karnal has commercialized 54 technologies on 120 different occasions and has generated more than Rupees 327.55 Lakhs revenue. On this occasion, Dr. Manju Gerard, Principal Scientist from IPTM Unit, ICAR also shared her thoughts.

Dr. M.S. Chauhan, Director, ICAR-NDRI released the publication entitled "Achievements in Patents and Technologies Commercialized by ICAR-NDRI".


**संस्थान राजभाषा कार्यान्वयन समिति की बैठक**

**भा.कृ.अनु.प.-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की राजभाषा कार्यान्वयन समिति की दिनांक** 23.07.2022 **को संपन्न हुई** 96 **वीं समीक्षा बैठक का कार्यवृत्त**

डा. मनमोहन सिंह चौहान, निदेशक, भा.कृ.अनु.प.-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल की अध्यक्षता में संस्थान राजभाषा कार्यान्वयन समिति की 1 जुलाई , 2022 से 30 सितंबर, 2022 तक की तिमाही समीक्षा बैठक दिनांक 23.07.2022 को पूर्वाह्न 11.00 बजे के साथ संस्थान के पिनाको सभा कक्ष में आयोजित की गयी। बैठक में परिशिष्ट 'क' में दर्शाए गए संस्थान के 14 पदाधिकारी शामिल हुए।

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 कि समिति की पिछली बैठक दिनाक 22.04.2022 को आयोजित की गई थी जिसकी कार्यवृत्त के अनुसार कार्रवाई रिपोर्ट पर चर्चा के उपरान्त पुष्टि की गई। साथ ही बैठक की कार्यसूची पर भी विस्तार से चर्चा की।

छायाचित्र : संस्थान राजभाषा कार्यान्वयन समिति की तिमाही बैठक (23.07.2022) की झलक

## हिन्दी कार्यशाला का आयोजन

संस्थान के डा. एन.एन. दस्तूर सभागार में दिनांक 20.08.2022 को "राजभाषा हिन्दी-नीति, नियम, अधिनियम एवं कार्यान्वयन" विषय पर तिमाही हिन्दी कार्यशाला का आयोजन किया गया। जिसमें 24 अधिकारी एवं कर्मचारी शामिल हुए।


हिन्दी कार्यशाला (20.08.2022) की झलक

## हिन्दी उल्लास महोत्सव 2022

भा.कृ.अनु.प.-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल ने दिनांक 20.09.2022 से हिन्दी उल्लास महोत्सव-2022 का आयोजन किया गया। इसका उद्घाटन दिनांक 20.09.2022 को डा.एन.एन.दस्तूर सभागार में पूर्वाह्न 11.00 किया गया। इस कार्यक्रम की अध्यक्षता संस्थान के निदेशक डा. धीर सिंह द्वारा की गई। उन्होंने इस अवसर पर राजभाषा हिन्दी के प्रति संकल्पवान एवं अध्यव्यसायी होने की बात कही। अपने संबोधन में उन्होंने हिन्दी को सरल, सहज एवं जन उपयोगी भाषा बताया। इस अवसर पर एक शब्दार्थ प्रतियोगिता का भी आयोजन किया गया।

हिन्दी उल्लास महोत्सव-2022 के दौरान दिनांक 22.09.2022 हिन्दी श्रुतलेखन प्रतियोगिता का आयोजन किया गया इसके पश्चात् दिनांक 24.09.2022 को हिन्दी निबंध प्रतियोगिता, दिनांक 27.09.2022 को हिन्दी टिप्पण आलेखन प्रतियोगिता तथा दिनांक 29.09.2022 हिन्दी शोध पत्र पोस्टर प्रतियोगिता का आयोजन किया गया जिनमें संस्थान के वैज्ञानिकों, अधिकारियों, कर्मचारियों एवं शोधकर्ता विद्यार्थियों ने बढ़-चढ़कर हिस्सा लिया।

हिन्दी उल्लास महोत्सव 2022 के दौरान दिनाक 22.09.2022
हिन्दी श्रुतलेखन प्रतियोगिता की झलक

हिन्दी उल्लास महोत्सव 2022 के दौरान दिनांक 29.09.2022
हिन्दी शोध पत्र पोस्टर प्रतियोगिता की झलक

## EXTENSION

**Extension Activities/ Transfer of Technologies**

ICAR-NDRI in collaboration with MANAGE, Hyderabad and Haryana State Agricultural Management and Extension Training Institute, Jind organized two trainings on Natural Farming for gram panchayat pradhans in Karnal district on 05.08.2022 and Panipat district on 10.08.2022 respectively. The experts from Department of Agriculture and Farmers Welfare, Government of Haryana and local ICAR research institutes were utilised for training the panchayat presidents. They were sensitized about the maintenance of soil and water quality parameters for realizing higher farm productivity and were motivated to prepare the bio-stimulants, use of 365 days crop cover, use of indigenous seed, diverse crops and trees, integration of livestock, minimum disturbance to soil and Pest management through better agronomic practices and botanical extracts.

**Training of Farm Women on Preparation of Value Added Milk Products**

About 27 farm women were trained on preparation of value added milk products in Padhana village of Karnal district in collaboration with Haryana State Rural Livelihood Mission on 08.09.2022. Women currently sell their milk to local vendors for Rs 35/litre (cow milk) and Rs. 45/ litre (buffalo milk). They were motivated and trained to prepare the paneer, khoa, ghee, whey drink, channa murghi and coconut burfi. They were exposed to local success stories and business opportunities. They were urged to form Self-help groups for earning higher income with local market tie-ups.

**Organizing Exhibition during World Dairy Summit 2022**

ICAR-NDRI participated in World Dairy Summit 2022 by organising exhibition from 12.09.2022 to 15.09.2022 at Greater Noida, Uttar Pradesh. The event was organized by International Dairy Federation (IDF) and NDDB.

## HONOURS AND AWARDS

**संस्थान को मिला हिन्दी का राजर्षि टंडन पुरस्कार**

भा.कृ.अनु.प.-राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल को भारतीय कृषि अनुसंधान परिषद, नई दिल्ली का वर्ष 2020-21 का राजर्षि टंडन राजभाषा प्रथम पुरस्कार प्राप्त हुआ है यह पुरस्कार राष्ट्रीय कृषि विज्ञान अकादमी के ए.पी. शिंदे सभागार में केंद्रीय कृषि एवं किसान कल्याण मंत्री, श्री नरेंद्र सिंह तोमर ने संस्थान के निदेशक डा. मनमोहन सिंह चौहान को प्रदान किया। राजभाषा हिन्दी में पूरे वर्ष के दौरान किए गए कार्यों के मूल्यांकन के आधार पर संस्थान को राजर्षि टंडन राजभाषा पुरस्कार प्राप्त हुआ है।

राजभाषा हिन्दी में पूरे वर्ष के दौरान किए गए कार्यों के मूल्यांकन के आधार पर पुरस्कार

- Poonam Kashyap, Subhash Solanki, Faiz Akram, Savita Devi, Rakesh Kumar, Tirtha Kumar Datta. Best poster presentation at the 19th Annual Convention and National symposium on Contemporary Technology for Animal Genetic Resource (AnGR) Management organized by SOCDAB and ICAR-NBAGR, Karnal, India (2022).
- Anju Nagpal, Rohit Kumar, Nikunj Tyagi, Jai K. Kaushik, Sudarshan Kumar received Best Poster Presentation Award in Technical Session X of the IV International Conference on ICAAAS-2022 held during June 12-14, 2022 at Himachal Pradesh University, Summer Hill, Shimla, H.P., India.
- Dr. M. Lavanya, Ph.D. Scholar of Veterinary Gynaecology and Obstetrics discipline, ICAR-NDRI pursuing research under the mentorship of Dr. S. Jeyakumar, Principal Scientist (Animal Reproduction), SRS of ICAR-NDRI was selected to receive the prestigious "Prime Minister's fellowship scheme for doctoral research" with the industry partner Virbac Animal Health India Pvt. Ltd. The fellowship has been awarded for her doctoral research programme entitled "Development of a novel Nanofiber-based progesterone releasing intravaginal drug delivery system for controlled breeding in dairy cattle".

## PERSONALIA

### Visits Abroad

**Scientists Training from Foreign Institutions:**

| Sl. No. | Name | Training Institute | Duration |
|---|---|---|---|
| 1) | Dr. Rakesh Kumar, PS, ABT, attended an international training entitled "Sperm epigenetic aging and CRREWs (Chromatin remodeling cofactor, RNA interactors, Readers, Erasers and Writers) signature associated with male fertility in humans under the Bill and Melinda Gates Foundation Funded Project | Wayne State University, Detroit, USA | June 6, 2022 to August 5, 2022 |
| 2) | Dr. M.K. Singh, Sr. Scientist | Institute of Farm Animal Genetics (FLI-ING), Germany | June, 2022 to August, 2022 |
| 3) | Dr. N.L. Selokar, Scientist | -do- | September, 2022 to February, 2023 |
| 4) | Dr. K. Ponnusamy, Principal Scientist under NAHEP-IDP | University of California, Davis, USA | August 15, 2022 to August 29, 2022 |

### Training

Permission was granted to the following administrative/ scientific staff for attending workshop/ seminar/ symposia/ conference/ training during the period July, 2022 to September, 2022:

| Name/ Designation | Title of the Seminar/ Conference/ Training etc. | Period |
|---|---|---|
| Dr. Gautam Mondal, PS | International Conference on Advances | August 22-24, 2022 |

| | | |
|---|---|---|
| Dr. G.S. Meena, Sr. Scientist<br>Dr. Yogesh Khetra, Sr. Sci. | in Agriculture and Food System at Bangalore. | |
| Er. Ankit Deep, Scientist<br>Dr. Hima John, Scientist | Training online on Computer aided design. | July 7.2022 to August 6, 2022 |
| Dr. Kamal Gandhi, Scientist | IDF World Dairy Summit 2022 at Greater Noida (UP). | September 12-15, 2022 |
| Dr. A. Mukherjee, PS<br>Dr. D. Malakar, PS<br>Dr. G. R. Gowane, Sr. Sci. | XIX Annual Convention (SOCDAB) and National Symposium on Contemporary Technology for Animal Genetics Resources at NBAGR, Karnal. | September 21-22, 2022 |
| Dr. Nitin Tyagi, PS<br>Dr. Gopal Gowane, Sr. Sci. Dr. Nishant Kumar, Sr. Sci. | India Animal Health Summit 2022, NASC Complex, New Delhi. | July 6-7, 2022 |
| Dr. Sangita Ganguly, Sci. | Training programme on "Promotion of Biofortification for ensuring Nutritional Security. | July 27-29, 2022 |
| Ms. Priyanka, Scientist | The training program on “Intellectual Property Rights (IPR) organized by National Intellectual Property and Technology Management Unit (ITPM) of ICAR. | August 1-5, 2022 |
| Ms. Priyanka, Scientist | International Conference on Advances in Agriculture and Food Systems towards Sustainable Development Goals. | August 22-24, 2022 |
| Dr. P.S. Minz, Sr. Scientist | Conference entitled "Simulation approach to compare different biogas burner designs" (online). | August 22-24, 2022 |
| Dr. Sachin Kumar, Scientist | Conference on Advances in Agriculture and Food System towards Sustainable Development Goals, UAS, Bangalore. | August 22-24, 2022 |
| Dr. Sachinandan De, PS | Workshop on Training Workshop for Vigilance Officers of ICAR institutes, NAARM, Hyderabad. | August 24-26, 2022 |
| Dr. P.N. Raju, Sr. Scientist | Management Development Programme (MDP) on Market Analytics for Small Business (online). | August 29, 2022 to September 2, 2022 |
| Dr. Sudarshan Kumar<br>Dr. Rani Alex<br>Dr. Rubina K. Baithalu<br>Dr. S. Mukherjee<br>Dr. Sohan Vir Singh | XIX Annual Convention and National Symposium on Contemporary Technology for Animal Genetics Resource (ANGR) Management, NBAGR, Karnal (online). | September 21-22, 2022 |
| Dr. P. N. Raju, Sr. Scientist Dr. Nishant Kumar, Sr. Sci.<br>Dr. Rubina K. Baithalu, Sci. | International Conference on Advances in Agricultural, Veterinary and Allied Sciences for Improving Livelihood and Environmental Security (AAVASILES-2022), University of Kashmir, Hazratbal, Sri Nagar (online). | 28-30 September, 2022 |

**Joining/ Promotion/ Reliving -**

- Sh. Dinesh Nagpal joined the post of CAO on 15.07.2022 (FN) vide Council Office Order Admn.6-4/2021-Estt. I dated 28.04.2022
- Smt. Sunita Chaudhary, PS promoted to the post of PPS vide Council office order No.F.Admn./6-1/2022-Estt.I dated 03.08.2022 and joined the post of PPS vide office order No.F.6-57/20 /E-I(S)/Vol-IV/184-192 dated 03.08.2022
- Sh. Karambir, PS joined the post of PPS vide Council office order No.F.Admn./6-1/2022-Estt.I dated 04.08.2022(FN).
- Smt. Santra Devi, PS joined the post of PPS vide Council office order No.F.Admn./6-1/2022-Estt.I dated 05.08.2022(FN).
- Smt. Parvesh Lata, PS was relieved vide office order No. 13-630/1/E.I(S)/194-204 dated 4.08.2022 to join at CSSRI for the post of PPS F.Admn./6-1/2022-Estt.I dated 03.08.2022.
- Sh. Shyam Lama, PS joined the post of PPS vide Council office order No.F.Admn./6-1/2022-Estt.I dated 05.08.2022 (AN).
- Sh. Avnish Kumar, PA promoted to the post of PS vide office order No.1-139/90/E.I(S)-Vol.I/175-181 dated 4.08.2022(A.N).
- Sh. B.D. Phansal, CAO (SG) NAARM Hyderabad joined the post of Joint Director (Admn.) cum Sr. Registrar on 22.08.2022 at ICAR-NDRI, Karnal vide Council Office Order F.No.Admn./6-1/2019-Estt. Pt. Dated 2.8.2022
- Dr. Ram Singh, PS Joined ICAR-NDRI, Karnal on 5.08.2022(F.N) vide Council Office Order No. 11-1/2022-Pers.I(S) dated 3.08.2022
- Dr. M.S. Chauhan, Director, ICAR-NDRI, Karnal was relieved vide Office Order No. 13-746/20/EI(S)/375-382 dated 26.08.2022 to join the post of Vice- Chancellor, GBPUAT, Pant Nagar.
- Dr. Dheer Singh, Joint Director (Research) assumed the charge of Director(Acting), ICAR-NDRI, Karnal vide office order No. 1-44/2016/EI(S)/Vol. II- 218-233 dated 29.08.2022 and Council Office Order No. 39(1)/2017/Per. III dated 29.8.2022
- Sh. Vivek Purwar, CAO (SG) transferred from ICAR-NDRI, Karnal to ICAR-NARRM, Hyderabad vide Council Office Order F. No.Admn./33-23/2017-Estt. I(Pt. 1) dated 30.08.2022 and relieved from ICAR-NDRI, Karnal vide Office Order No. 13-741/2019/E-I(S)/694-702 dated 16.09.2022.

| **Name/ Designation** | **Approval of the Competent Authority vides endorsement No. 6-35/2022/E-I(S) Vol. 17/730-739 dated 17.09.2022.** |
|---|---|
| Dr. Udita Chaudhary, Scientist, (Agricultural Statistics) | Promotion of the Scientist to the next higher grade in PB-3 [Rs. 15,600-39,100+RGP of Rs. 8,000/- (Revised Research Pay level-12)] and re-designation as Senior Scientist w.e.f. 05/11/2021. |
| Dr. A. Manimaran, Senior Scientist, (Veterinary Pharmacology) | Promotion of the Scientist to the next higher grade in PB-4 [Rs. 37,400-67,100+RGP of Rs. 9,000/- (Revised Research Pay level-13A)] w.e.f. 07/02/2022. |
| Dr. Gunjan Bhandari, Scientist (Agricultural Economics) | Promotion of the Scientist to the next higher grade in PB-3 [Rs. 15,600-39,100+RGP of Rs. 7,000/- (Revised Research Pay level-11)] w.e.f. 05/07/2021. |

## DISTINGUISHED VISITORS

- The Union Minister for Panchayati Raj (State) Honoable Shri Kapil Moreshwar Patil, visited at Animal Biotechnology Centre, NDRI in June, 2022.


- Honorable Union Minister for Agriculture and Farmers Welfare, Shri Narendra Singh Tomar and others ICAR Dignitaries visited ICAR-NDRI, Karnal (with cloned calves) on July 1, 2022.


## SOUTHERN CAMPUS, BENGALURU

**Break-through in Research/ Success Stories/ Promising Technologies**

**Ghee Residue Incorporated Chocolate Dairy Spread**
*(Monika Sharma, Abhishek Singh Kanwar, Devaraja HC and Menon Rekha Ravindra)*

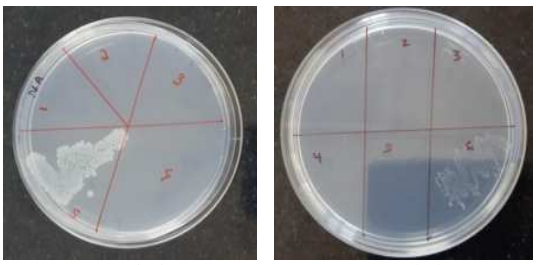
Ghee residue, a nutrient dense mass obtained as a by-product during the preparation of ghee has not been effectively utilized for food product development. One of the popular food segments, where it can be utilized is dairy based spread. The present technology involves the process optimization of chocolate dairy spread incorporated with ghee residue and other milk solids. The levels of various ingredients and processing conditions were optimized through

mixture design and response surface methodology to obtain an acceptable quality chocolate dairy spread. The product had a storage life of 30 days at refrigeration temperature without the addition of any preservatives. Further, the consumer acceptance study revealed that 100% consumers liked the product with more than 91% rated the product as "very good" and "excellent". Thus, it can be concluded that ghee residue was successfully valorized through incorporation in chocolate dairy spread.

**Biogenic Silver Nanoparticles Possess Antibacterial Activity sgainst Calf Diarrhoea Pathogens**

*(Mamta Chuhan)*

Biogenic silver nanoparticles were observed to possess antibacterial activity against calf diarrhoea pathogens. Biogenic silver nanoparticles (Ag NPs) synthesized using panchgavya as reducing agent were observed spherical in shape with average size of 49 nm as determined by Scanning Electron Microscopy. Panchgavya mediated biogenic Ag NPs demonstrated antibacterial properties against *Escherichia coli* and *Proteus mirabilis* bacteria isolated from calf diarrhoea. Minimum Bactericidal Concentration of Ag NPs against *Escherichia coli* and *Proteus mirabilis* was 156.25 and 78.125 µg/ml respectively.



(A) - (B)

Fig.: Minimum bactericidal concentration of panchgavya mediated silver nanoparticles against E.coli (A) and *Proteus mirabilis* (B)

## Extension Activities/ Transfer of Technologies

- **Advisory Services:**
  Advisory services were rendered to fifty-nine clientele through online mode by phone and mail response and during their personal visits to the institute. The advisory profile comprised technical advice for improved green fodder sources, dairy start-ups, commercial dairy farming; cattle feed formulation and purchase profile of Deoni cattle for organic farming.
- **Visitors Conducted:**
  During the period under report, 653 visitors visited the institute, in 13 batches comprising 113 small and progressive dairy farmers from Kerala and 540 students from various educational institutes of Southern States.
- **Outreach Activities:**
  **Farmer FIRST Programme-** An Animal Infertility & Health camp was organized at Yeremgere and Vasappanadoddi project villages, on July 6, 2022 for the benefit of the target beneficiaries. A total of 54 beneficiaries comprising farmers, farm-women and farm youth participated in the programme and 125 dairy animals were brought to the

health camp which included 102 HF cross-bred animals and 23 non-descript indigenous dairy cows, heifers and calves, for general health check-up, conception problems, mastitis and wounds. The input provided includes mineral mixture supplements, preventive and curative medicines for mastitis and wounds, dewormers for the dairy cattle.

**SCSP Program-** As part of celebration of "Azadi Ka Amrit Mahotsav" (75 years of India's Independence Celebrations) a "Field Demonstration cum Distribution of Fruit Saplings and Farmers Interaction Meeting" on was organized on July 2, 2022 under the theme of Nationwide Campaign on "Nutri-Sensitive Agriculture" in collaboration with ICAR-IIHR, Bengaluru.

**Reports/ Recommendations of the important events such as Webinars/ Workshops Seminars/ Symposia/ Conferences/ Training Programmes Organized**

- One day training cum demonstration program was organized on July 22, 2022 to elicit the major problems faced by the farmer- members of the Dairy Cooperative Societies. Further, demonstration of "Milk Quality using Adulterants (preventive/ neutralizer) Test Kits" was organized for tracing the adulterations in milk by Urea, Starch, Sugar by using the Test Kits. Around 300 participants representing Dairy Farmers- Presidents and Secretaries of Dairy Cooperative Societies of Malur, Division of Kolar District in Karnataka State participated in the program. The program was organized by KMF, KOMUL in association with SRS, Begaluru of ICAR- National Dairy Research Institute, Karnal.


- An **On-Campus Training** for thirty-five farmer beneficiaries from the project villages on "Scientific Dairy Management Practices" was organised on July 27, 2022, at SRS of ICAR- NDRI, under **Famer First Programme.**
- SRS, ICAR-NDRI arranged an one day orientation programme for the 20 trainee officers of Audit and Accounts from Regional training Center of Audits and Accounts Department (IA&AD), Bangalore, as part of their mid-career training programme on August 23, 2022.

## EASTERN CAMPUS, KALYANI

### Research

**Supplementation of Exogenous Fibrolytic Enzymes increases growth performance in crossbred calves**

*Anil, T. K. Dutta, A. Chatterjee, Sushil K. Yadav*

The present study was carried out to evaluate the effect of supplementation of exogenous fibrolytic enzymes (EFE) on voluntary feed intake, availability of different nutrients and growth performance in weaned crossbred calves. Fifteen weaned female Jersey crossbred calves were divided equally into three groups; namely, Control ($T_0$), Treatment-1 ($T_1$), Treatment-2 ($T_2$). One growth trial was conducted on these calves for 90 days. Animals in each treatment group were fed *ad libitum* Total Mixed Ration (TMR) (CP 12%, TDN 65%) individually for 90 days. The TMR was prepared with concentrate mixture, chaffed paddy straw and oat fodder at the ratio of 40:30:30 (on DM basis). Calves under control ($T_0$) group were fed *ad libitum* TMR (without EFE). Calves under $T_1$ and $T_2$ were fed *ad libitum* TMR supplemented with EFE cellulase and Xylanase @ 8000 and 16000 IU/kg DM of TMR and with EFE cellulase and Xylanase @ 12000 and 24000 IU/kg DM of TMR, respectively. Significantly greater DMI per unit body weight was recorded in enzyme supplemented groups compared to control group; however, difference between $T_1$ and $T_2$ was non-significant. Addition of EFE in the TMR diet of calves increased DCP intake in $T_1$ and $T_2$ than $T_0$. Similarly, intake of TDN and digestible NDF (DNDF) was also significantly greater in $T_1$ and $T_2$ than $T_0$. DE and ME intakes were also increased due to addition of EFE in $T_1$ and than non supplemented. Average daily body weight gain (ADG, g/d/calf) were estimated greater in $T_1$, $T_2$ than $T_0$. The feed conversion efficiency (FCE, kg live weight gain/100 kg DMI) was 13.80, 14.67 and 14.87 in control, $T_1$ and $T_2$ groups, respectively. However, the difference among three treatments was non-significant. Therefore, it was inferred concluded

that supplementation of exogenous fibrolytic enzymes (cellulase and xylanase @ 8000 and 16000 IU/kg TMR DM) may boost growth potential of finisher Jersey crossbred calves with enhanced intake of different digestible nutrients.

**Enhancement of developmental competence of immature oocytes supplementing with Leukemia Inhibitory Factor as a supplement in culture media**

*Amrita Pramanik, S. Bera, R. Menda, M. Mondal, M. Karunakaran, A. Santra and S.K. Das*
The study was conducted to improve the developmental competence of cattle embryos by supplementing culture media with Leukemia Inhibitory Factor (LIF). For the current study fresh cattle ovaries and oviducts were collected from a local abattoir in 0.9% saline solution (30-35°C) supplemented with antibiotics and were transported to the laboratory within 2-3 h of animal slaughter. These slaughter house ovaries were aspirated to obtain cumulus-oocyte complexes, washed 5–6 times in washing media and cultured in maturation media for 24h in a 5% $CO_2$ incubator at 38.5°C with maximum humidity. After 24 h of culture, matured oocytes were co-incubated with *in vitro* capacitated sperms for fertilization in fertilization Bracket and Oliphant's medium for 15-18 h. After co-incubation, surrounding cumulus cells were stripped off by repeated gentle pipetting and presumptive zygotes were cultured for embryo development in mCR2aa culture medium. After 40 to 42h, cleavage was observed and embryos were cultured for 7-9 days in the same environmental conditions. Culture media used was replaced with fresh media after every 24 h. In this study, leukemia inhibitory factor was supplemented in culture media with three different concentrations *i.e.,* 15, 30, 45 ng/ml. Total 542 cumulus oocyte complexes were used in the study. All data of four replicates were analysed by one way ANOVA (post-hoc Tukey's test). There was significant effect of LIF supplementation on maturation rate, cleavage rate (in control group 71.9±0.6 and 72.2±0.8, 78.1 ± 0.8 and 76.7±0.0 in 15ng/ml, 30 ng/ml and 45 ng/ml respectively). However, addition of LIF during culture increased ($P<0.05$) blastocyst development (in control group 7.0±1.3, and 7.1±1.2, 12.9±0.4, 10.2±1.5 in 15ng/ml, 30 ng/ml and 45 ng/ml respectively) for *in vitro* cattle embryo production.

**Training farmers of Arunachal Pradesh on scientific pig farming**

Scientists of ERS-NDRI, Kalyani trained 66 needy beneficiary farmers of Arunachal Pradesh on "Scientific pig farming" in a programme organized on September 7, 2022 at KVK complex, Namsai. 23 farmers were also distributed with piglets (one each), pig feed (76 kg/farmer), feeders and waterers, mineral mixture, medicines and first aid kit etc. to boost the farming. Old beneficiary pig farmers (43) were also provided with pig feed (76 kg/farmer), feeders and waterers to improve the growth performance of their pigs.

Earlier beneficiary farmers adopted by ERS-NDRI in Arunachal Pradesh increased the population of pigs by 333.3% when they were given piglets along with feeds and other inputs in 2016-17 as direct benefit transfers and they increased profit by 131.3%. Similarly, other group of beneficiary farmers in this state increased poultry population by 185.7% when they were distributed with chicks along with chick feed and other inputs 3 years back with profit enhancement by 124.7%. Therefore, it was observed that backyard type pig or poultry farming increased family income of adopted NEH farmers to support their livelihood.

**Livestock Development Programme at Dhalai, Tripura for Promotion of Goat Farming for Livelihood Security**

Scientist-farmer's interaction meet cum training programme of tribal farmers, Input distribution activities and awareness programme was organized on September 28, 2022 by ICAR-National Dairy Research Institute, Eastern Regional Station, Kalyani, Nadia, West Bengal at the KVK Dhalai district, Tripura. Dr. S K Das, Dr. A.Santra and Dr. A.Chatterjee organized the programme in collaboration with KVK, Dhalai, Tripura. Animal husbandry inputs viz. live goats (55 Nos.), feed for goat (2750 kg), Feeder, Waterer, supplements and mineral mixure were distributed among 55 farmers. There was a scientist- farmer interaction cum training programme on livestock rearing at the area.

*Editorial Board*

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