एनडीआरआई न्यूज़

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

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From the Director's Desk

Indian dairying is witnessing a gradual transformation from "smallholder" to "semi-commercial or commercial" mode of operation with increasing number of cattle and/or buffalo heads per farm. Expanding investment opportunities coupled with increased purchasing power of the consumers and their willingness to pay a premium price to have fresh and hygienic milk and milk products are the factors driving this transformation. Such transformation is expected to improve the quality of the farm produce on one hand and facilitate increased returns on the other hand. However, when a large number of animals is reared under a single roof, it requires an intensive management system by identifying precise requirement of inputs in terms of nutrition, housing, health, labour and environment. Therefore, success of any commercial dairying depends upon the tools and technologies utilized in managing and ensuring optimum health of farm animals, including genetic qualities and welfare. In this direction, the role of sensors, robots and artificial intelligence is immense.

Artificial intelligence (AI) is an all-embracing branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence. AI systems can provide accurate monitoring of the inputs and behavioral aspects of individual cow and help to increase the production level. In near future, use of AI technology in the dairy industry is expected to automate most of the farm processes while generating information based on the farm's operational history. The advantage of this technique lies in its ability to identify and document finer details pertaining to each and every animal in the farm, thus, facilitating identification of any animal with performance and behavioral deviations so that necessary intervention could be applied. With this technology it is possible to automatically record how much individual cow eats, how much she drinks, how much she moves, her body temperature, stress levels, sickness etc.

In India, AI can be much useful to track infectious disease outbreaks, ensure the effective rollout of government schemes, and make insurance claims. On the management aspects, AI can effectively be applied in animal identification (facial recognition and digital identity like animal Aadhaar), estrus detection, health monitoring and ensuring milk quality. The ICAR-National Dairy Research Institute, being a premier dairy Institute in the Asia, since long been working on development of AI based technology for dairy production and processing. Vocalization and muzzle printing based animal identification tools have been developed for precision management of dairy animals. Similarly, an automated sensor-based animal weighing scale that reduces the task of weighing individual animals that is usually done by leading individual animal to a weighing balance was also developed. This weighing

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bridge, based on the weight bearing ability of all the four limbs, can be fitted in the entry of milking parlour and every animal entering the parlour could automatically be weighed and the data is communicated to a server where animals with ensuing lameness will be flagged so that the manager can check the animal and take preventive/therapeutic measures. For identification of animals in estrus, which is a major bottle neck in buffaloes, a wireless sensor network (WSN) based system was developed. This is for the first time in India, a WSN based pedometer with software and algorithm has been developed and validated for its efficacy in cattle and buffaloes. This can be applicable in small holder as well as commercial dairy farming for heat detection for accurate time of breeding. The hardware cost is very low as it is developed indigenously. The software is uniquely designed for Indigenous, crossbred cattle and Buffaloes. This system can also be used for early identification of health disorders as the system documents the normal behaviour and activity, and alerts if any animal shows deviation from normal.

For screening the milk for adulterants, bacterial contamination, antibiotic residues and other milk quality parameters, several tests have been developed by the Institute, which are very handy for use under field conditions. There are a few tests developed based on sensors that can be incorporated in the milk-line of the milking parlors alongwith AI technology for Realtime assessment of milk quality. Sensor based technologies for quality assessment of milk products are also being developed by the Institute. However, there are several areas wherein intensive research is required, which include indigenous development of digital identity of individual animal, robotic milking machines, brushes for added cow comfort, real time health monitoring, robotic system for vaccine administration, and automatic feeders and feed delivery systems in dairy farms.

Being at the top position in milk production in the globe, the responsibility of our researchers is to provide technological support to the farmers and the entrepreneurs to sustain the status quo in future wherein several odds like climate change, shrinking natural resources and limited manpower availability are expected to adversely affect dairying. There is an ardent need for technologies to facilitate transformation from "traditional" to "technology-based" dairying. In this direction, AI and other technologies allowing precision and accuracy when making managerial decisions could help achieve the goal of "smart" dairying.

(M.S. Chauhan)
Director, ICAR-NDRI

RESEARCH

Strip Based Technology for Early Detection of Sub-Clinical and Clinical Mastitis

(Naresh Kumar, Kriti Dua and Bhawani, N)

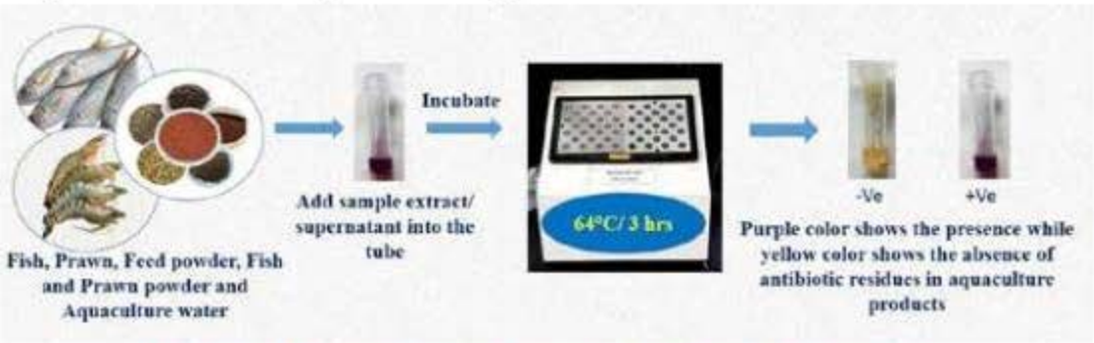
Prevalence of mastitis is one of the major diseases in dairy setting leading to huge economic loss to dairy industry. With growing organized dairy farm sector in India, there is a need to detect it at an early stage. A potential marker was identified in animal suffering from mastitis (sub-clinical/clinical stage) and was found present milk, which was measured on strip based test in real time. Development of blue colour on the strip indicates mastitis in the milking animal. The developed concept is cost effective, user friendly, sensitive, selective and real time. Test protocol includes the dipping of the developed test strip into the fresh milk along with activator and incubation at 40 ± 5°C for 15-30 min. If the colour develops within 15 min, it indicates clinical mastitis and subclinical mastitis with colour development in 30 min. No colour appearance after 30 min indicates normal milk. Test has been evaluated and validated under field conditions.

Sale price: Rs. 6.0 Lakhs + Tax (18.0%) without royalty for 10 years non-exclusive

Spore Based Technology for Rapid Detection of Antibiotic Groups in Aqua-Products

(Naresh Kumar, Ramya S. and Raghu, H. V.)

Usage of antibiotics in milk and other sectors like aqua-products is one of the serious issues leading to antimicrobial resistance in pathogenic bacteria. To address the growing concern of antimicrobial use and resistance development in bacteria, FSSAI and other regulatory agencies have set standards for antimicrobials in different food matrices of animal origin. Spore based kit for detection of antibiotics in aqua-products like Fish, Shrimp, Prawn, Feed powder has been developed. The developed technology is working based on principle of spore germination and its inhibition in presence of antibiotic residues. In case of absence of antibiotic residues, marker metabolites are released during spore's germination, which changes the colour of the indicator. However, in presence of antibiotic residues in aqua-products, the spore germination process is inhibited at ≥ MRL level and no change in colour indicates the presence of drug residues when incubated at 64°C for 3.00 hrs.



Sale price: *Rs. 5.00 Lakhs + Tax (18.0%) without royalty for 10 years non-exclusive terms.*

Multi Seasonal Livestock Housing Module Developed

One multi seasonal housing module was designed and fabricated under NICRA Project considering the seasonal variations in environmental parameters. This module could help to mitigate the effect of external environment on different types of livestock dairy species. This module has three types of modifications:-

1. **Winter Season:** For winter season, this housing module can be modified to restrict the movement of Cold wave / Winds coming from different directions into the animal housing. For this purpose, Shields or Sheets are provided with a fixing and removable arrangement, whereas these shields are not in use they can be fixed on the roof of Animal Housing.

Livestock housing module for winter season with opaque penal

2. **Summer Season:**
   Hot humid season and protection from insects and flies – Nylon fly proof mesh panel is provided with a fixing and removable arrangement. This panel will help in covering the livestock housing from all sides to check or to prevent the entry of flies and insects hence, communicable diseases and other infections can be prevented. During hot humid season, the opaque winter panels and padded panels can be removed and fixed / adjusted on the roof of housing for safe storage. Only the fly proof nylon mesh panels will be used along with air blasting fans can be proven most effective to mitigate the effect of higher Temperature Humidity Index (THI), which is combination of temperature and humidity in the environment.

Livestock housing module fixed with flies proof nylon mesh for hot humid season

Heat waves: For achieving the suitable housing temperature, this housing module is provided with third type of padded panels, which are fixable and removable in the module. The padded panels receive water drops from the drip pipes at the rate of 2 liter/hr for making the padded panel wet.

Livestock housing module fixed with padded panel for hot dry season

These wet padded panels will help to cool down the temperature of hot waves/wind entering into the housing system. This arrangement will act like an air cooling system for whole livestock housing system. This Livestock Housing module will be proven effective in dry hot summer conditions and may be able to maintain the inside temperature within a range of 24°C to 28°C.

Patents Filed

Sr. No.	Title of patent	Inventors	date of filing	Application number
1.	A paper strip sensor for detection of *E.coli* and total plate count in milk using PANI-EPC	Raghu H V., Anjali M. K., Mohit Singh, Bharath G. and Naresh Kumar	15.12.2020	202011054432

EXTENSION

DAIRY EXTENSION DIVISION

KRISHI VIGYAN KENDRA

KVK organized **Soil Health Day** on December 12, 2020 at NDRI, Karnal. The chief guest of the function was Dr. S. K. Pandey (Head SBI Res Station). Dr. A. K. Rai (PS, CSSRI) and Dr. S. K. Gupta (Retired PS) delivered lectures on Soil Health Management. A total number of 79 farmers and staff participated in the event.

KVK organized **Kisan Mela** by celebrating Kisan Diwas on December 23, 2020 at NDRI, Karnal. Dr. P. C. Sharma, Director CSSRI Karnal, was the chief guest and Dr. M. S. Chauhan, Director, NDRI presided over the function. A total of 182 farmers and farm women were present. Farmers and farm women who displayed excellent work in conservation agriculture, crop diversification, integrated farming, dairy farming and milk processing were honored by chief guest.

Other Activities Conducted by KVK

Sr. No.	Activities	Place	Number of farmers/ farm women/ youth	Date
1.	Prabhat Feri against crop residue burning (CRB) and crop residue management (CRM)	Kamalpur Rodan	92	October 6, 2020
		Sirsi	116	October 14, 2020
		Nabipur	97	October 29, 2020
2.	Awareness against CRB and/ or CRM and field visit	Manglore	33	October 13, 2020
		Dabri	45	October 22, 2020
		Naseeb Puram	15	October 22, 2020
		Sultanpur	12	November 21, 2020
		Kamalpur Rodan	14	December 14, 2020
3.	One day awareness programme on *In-Situ* CRM	Nagla Rodan	125	October 24, 2020
		Bansa	65	November, 7 2020
		Parasartirth Behlolpur	50	November 10, 2020
4.	CRM field demonstration	Kamalpur Rodan	12	October 28, 2020
5.	Method demonstration on wheat sowing with zero tillage	Kamalpur Rodan	12	November 6, 2020
		Kamalpur Rodan	18	November 27, 2020
6.	FLD gram field visit organized	Sultanpur	12	November 21, 2020
7.	Field visit and interaction with farmers	Sirsi	16	November 28, 2020
		Sirsi	27	December 11, 2020
8.	CRM and wheat field visit	Sirsi	27	December 11, 2020
9.	Elocution competition against CRB and CRM organised for students at Government Senior Secondary School village	Subhri	97 school students teachers staff	November 12, 2020
10.	Mahila Kisan Diwas	Padhana	70	October 15, 2020
	Total		**955**	

Off-campus Training

Sr. No.	Title of training	Place	Number of farmers/ farm women/ youth	Date
1.	Training program against CRB and CRM	Kachhwa	27	November 24, 2020
2.	Off-campus training on weed management in Rabi crop	Kamalpur Rodan	18	November 27, 2020
		Sirsi	16	November 28, 2020
3.	Training program on NARI	Naseeb Puram	15	October 22, 2020
4.	Two days training programme on women and child care	Kachhwa	15	November 23-24, 2020
5.	फसल अवशेष प्रबंधन एवं रबी फसल उत्पादन की तकनीक	Kamalpur Rodan	30	October 5-8, 2020
		Sirsi	30	October 13-16, 2020
	Total		**151**	

On-Campus Training

Sr. No.	Activities	Place	Number of farmers/ farm women/ youth	Date
1.	मिश्रित मछली पालन	KVK	10	October 5-8, 2020
		KVK	20	October 21-24, 2020
2.	मत्स्यपालन प्रशिक्षण कार्यक्रम	KVK	25	December 16-19, 2020
3.	Crop Diversification	KVK	21	October 17, 2020
		KVK	18	October 19, 2020
		KVK	15	November 3, 2020
4.	फसल अवशेष प्रबंधन एवं रबी फसल उत्पादन की तकनीक	KVK	30	October 20-23, 2020
5.	वैज्ञानिक विधि से पशुपालन में प्रशिक्षण	KVK	15	October 26-30, 2020
		KVK	21	November 2-6, 2020
		KVK	20	November 9-13, 2020
6.	डेरी प्रसंस्करण प्रशिक्षण कार्यक्रम	KVK	20	November 17-21, 2020
7.	दूध के विभिन्न उत्पाद बनाना	KVK	15	December 14-17, 2020
	Total		**230**	

Frontline Demonstrations (FLDs)

- KVK, ICAR-NDRI organized FLDs to encourage farmers to grow oilseeds and pulses in various villages of Karnal district. During the Rabi season 2020-21, a total of 125 FLDs of mustard variety CS58 in 50 Ha area and 54 FLDs on gram variety H.C.-5 in 20 ha area were laid under irrigated conditions to generate the data.
- During the Rabi season, 2020-21, a total of 14 FLDs on Berseem fodder variety B.L.- 43 were conducted in 2.5 ha area of different villages in Karnal district to generate data on the newly released barseem variety.
- During the Rabi season 2020-21, a total of 30 FLDs on wheat varieties i.e. D.B.W.- 187 and H.D.-3226 were laid in 8 ha area under irrigated conditions to generate the data of newly released wheat varieties.

EVENTS

Gandhi Ullas Saptah

Gandhi Ullas Saptah was celebrated at ICAR-NDRI, Karnal from September 25 to October 2, 2020. On this occasion, a tree plantation drive was arranged under the leadership of Director, Dr. Manmohan Singh Chauhan. He said that trees give us fresh air to breathe and food to eat. Trees and plants create a

pleasing and relaxing environment, reflect the harmful rays of the sun and maintain a balanced temperature. They also help in water conservation and preventing soil erosion. Trees also

provide fodder and shade for livestock and thus increase their productivity. He encouraged the staff to make mother earth green and also our children the importance of trees. All the staff members of the Institute planted trees on this occasion.

Webinar on Challenges to Farming Community under COVID-19

National Academy of Agriculture Sciences (NAAS), Haryana Chapter, Karnal in collaboration with ICAR-National Dairy Research Institute (NDRI), conducted a webinar on "Challenges to farming Community under COVID-19 and impact on smallholder farmers: the pandemic threats to livelihoods as well as food security" on October 28, 2020. Under the leadership of Dr. T. Mohapatra, President NAAS, Secretary DARE (GOI) and DG, ICAR, Dr. M. L. Madan, Convener, NAAS Haryana Chapter & Former DDG (Animal Science) convened the Webinar. Dr. M. S. Chauhan, Director, ICAR-NDRI and Dr. A. K. Mohanty, Principal Scientist, ICAR-NDRI, Karnal coordinated the Webinar. Dr. M. L. Madan in the welcome address, briefed about the genesis of the Webinar and how this is going to make farmer centric policies to tackle the effect of pandemic in future. Dr. T. Mohapatra in his inaugural remarks, discussed about the impact of COVID-19 on the farming community in the country and also on the problems faced by the farmers of Northwest India particularly in the state of Haryana, Punjab and Rajasthan. A total of 9 eminent agricultural scientists and administrators in the field of Agriculture and Dairying as well as 3 progressive farmers presented their views and amelioration on the impact of COVID-19 on the problems faced by the farmers, government policies and how to tackle the problem in future. A total of 125 delegates participated in the Webinar. Dr. M. S. Chauhan, Director, ICAR-NDRI discussed in depth the problem faced by dairy farmers and dairy Industries and the losses faced by the farmers. Among other notable speakers were Dr. S. L. Mehta, Ex-Vice Chancellor, MPAU, Udaipur; Dr. Gurbachan Singh, Ex-Chairman, ASRB; Dr. M. L. Jat, Principal Scientist and group leader, CIMMYT, New Delhi; Dr. Suresh Gehlawat, Additional Director, Agriculture Extension, Government of Haryana; Dr. Meenakshi Prasad, Former Head, Animal Biotechnology, LUVAS, Hisar; Dr. Rakesh Tuli, Sr. Research Advisor, Panjab University, Chandigarh; Dr. Gaya Prasad, Ex-Vice Chancellor, SVPUAT, Meerut; Dr. Shalander Kumar, Principal Scientist, CAZRI, Jodhpur and Mr. Vijay Setia, Executive Chairman, All India Rice Exporters Association. Among the progressive farmers who expressed their views were Sh. Bhavneet Singh and Sh. Narjodh Singh. Most of the discussions deliberated that COVID-19 strongly disrupted the supply chain of agriculture and dairy production inputs and outputs. This scenario led to severe losses to farmers, particularly regarding dairy production and the marketing of agricultural produce. To cope with the economic and health stress created by COVID-19, the NAAS, Haryana chapter opined that science and data driven integrated farming, crop diversification and novel marketing

strategies, like e-marketing would be beneficial to the farmers. It was suggested by majority of the experts to prepare robust policies to tackle similar problems in future and investments towards infrastructure build up to tackle farmers problems, farmer education programmes towards marketing of farmers produce etc. In addition, framers need to take care of their health as COVID-19 penetrates into villages. The local governments need to help provide personal protecting tools to farmers.

Symposium on Probiotics and Immunity: Way Forward to Microbial Therapy

5th Biennial Conference of PAi and International Symposium on Probiotics and Immunity: Way Forward to Microbial Therapy was organized on November 19-20, 2020 in virtual mode. The Webinar was inaugurated by the President PAi & Member ASRB, Dr. A. K. Srivastava. In his opening remarks, Dr. Srivastava emphasized on the importance of probiotics in this arena of COVID-19 pandemic and for the most vulnerable elderly population. He further reiterated the importance of milk as the best matrix for probiotics due to the presence of lactose, which act as prebiotic and stimulate the growth of probiotics. Dr. M. S. Chauhan, Director National Dairy Research Institute and Chairman of the Young Investigators oral presentation session, in his opening remarks, drew attention of the scientific community towards the alarming situation due to COVID-19 pandemic and tackling this unprecedented challenge by new innovations and the role of probiotics in improving the overall immunity. Six presentations were made by the young investigators in the first session and were evaluated by a panel of eminent scientists. The second session was chaired by Dr. V. M. Katoch, former Director General, ICMR, he congratulated and appreciated the efforts of PAi and highlighted the efforts of the scientific community to fight against COVID-19. Padma Bhushan awardee Dr. N. K. Ganguly, former DG, ICMR talked about two interventions of probiotics in providing immunity in COVID infections showing promising results. Prof. Brubo Pot, Science Director, Yakult EU deliberated on potentials of probiotics in tackling immunological challenges. Prof. Siew C. Ng, Associate Director, Centre for Gut Microbiota Res, CUHK, Hong Kong presented a case study depicting that COVID-19 patients have gut microbiota dysbiosis and dysbiosis continued even after recovery. Dr. Prakash Halami, Chief scientist, CFTRI, Mysore talked about probiotics as antivirals for the management of respiratory diseases in the context of COVID-19. Dr. Santosh Tiwari talked about antiviral role of probiotics. On this occasion, students Young investigator awards were also announced and Taruna Gupta, Basavaprabhu H. and Preeti Sharma bagged first, second and third positions, respectively. Six participants were also awarded for best poster presentations. The conference was attended by more than 200 scientists and students from different corners of the world.

Group Approach to Enhance Livelihood of Farm Women in Dairying

An interaction meeting was held with two women groups hailing from Panipat and Sonipat districts under DST project "Improving Livelihood of Rural Women through Dairy based Secondary Agriculture" of NDRI on December 12, 2020 under the leadership of Dr. M. S. Chauhan, Director, ICAR-NDRI Karnal. Dr. Chauhan laid emphasis on the concept of "Sabka Sath Sabka Vikas" i.e. all groups from society shall join in dairy production, processing and marketing. Further, he stated that women being important contributors to dairying activities, they can certainly work towards fulfilling the dreams of self-reliance. He also emphasised on the concept of the "Swach Bharat Abhiyan" and overall personal development. Dr. Chauhan advised the women from SHGs groups to maintain hygienic conditions during the preparation and storage of food products with the help of the deep freezers being provided to them. Dr. K. Ponnusamy while welcoming the

participants informed that out of 27 women groups formed under the DST project, ten groups are efficiently working in three districts of Haryana. He further stated that women groups prepare *paneer*, whey drink, *burfi*, *gulab jamun*, curd and *ghee*, depending on the demand in their respective areas.

At the end, Dr. Chauhan distributed deep freezers to two women groups belonging to the SC community, Pragati group from Garhi Sarai and Aarzoo group from Pattikalyana. The

deep freezers would help them to store the value-added milk and milk products that they prepare and assist in improving their livelihood.

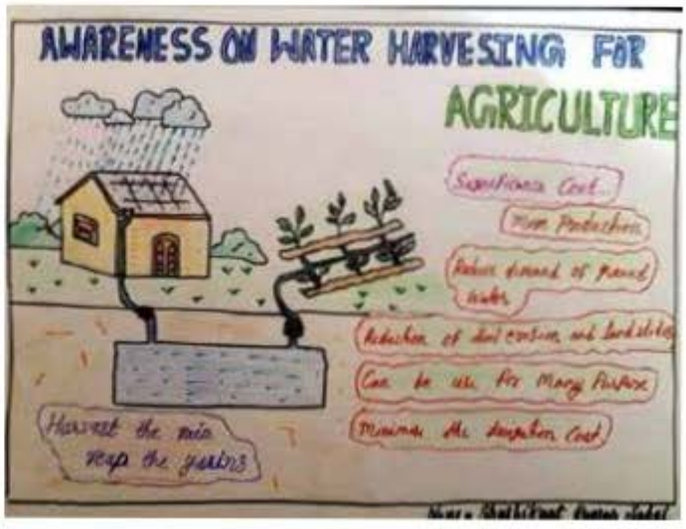
Swachchhta Pakhwada

Swachchhta Pakhwada was celebrated at ICAR-NDRI, Karnal during December 16-31, 2020. Under this programmes following activities were under taken:

- Displayed banners at prominent p1aces and took *Swachchhta* pledge under the leadership of the Director of the Institute.
- Organized cleanliness and sanitation drive within campuses and surroundings including residential colonies, common market places.
- Reviewed progress on weeding out old records, disposing of old and obsolete furniture's, junk materials and white washing/painting.
- Organized campaign on cleaning of sewerage & water lines, awareness on water harvesting for agriculture/ horticulture application/kitchen colonies/ I-2 nearby villages.
- Visited community waste disposal sites/ compost pits, cleaning and creating awareness on treatment & safe disposal of bio-degradable/ non bio-degradable wastes by involving civil/farming community.
- Created awareness on waste management & other activities, including utilization of organic wastes/ generation of wealth from waste, polythene-free status, composting of kitchen & home waste materials,

promoting clean & green technologies and organic farming practices in new area.

- Students participated in assignment with preparation of various posters.



PERSONALIA

Promotions

- Dr. Ashwani Kumar Roy, Sr. Scientist promoted as Principal Scientist w.e.f. 01.01.2015.
- Dr. Nitin Tyagi, Sr. Scientist promoted as Principal Scientist w.e.f. 17.08.2018.
- Dr. Mukesh Bhakat, Sr. Scientist promoted as Principal Scientist w.e.f. 29.08.2018.
- Dr. Goutam Mondal, Sr. Scientist promoted as Principal Scientist w.e.f. 07.09.2018.
- Dr. Suneel Kumar Onteru, Sr. Scientist promoted as Principal Scientist w.e.f. 20.12.2018.
- Dr. Mukund A. Kataktalware, Sr. Scientist promoted as Principal Scientist w.e.f. 26.02.2019.

Joining

Consquent upon his transfer from ICAR-CAZRI, Jodhpur, Dr. Anurag Saxena, Principal Scientist, Agronomy joined NDRI, Karnal w.e.f. 18.12.2020.

Transfer/Retirement/Relieving

- Dr. Priyanka Singh Rao, Scientist, Dairy Chemistry transferred from ICAR-NDRI, Karnal to SRS of ICAR-NDRI, Bengaluru w.e.f. 27.10.2020.

Additional Responsibility

- Sh. Abhishek Rana, SAO assigned the responsibility of CPIO in place of Dr. Meena Malik, Professor w.e.f. 26.11.2020.
- Dr. Diwas Pradhan, Scientist assigned the responsibility of Incharge, Communication Centre w.e.f. 26.11.2020.
- Dr. Archana Verma, Principal Scientist assigned the responsibility of Nodal Officer, Gender Budget Cell w.e.f. 30.12.2020.

DINSTINGUISHED VISITOR

Shri Ajay Tamta, Ex-Union Minister of State, Ministry of Textile, visited Climate Resilient Livestock Research Centre (CRLRC) at ICAR-NDRI, Karnal on November 7, 2020.

HONOURS AND AWARDS

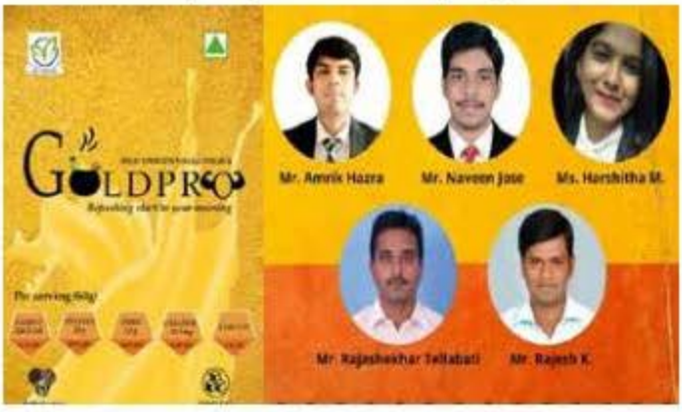
- **ICAR-National Dairy Research Institute, Karnal Ranked First among 72 Agricultural Universities**

  ICAR-National Dairy Research Institute, Karnal has been **ranked first** for the year 2019 among 72 Agricultural Universities of India including State Agricultural Universities, 4 Deemed Universities of ICAR and Central Universities with agriculture faculty by the Education Division of Indian Council of Agricultural Research, New Delhi. This award was declared by the ICAR and presented by Honourable Parshottam Khodabhai Rupala, Union Minister of State for Panchayati Raj, Agriculture and Farmers Welfare. Director of NDRI, Dr. Manmohan Singh

Chauhan, said it was a great moment of pride for the Institute. He added that NDRI has achieved a landmark success for developing several technologies like *in vitro* fertilization, cloning, transgenics, manufacture of a variety of nutritious high quality indigenous dairy products, producing tools for detection of various milk adulterants and also for providing high quality manpower for various dairy development and extension programmes in the country. He said that NDRI is continuously working for the development of all indigenous dairy breeds and helping our farmers to become self-sufficient in the area of dairy farming. Dr. Chauhan congratulated all the staff members of the Institute for their commitment and tremendous efforts in achieving this landmark.

- **Runners-up award in DNA Awards-2020**

Team GoldPro from SRS-ICAR NDRI, Bengaluru bagged the **runner-up position** in the DuPont Danisco Nutrischolars Award (DNA)-2020, Season 3. Their product "**Golden High Protein Shake Premix**" won a cash award of Rs. 25,000 under the "Convenient and Nutritious Breakfast" category of the competition. The ready-to-constitute mix, formulated as a blend of animal and plant protein with added immunity-boosting ayurvedic ingredients, was developed by the team comprising of students of



the Dairy Engineering Section of the station: Mr. Amrik Hazra, Mr. Naveen Jose, Ms. Harshitha M., Mr. Rajesh K., Mr. Rajasekhar Tellabati, The team was mentored by Dr. Menon Rekha Ravindra, Principal Scientist The competition was conducted on a pan India basis, with 170+ teams participating across four different product categories.

- **Dr. Puniya A. K.** (Mentor), Mrs. Pranali Balkishan Nikam, Ms. Neha, Ms. Vaishali Dasriya, Mr. Mohammad Rizwan and Ms. Khushbu Sao received "**Certificate of Winner", 'Nutri-Scholars Award' (2020)** during Academic Year 2020-21 for the project '**Nutripoi with Soymus'** in the category of **QSR Style Lunch/ Dinner** from DuPont Nutrition and Biosciences.
- **Dr. Diwas Pradhan**, Ms. Ganga Gulati, Ms. Anisha Singh, Mr. Saurabh Kadyan, Dr. Rashmi H. M., Dr. J. K. Kaushik and Dr. Sunita Grover received "**Abbvie-Eisai Investigator Award" alongwith a cash prize (600 US$) in the 8th Annual Meeting of Asian Organization for Crohn's & Colitis (AOCC 2020)** held virtually in Busan, Korea from December16-18, 2020 for the oral presentation 'Lipoteichoic acid from probiotic *Lactobacilli* exhibit strain specific anti-inflammatory effects in dextran sodium sulphate induced colitis mice'.
- **Mr. Basavaprabhu H. N.**, Mr. Chette Ramesh, Dr. Rashmi H. M., Dr. Sunita Grover received "**Young Investigator Award (Second)"** for oral presentation on "Unraveling the biotherapeutic potential of live probiotics and para-probiotics as complementary armamentarium to confront the gut mediated infections of Methicillin-Resistant Staphylococcus aureus (MRSA): An in vitro approach" at **5th Biennial Virtual Conference of PAi and International Symposium on "Probiotics and Immunity: way forward to microbial therapy**" held on November 19-20, 2020.
- **Mr. Chette Ramesh**, Mr. Basavaprabhu H N, Dr. Sunita Grover, Dr. Rashmi H M received "**Best Poster Award (First)"** for poster presentation on "Probiotics Derived Biosurfactants: A Novel Postbiotic Candidate with Therapeutic Scaffold to Abrogate the Prevalence of Extended Spectrum Beta-Lactamase *Escherichia coli*" at **5th Biennial Virtual Conference of PAi and International Symposium on "Probiotics and Immunity: way forward to microbial therapy"** held on November 19-20, 2020.
- **Mr. Basavaprabhu H. N.**, Mr. Chette Ramesh, Dr. Rashmi H. M., Dr. Sunita Grover received "**Certificate of Appreciation"** for poster presentation on Biosurfactants of Lactic Acid Bacteria: The Potential Weapons to Tackle the Persistence of Clinical Isolates of Methicillin-Resistant *Staphylococcus aureus* during **AIIMS-ASM 2020 conference on Antibiotic Resistance : Renewed Fight** held on October 7-8, 2020.
- **The Bill & Melinda Gates Foundation grants ($375.00)** to Dr. **Rashmi Hogarehalli Mallappa**, Mr. Amrita Tigga, Mr. E. Shree Niharika, Mr. Santhosh Kumar Muniyaappa, Mr. Saurabh Kadyan, Dr. Diwas Pradhan and Dr. Sunita Grover to present poster on for the **ASM Conference on Rapid Applied Microbial Next-Generation Sequencing and Bio-informatic Pipelines**, held online from December 7-11, 2020.

राजभाषा एकक

संस्थान राजभाषा कार्यान्वयन समिति की तिमाही बैठक

संस्थान के निदेशक डॉ. एम.एस. चौहान की अध्यक्षता में उचित दूरी मानकों को दृढ़ता से पालने करने हुए डॉ. एन.एन. दस्तूर सभागार में 19–12–2020 को तिमाही हिन्दी बैठक का आयोजन किया गया। इस बैठक में संस्थान के सभी पदाधिकारियों व सहायक प्रशासनिक अधिकारियों ने सहभागिता की। बैठक में समिति के पदाधिकारियों की सर्वसम्मति से निर्णित बिन्दुओं पर समय पर कार्रवाई करने तथा संस्थान में राजभाषा हिन्दी के कार्यान्वयन की गति को बढ़ाने का निर्णय लिया गया।

तिमाही बैठक का सोशल डिस्टेन्सिंग के पालन के साथ आयोजन

डेस्क प्रशिक्षणः संस्थान राजभाषा कार्यान्वयन समिति की दिनांक 19.12.2020 को संपन्न तिमाही बैठक के दौरान ही उप निदेशक (राजभाषा) श्री धीरज शर्मा ने वॉइस टाइपिंग सॉफ्टवेयर से हिन्दी टाइपिंग विषय पर समिति के प्रतिभागी पदाधिकारियों को डेस्क प्रशिक्षण भी प्रदान किया तथा हैंड्स ऑन अभ्यास के दौरान सामने आने वाली शंकाओं का समाधान भी किया गया।

नगरस्तरीय राजभाषा गतिविधियां

नगर राजभाषा कार्यान्वयन समिति, करनाल के अध्यक्षीय कार्यालय के रूप में संस्थान के द्वारा 24.11.2020 को नगरस्तरीय छमाही समीक्षा बैठक व वार्षिक नराकास पुरस्कार घोषणा कार्यक्रम डॉ. एम.एस. चौहान, निदेशक, राडेअनुसं, करनाल एवं अध्यक्ष, नराकास, करनाल की अध्यक्षता व गृह मंत्रालय के उप निदेशक(कार्यान्वयन) श्री के.पी.शर्मा जी के मुख्य आतिथ्यि में वीडियो कान्फ्रेन्सिंग के माध्यम से आयोजन किया गया। इस वर्चुअल बैठक में कुल 81 प्रतिभागियों ने भाग लिया। इस कार्यक्रम में नगर राजभाषा कार्यान्वयन समिति, करनाल के तत्वावधान में वर्ष 2019–20 के दौरान उत्कृष्टा हिन्दी प्रकाशन के क्षेत्र में नगर स्तर पर उल्लेखनीय कार्य करने वाले कार्यालयों को सात विभिन्न श्रेणियों में पुरस्कार की घोषणा की गई। राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल को इस आयोजन के दौरान वार्षिक नराकास करनाल राजभाषा पुरस्कार (2019–20) की शोध संस्थान श्रेणी में राजभाषा के क्षेत्र में उत्कृष्ट हिन्दी कार्यान्वयन हेतु प्रथम पुरस्कार, उत्कृष्ट हिन्दी गृह पत्रिका (2019–20) पुरस्कार योजना में "दुग्ध गंगा पत्रिका" को प्रथम पुरस्कार, नगर स्तरीय उत्कृष्ट हिन्दी स्मारिका (2019–20) पुरस्कार योजना में संस्थान की राष्ट्रीय डेरी मेला स्मारिका–2020 को द्वितीय पुरस्कार, उत्कृष्ट हिन्दी बुकलेट/प्रशिक्षण पुस्तिका (2019–20) पुरस्कार योजना में संस्थान की बुकलेट "नवजात एवं छोटे बछड़ों की देखभाल एवं प्रबंधन" को प्रोत्साहन पुरस्कार, नगर स्तरीय उत्कृष्ट हिन्दी फोल्डर(2019–20) पुरस्कार योजना में संस्थान के दो फोल्डरों, प्रथम फोल्डर गेहूँ की अधिक पैदावार के लिए नवीनतम कृषि तकनीक को द्वितीय पुरस्कार व दूसरे फोल्डर नेपियर घास–कम लागत में वर्ष भर हरा चारा को तृतीय पुरस्कार, नगर स्तरीय उत्कृष्ट हिन्दी समाचार पत्रक/न्यूज लैटर (2019–20) पुरस्कार योजना में संस्थान के हिन्दी न्यूज लैटर डेरी समाचार को तृतीय पुरस्कार प्रदान करने की घोषणा की गई।

फार्मर्स फर्स्ट परियोजना के तहत क्षेत्र दिवस एवं प्रशिक्षण कार्यक्रम का आयोजन

राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल ने क्षेत्र दिवस एवं प्रशिक्षण कार्यक्रम का आयोजन करनाल जिले के गांव नगला रोडान में फार्मर्स फर्स्ट परियोजना के तहत किया गया। इसमें लगभग 200 किसानों ने भाग लिया। इस अवसर पर कृषि प्रदर्शनी का भी आयोजन किया गया। इस में गेहूं की सबसे अच्छी किस्मों के बारे में तथा पशुपालन सम्बंधित तकनीकों को दर्शाया गया। सस्थान के निदेशक डॉ. मनमोहन सिंह चौहान का संदेश किसानो को दिया गया। जिसमे बताया गया की फसल और पशुपालन के द्वारा किस प्रकार से किसानो की आय को

दुगुना किया जाये। यह कार्यक्रम फार्मर्स फर्स्ट परियोजना के तहत करनाल जिले के पांच गावों समौरा, गढ़ी गुजरान, चूरनी जागीर, कमालपुर रोड़ान तथा नगला रोड़ान में लगभग 1000 किसान परिवारो पर चल रहा है। जिसमे फसल पशु, फल तथा सब्जी, प्राकृतिक संसाधनों का प्रबंधन आदि पर किसानो को नई तकनीकों से अवगत कराया जा रहा है जिससे किसानो के आय में वृद्धि हो। इस अवसर पर परियोजना लीडर डॉ गोपाल सांखला ने विस्तरित रूप से विभिन्न कार्योकलापो का किसानो को ब्यौरा दिया तथा आगामी गतिविधियों से किसानो को अवगत कराया। इस अवसर पर विषय विशेषज्ञ डॉ. एस. के. पांडये, अध्यक्ष, गन्ना प्रजनन संस्थान, करनाल ने गन्ने की खेती में आने वाली समस्याओं का समाधान बताया तथा डॉ. रामनिवास यादव ने बताया कि अगर किसान कुछ सावधानी बरतें तो बीज का उत्पादन स्वयं कर सकता है। जिससे खेती में लागत में कमी आएगी। इस अवसर पर डेरी विस्तार विभाग के डॉ. केहर सिंह कादियान ने किसानों से कहा की नई तकनीकों को अपना कर किसान कम लागत में अधिक लाभ काम सकते हैं इस अवसर पर डॉ आशीष कुमार सिंह ने महिलाओं को दूध उत्पादन के बारे में विस्तार से बताया। इस अवसर पर गांव के सरपंच श्री मनीष लाठर ने राष्ट्रीय डेरी अनुसंधान संस्थान के निदेशक तथा उनकी टीम को धन्यवाद दिया। इस अवसर पर संस्थान के विवेक पुरवार, संयुक्त निदेशक (प्रशासन) तथा वित् नियंत्रक श्री डी. डी. वर्मा भी मौजूद थे।

राष्ट्रीय डेरी अनुसंधान संस्थान के निदेशक डॉ. एम. एस. चौहान की अध्यक्षता में वर्चुअल हिन्दी उल्लास माह व वार्षिक राजभाषा पुरस्कार वितरण समारोह का आयोजन किया गया। कार्यक्रम के दौरान अपने अध्यक्षीय संबोधन में डॉ. चौहान ने भाषा को संवाद व अभिव्यक्ति का सशक्त औजार बताते हुए ईऑफिस मॉड्यूल पर भी हिन्दी का प्रयोग बढ़ाने का आह्वान किया। निदेशक डॉ. चौहान ने संस्थान में राजभाषा हिन्दी के प्रचार, प्रसार व कार्यान्वयन की दिशा में कार्यान्वित की जा रही गतिविधियों व योजनाओं का उल्लेख करते हुए बताया कि हिन्दी उल्लास मास के दौरान संस्थान के वैज्ञानिकों, तकनीकी, प्रशासनिक, मंत्रालयिक व कुशल श्रेणी के लिए विभिन्न प्रतियोगिताओं का आयोजन किया गया। हिन्दी उल्लास पर्व के दौरान मासिक हिन्दी हस्ताक्षर अभियान, ऑनलाइन हिन्दी कविता पाठ, हिन्दी निबंध प्रतियोगिता, हिन्दी नोटिंग प्रतियोगिता, नगर स्तरीय वर्चुअल हिन्दी कार्यशाला, गांधी स्मृति हिन्दी व्याख्यान माला एवं ऑनलाइन हिन्दी शोध–पत्र पोस्टर प्रदर्शन प्रतियोगिता का आयोजन किया गया। इसके अलावा पिछले वित्तीय वर्ष में वार्षिक हिन्दी मूल हिन्दी टिप्पणी आलेखन प्रतियोगिता, वार्षिक हिन्दी ईमेल प्रोत्साहन प्रतियोगिता, उत्कृष्ट प्रभाग व अनुभाग प्रतियोगिता, अधिकारियों की वार्षिक हिन्दी श्रुतलेखन प्रतियोगिता, संस्थान राजभाषा गौरव पुरस्कार प्रतियोगिता के परिणामों की घोषणा भी की गई। राजभाषा के क्षेत्र में उत्कृष्ट कार्य हेतु उत्कृष्ट प्रभाग का पुरस्कार डेरी सूक्ष्मजीवाणु प्रभाग को, उत्कृष्ट अनुभाग (वैज्ञानिक) का पुरस्कार चारा उत्पादन अनुभाग को तथा उत्कृष्ट अनुभाग(प्रशासनिक) का पुरस्कार स्थापना 4 अनुभाग को प्रदान करने की घोषणा की गई। अधिकारियों द्वारा हिन्दी में श्रुतलेखन देने वाले चार अधिकारियों मुख्य प्रशासनिक अधिकारी विवेक पुरवार, वित्त नियंत्रक डी.डी. वर्मा, डेरी सूक्ष्म जीवाणु प्रभाग की भूतपूर्व अध्यक्षा डॉ. सुनीता

ग्रोवर, भूतपूर्व कुलसचिव सुशांत साहा को प्रशस्ति प्रमाणपत्र से सम्मान के लिए चुना गया। इसी प्रकार राजभाषा हिन्दी के प्रचार, प्रसार व कार्यान्वयन की दिशा में सराहनीय योगदान हेतु डॉ. सुनीता ग्रोवर, डॉ. महेन्द्र सिंह, डॉ. राकेश कुमार, डॉ. निशान्त कुमार, डॉ. नीलम उपाध्याय, प्रेम कुमारी मैहता, सीमा रानी तथा लखविन्द्र सिंह को संस्थान राजभाषा गौरव प्रमाणपत्र से सम्मानित किया गया।

राष्ट्रीय संविधान दिवस का आयोजन

राष्ट्रीय डेरी अनुसंधान संस्थान के निदेशक डॉ. एम.एस. चौहान की अध्यक्षता में राष्ट्रीय संविधान दिवस का आयोजन किया गया। इस अवसर पर पूर्वाह्न में संस्थान के सभी प्रभागों के वैज्ञानिकों व स्टाफ ने कोविड संबंधी निर्देशों की पालना करते हुए संविधान की उद्देशिका को पढ़ कर आत्मार्पित करने का संकल्प लिया। अपराह्न में वेबिनार के माध्यम से आयोजित वर्चुअल व्याख्यानमाला में अध्यक्षीय संबोधन में निदेशक डॉ. एम.एस. चौहान ने संविधान दिवस की बधाई देते हुए कहा कि हम विश्व के सबसे बड़े लोकतंत्र के स्वच्छंद नागरिक हैं और देश के एक सच्चे नागरिक के रूप में हमारे लिए आज का दिन संविधान के महत्व को एक बार फिर से स्मरण करने, मन में इसे पुनः दोहराने, आत्ममंथन करने का दिन है। राष्ट्र के नागरिक व संविधान परस्पर पूरक हैं तथा संविधान लोगों को उतना ही सशक्त बनाता है जितना कि नागरिक संविधान को सशक्त बनाते हैं। व्याख्यान माला में

कुरूक्षेत्र विश्वविद्यालय के विधि विभाग के डॉ. अमित लूदरी ने मुख्य वक्ता व मुख्य अतिथि के रूप में बौद्धिक विकास में मौलिक अधिकारों की भूमिका जैसे महत्वपूर्ण समसामयिक विषय पर व्याख्यान दिया। उन्होंने संविधान की संरचना, उसके आयाम, मौलिक अधिकारों के महत्व व प्रयोग पर विस्तार से बोलते हुए व्याख्यान के अंत में प्रतिभागियों के प्रश्नों के उत्तर भी दिए।

कृषि विद्यार्थियों से केंद्रीय कृषि मंत्री श्री नरेंद्र सिंह तोमर का सीधा संवाद

केंद्रीय कृषि एवं किसान कल्याण, ग्रामीण विकास, पंचायत राज और खाद्य प्रसंस्करण उद्योग मंत्री श्री नरेंद्र सिंह तोमर ने कहा है कि कृषि के छात्र अपने ज्ञान व ऊर्जा को मनपूर्वक उन्नत खेती के लिए लगाएं और किसानों के मददगार बनें। ऐसा करके कृषि के स्नातक देश की तकदीर–तस्वीर बदल सकते हैं। श्री तोमर ने नए कृषि सुधार कानूनों को किसानों के लिए हर तरह से लाभकारी बताते हुए छात्र–छात्राओं से इनका अध्ययन करने तथा इनके प्रति जागरूकता फैलाने का आव्हान 21 दिसंबर 2020 को किया।

इस सीधा संवाद में देश के 74 कृषि विश्वविद्यालय के 15 हजार से ज्यादा विद्यार्थी आनलाइन जुड़े थे। इस दौरान असम कृषि वि.वि. की छात्रा सुश्री रूपशिखा बरूआ ने कहा कि भारत सरकार की नई योजनाओं के बारे में इस कार्यक्रम के माध्यम से उन्हें बेहतर जानकारी मिली है। बेंगलुरू में अध्ययनरत बिहार निवासी छात्र श्री प्रियांशु कुमार ने कहा कि वे किसानों को सीधे मार्केट से जोड़ना चाहते हैं। जेएनकेवीवी की छात्रा सुश्री श्रेयासी सिंह ने कहा कि कृषि क्षेत्र मजबूत होने से देश मजबूत होता है, इसीलिए वे भी इस फील्ड में आई है। पंजाब कृषि वि.वि. की सुश्री अनुपमा ने बताया कि पढ़ाई पूरी होने के बाद अब वे टैरेस गार्डन प्लानिंग के काम में जुट गई है। नए रिफार्म्स को उन्होंने अच्छा बताया।

मुख्य संबोधन में श्री तोमर ने कहा कि हमारे कृषि प्रधान देश में कृषि व गांव भारत की पहचान है। हमारे गांवों की मजबूती से ही हम आत्मनिर्भर बना सकते हैं। आजादी के पहले व बाद में भी कृषि व ग्रामीण क्षेत्र को प्रभावित करने की कोशिशें हुई, लेकिन वे सफल नहीं हो पाई। कोरोना संकट के दौरान भी ये दोनों क्षेत्र पूरी ताकत से खड़े रहे व जीडीपी में भी कृषि का योगदान प्लस में रहा, कृषि क्षेत्र ने अपनी प्रासंगिकता को सिद्ध किया है, यह हमारी बहुत बड़ी पूंजी है।

श्री तोमर ने कहा कि हमारे देश में छोटे रकबे वाले किसान बड़ी संख्या में है, वे प्रकृति पर निर्भर रहते हैं। कुछ ऐसे क्षेत्र भी है, जहां खेती नहीं की जा सकती। कृषि विद्यार्थियों का इसमें सकारात्मक योगदान हो सकता है। आय वृद्धि के लिए महंगी फसलों को उगा सकते हैं, वैश्विक मानकों के अनुसार खेती कर सकते हैं। इस तरह देश के काम आ सकते हैं, निर्यात कर सकते हैं। युवा–छात्रों के प्रयासों से किसानों के जीवन में क्रांतिकारी बदलाव आएगा। सरकार व आईसीएआर कृषि शिक्षा

बढ़ाना चाहते है, इसकी बेहतरी के लिए मंत्रालय सतत मंथन कर रहा है।

केंद्रीय मंत्री ने कहा कि छोटे किसानों को संगठित करके एग्रीकल्चर ग्रेजुएट फील्ड में जाएंगे तो एफपीओ के माध्यम से भी किसानों के जीवन में बदलाव ला सकते हैं और नौकरी से ज्यादा कमाते हुए समाज को आगे बढ़ाने में भी अपनी भूमिका का निर्वहन कर सकते हैं। प्रधानमंत्री जी के वोकल फार लोकल के आव्हान को भी हम सभी को दृष्टिगत रखना है। इस बारे में काफी जागरूकता आई है। स्थानीय उत्पाद बनें, इसमें कृषि छात्रों का ज्ञान जुड़े, आपकी ऊर्जा व परिश्रम से आपके जिले को एक नई ऊंचाई मिले, इससे विद्यार्थियों को आत्मसंतुष्टि भी मिलेगी। खाद्यान्न की बर्बादी रोकने में भी कृषि छात्रों का योगदान आवश्यक है।

उन्होंने कहा कि सरकार द्वारा बनाए गए नए कृषि कानूनों से किसानों को उनकी उपज का वाजिब दाम मिल सकेगा, छोटे किसान भी महंगी फसलों की ओर आकर्षित होंगे, नई तकनीक से जुड़ेंगे, जिनसे उन्हें काफी लाभ मिलेगा। इन कानूनों की लंबे समय से प्रतीक्षा की जा रही थी। श्री तोमर ने स्वामी विवेकानंद जी की बात पुनः उदद्धृत करते हुए कहा कि भारतीय ग्रामों का विकास खेती के उचित नियमों व कानूनों के द्वारा किया जा सकता है। इन नए कानूनों को एग्रीकल्चर स्टूडेंट्स को भी पढ़कर इनके प्रति जागरूकता बढ़ाना चाहिए।

कार्यक्रम में केंद्रीय कृषि राज्यमंत्री श्री परषोत्तम रूपाला, लद्दाख के सांसद श्री जम्यांग त्सेरिंग नामग्याल तथा आईसीएआर के महानिदेशक डॉ. त्रिलोचन महापात्र ने भी संबोधित किया। संचालन व आभार प्रदर्शन आईसीएआर के उप महानिदेशक डॉ. आर. सी. अग्रवाल ने किया। इस अवसर पर आईसीएआर के अंतर्गत संचालित काजरी संस्थान (लद्दाख) में नवनिर्मित लेबोरेटरी व रिसर्च ब्लाक–प्रशासकीय भवन का शुभारंभ श्री तोमर द्वारा किया गया।

किसान दिवस का आयोजन

भारत सरकार ने 23 दिसंबर 2001 से प्रतिवर्ष इस दिन को किसान दिवस के रूप में बनाने का फैसला लिया इसी दिन भारत के पांचवें प्रधानमंत्री चौधरी चरण सिंह का जन्म हुआ जिन के सम्मान में यह दिन मनाया जाता है। कृषि विज्ञान केंद्र करनाल ने इस वर्ष किसान दिवस बड़ी धूमधाम से बनाया जिसका विशेष आकर्षण किसानों को स्मृति चिन्ह देकर सम्मानित करना रहा इस कार्यक्रम के मुख्य अतिथि डॉ. पी. सी. शर्मा, निदेशक, केंद्रीय मृदा लवणता अनुसंधान संस्थान, डॉ. एम. एस. चौहान, निदेशक, राष्ट्रीय डेयरी अनुसंधान संस्थान, डॉ. धीर सिंह, संयुक्त निदेशक, डॉ वी के अरोड़ा, डॉ. आर. एस. छोकर, डॉ एस. के. सिंह, डॉ अनुज कुमार एवं डॉ. राकेश कुमार, अध्यक्ष, कृषि विज्ञान केंद्र सहित लगभग 175 प्रतिभागियों ने इसमें हिस्सा लिया।

डॉक्टर चौहान, निदेशक, राष्ट्रीय डेयरी अनुसंधान संस्थान ने इस एक दिवसीय कार्यक्रम के माध्यम से वैज्ञानिक तरीकों से खेती करने पर और खेती में विविधीकरण करके आय बढ़ाने की ओर भी संकेत दिए। उन्होंने सभी को प्रेरणा दी कि अपना, अपने परिवार, अपने वातावरण, अपने क्षेत्र, अपने राज्य और अपने देश का ध्यान रखने के लिए यह महत्वपूर्ण है कि फसल अवशेष प्रबंधन किया जाए।

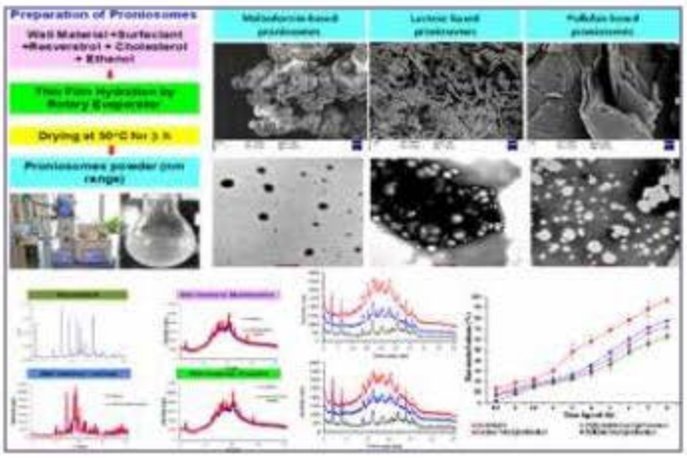
SOUTHERN CAMPUS, BENGALURU

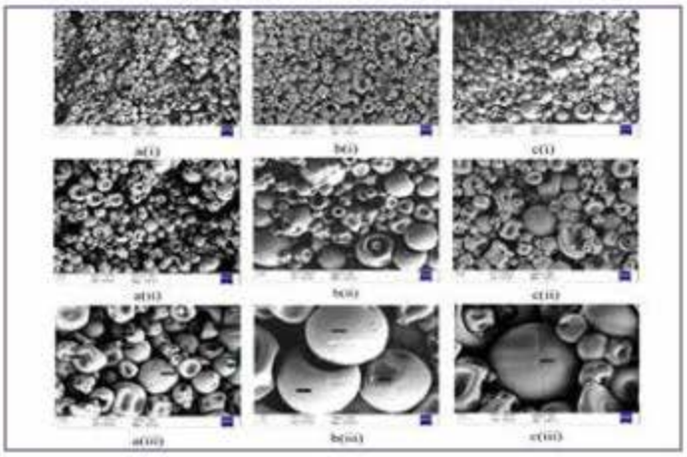
RESEARCH

Resveratrol-loaded Proniosomes: Formulation, Characterization and Fortification

(Shruthi, P.A., Heartwin A. Pushpadass, Magdaline Eljeeva Emerald, F., Surendra Nath, B. and Laxmana Naik, N.)

Resveratrol was encapsulated into proniosomes with the aim of enhancing its applications in food. Maltodextrin, lactose monohydrate and pullulan were used as wall materials for the preparation of resveratrol-loaded proniosomes by thin-film hydration technique. The moisture content of the proniosomes was less than 0.1%, while the whiteness index ranged from 85.37 to 90.66. The bulk density and particle density ranged from 303 to 625 kg/m^3 and 1170 to 1330 kg/m^3, respectively. The Hausner's ratio varied from 1.08 to 1.6, while Carr's compressibility index ranged from 7.59 to 28.03, which was suggestive of poor flowability of proniosomes. Maltodextrin-based proniosomes were smooth and spherical shaped while lactose and pullulan-based proniosomes were flaky with sharp edges. The maltodextrin-based niosomes had the lowest hydrodynamic diameter of 168.73 nm, zeta potential of -29.6 mV, entrapment efficiency of 90.11%, and release of 21.8% at 2 h and 78.2% after 8 h in gastric and intestinal conditions, respectively. Fourier-transform infrared spectroscopy and X-ray diffractometry confirmed successful encapsulation of resveratrol. The antioxidant activity of maltodextrin and lactose-based resveratrol-loaded proniosomes was comparable to that of pure resveratrol. Milk and yogurt fortified with resveratrol-loaded proniosomes did not exhibit any adverse effect on organoleptic qualities.

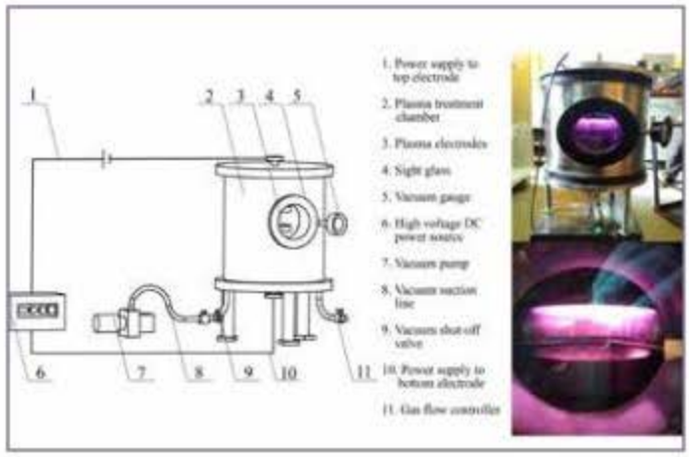




Cold Plasma-Vacuum Packaging Treatment for Shelf-Life Enhancement of Indian Cottage Cheese

(Aditya Sukumar P, Heartwin A. Pushpadass, F. Magdaline Eljeeva Emerald and B. Surendra Nath)

Combination of cold plasma treatment and vacuum packaging were used to enhance the shelf life of paneer. A cold plasma unit, which could generate plasma at partial vacuum (630 mm of Hg), operating at voltage levels of 10-30 kV (DC) and 0.01-0.02. A current was fabricated. Paneer cubes of 1, 1.5 and 2 cm sides prepared from cow milk were treated with cold plasma generated at 15, 20 and 25 kV at exposure times of 1, 3 and 5 min. Even though significant moisture loss occurred in the treated paneer (depending on the sample size and exposure time), no major changes were observed in its titratable acidity, whiteness index, hydrolytic rancidity (FFA) and thiobarbituric acid reactive substances (TBARS) value after treatment. The lowest microbial load of 150 CFU/g was reported for 1 cm sized

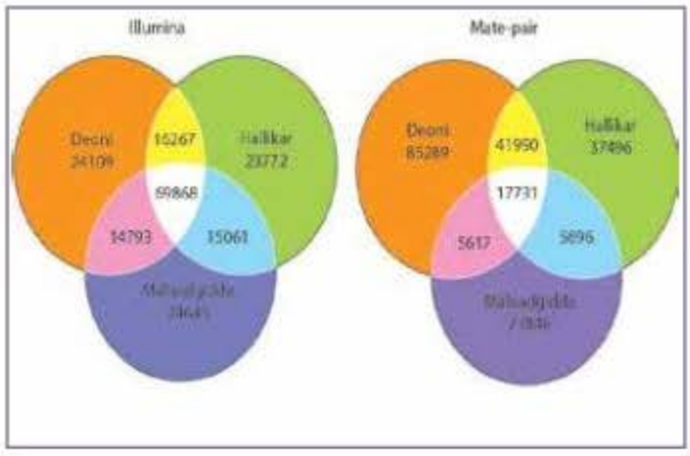


cubes treated at 25 kV for 5 min as compared to 2570 CFU/g in fresh paneer. The cold plasma treatment conditions for paneer were optimized. Paneer treated using the optimized cold plasma conditions were vacuum packed and stored for a period 15 days under refrigerated conditions of 8-10°C. Significant increase in total plate count was observed in the untreated sample, while only a slow and steady increase was observed in cold plasma-treated samples.

Whole Genome Sequencing, *De-novo* Assembly and Integrated Annotation Reveals High Degree of Genetic Diversity among Malnad Gidda, Deoni and Hallikar Breeds of *Bos Indicus* Cattle

(K. P Ramesha, N. Azharuddin, S. K. Behera, L. N. Thota, S. Jeyakumarand Keshav Prasad)

With an aim to identify the genetic diversity among Malnad Gidda, Deoni, and Hallikar breeds, sequencing of whole genome and variations with reference to *Bos taurus* cattle was carried out. The sequencing of paired-end (70X) and mate-pair reads (20X) were performed on an Illumina HiSeq-2500 platform for Malnad Gidda, Hallikar and Deoni breeds. Further, for Malnad Gidda cattle, long read genomic sequences were obtained using PacBio (10X). Augustus tool predicted a total of 58,795, 61,366 and 62,198 genes in Malnad Gidda, Deoni and Hallikar breeds, respectively. Total protein coding genes identified in Malnad Gidda, Deoni and Hallikar cattle were 36,823, 38,175 and 39,012, respectively. Unique/novel genes identified with respect to *Bos taurus* reference genome was 171, 132 and 144 in Malnad Gidda, Deoni and Hallikar, respectively. Observation on non-synonymous base changes revealed that a total of 23,092 genes were associated with 16,543 and 18,010 non-synonymous SNP's in Deoni and Hallikar cattle respectively. A total of 24109, 23772, 24645 variations identified in protein coding regions specific to Deoni, Hallikar and Malnad Gidda cattle breed and 69,868 common variations to above 3 breeds were identified in protein coding genes (Fig).The present findings in sequence diversity may provide the valuable resources to discover molecular mechanisms related to milk production, fertilityand immunity traits in indigenous cattle.



Development of Finger Millet Incorporated Composite Dairy Spread

(Omkar, D. T., K. Jayaraj Rao, B. C. Ghosh, Devaraja H. C. and F Magdaline Eljeeva Emerald)

Among millets, finger millets are of great significance. The most striking features of finger millet are its high calcium content (344-350mg/100g grain), high phyto-chemical content, like polyphenols (0.3-3%) and dietary fibre (18%). Development of dairy spreads with the supplementation of malted millets would lead to a balanced nutritional profile in the product. The fat, protein, ash, carbohydrate, crude fibre and calcium content of the developed composite dairy spread were found to be 47.82% 53.37%, 23.13%, 15.92%, 2.19%, 5.37, 298mg/100g and 107.02mh/100g, respectively. The developed spread packaged in flexi tubes (PE/Al/PE) kept well for a week at ambient temperature (28° C). The approximate

cost of production of the developed composite dairy spread was Rs. 235 per kg.

EVENTS

Swachchhta Pakhwada at Southern Regional Station, ICAR-NDRI, Bengaluru

The Swachchhta Pakhwads at Southern Regional Station was inaugurated with oath administration by Dr. K. P. Ramesha,

Head, Southern Regional Campus on December 16, 2020 by virtual mode. All the scientific and technical officers were assigned different event with a team of 3 members apart from Swachchhta activities to be conducted at individual sections and labs under the supervision of respective Incharge. The activities included on campus, off-campus (in rural areas) and online which ever best possible way to conduct activities while taking due care to prevailing COVID-19 restrictions. All the staff members were requested to spread the 'cleanliness drive' among at least 5 members by any electronic mode. A village programme 'Kisan Diwas' was organized on December 23, 2020 and 5 selective milk producers were gifted 10 l capacity SS milk cans for executing the clean milk production protocols. Apart from community level programmes and display, waste conservation utilization technology was demonstrated on December 30, 2020 and event was concluded on December 31, 2020.

World Food Day Celebration

World Food Day was celebrated on October 16, 2020 by arranging online Guest Lecture on the topic "Quality Assurance of Food Products" by Dr. G. S. Rajorhia, President, Indian Dairy Association, New Delhi.

National Milk Day Celebration

On the occasion of National Milk Day, online platform Guest Lecture on the topic "Dr. Verghese Kurien and Indian Dairy: Expectations and Achievements" by Dr. N. V. Belavadi, Former Executive Director, NDDB was organised by the Alumni Association of SRS of ICAR-NDRI in association with IDA, SZ, Bengaluru on November 26, 2020.

EASTERN CAMPUS, KALYANI

RESEARCH

Effect of North-Eastern Himalayan Forest Tree Leaves as Herbal Feed Additive on Growth Performances and Feed Conversion Efficiency of Growing Crossbred Calves

(A. Santra, S. K. Das, T. K. Dutta and M. K. Ghosh)

There has been an increased interest to use natural products containing plant secondary compounds like tree leaves instead of chemical feed additives to modify rumen fermentation for improving feed utilization and productive performance of ruminant animals. North-eastern part of India possesses wide variety of tree leaves, which are not yet tested as feed additives to improve animal productivity. Daqingshu (*Ficus hookeri*) tree leaves were collected from Shilong, Meghalaya during the month of November and sun dried grounded (2 mm size) leaf meals were used as feed additives for conducting the experiment. Twelve numbers of growing Jersey male cross-bred calves (about four months of age) were randomly divided into two equal groups (G1 and G2) and were fed individually under stall feeding on a mixed ration containing 50 % paddy straw and 50 % concentrate mixture for 140 days. Two types of iso-nitrogenous concentrate mixtures (C1 and C2) were prepared. Wheat bran

in concentrate mixture (C2) of test group (G2) was partially replaced (4 parts w/w) with *Ficus hookeri* leaf meal.

Dietary supplementation of sun dried *Ficus hookeri* leaf meal as herbal feed additive did not have any effect on voluntary feed intake. DCP content in the ration of both experimental groups was similar while TDN content of the ration was higher ($P<0.05$) in *Ficus hookeri* leaf meal fed calves (G2). Final body weight, average daily body weight gain and feed conversion efficiency were higher ($P<0.01$) for the calves supplemented with *Ficus hookeri* leaf meal as herbal feed additive (G2) than the non supplemented calves (G1). Feed conversion efficiency in terms of DM, DCP and TDN intake per kg body weight gain was also higher ($P<0.01$) for the calves supplemented with *Ficus hookeri* leaf meal as herbal feed additive (G2) than the non supplemented calves (G1). The result of the study showed that dietary supplementation with Daqingshu (*Ficus hookeri*) leaf meal as herbal feed additive improved body weight gain and feed conversion efficiency of growing crossbred calves.

Farm Side Assessment of Colostrum Quality to Prevent Failure of Transfer of Passive Immunity in Calves

(Santu Mondal, D. K. Mandal and M. K. Ghosh)

Colostrum is the only source of natural immunoglobulin (IgG) that provides passive immunity and protects calves from several pathogens, infections, diseases etc. In organized farms, colostrums fed 1/10th of body weight, whereas, in village conditions some farmers do not feed colostrums to calves. No feeding, inadequate feeding and poor quality colostrums feeding lead to failure of transfer of passive immunity (FTPI) in calves. Nearly 39 to 50% of pre-weaned calf mortality occurred due to FPTI. FPTI is also responsible for poor growth rate and chronic morbidity in calves. Estimation of IgG levels in colosturm by ELISA method is costly, time consuming, requires sophisticated machine, skill and not possible to perform by common farmers. For this reason, an alternate method of IgG estimation has been standardized using brix refractometer. Presently developed method gives quick assessment of colostrums quality by brix value. Blood serum having digital Brix value 8.5% indicates for 10 mg/ml serum IgG level, which displays adequate passive immunity in calves. Brix value of 19.2% assured optimum colostrum IgG (50mg/ml) with fat, protein, and total solid percentage were 6.10%, 13.27%, and 18.11%, respectively. Brix % was reduced from 20.45 % to 14.36 % during the transition of 1st to 3rd colostrums of Jersey crossbred cows. It was observed that colostrums having more than 19% brix value were of good quality, assured better serum IgG after colostrums feeding and could prevent FPTI conditions in calves. Thus, feeding colostrums after assessing the quality using brix method could reduce calf mortality, morbidity and enhance growth and immunity. At farm side and farmers' herd this test could be performed very easily by putting a drop of colostrums and observing the readings of brix value. It is a very quick and easy method for estimating colostral IgG. No additional skill is required to measure it; one digital / optical Brix refractometer is required only.

Extension Activities

Through the *'Dairy Vikas Kendra'* located in the adopted village Muratipur, ERS of ICAR NDRI organized regular extension activities and several extension interventions like organizing veterinary health camp, providing regular animal health check up. Artificial Insemination of cattle etc. was done in adjoining villages of Nadia district. During the period under report, a total of 43 Artificial Insemination of dairy cow was carried out. Moreover, treatment of 307 animals was carried out through the centre and 219 farmers were benefited by those interventions.

Swatchhata Abhiyan

ERS of ICAR-NDRI organized *swatcchata abhiyan* in the month of October 2020 and staff and students of the station actively

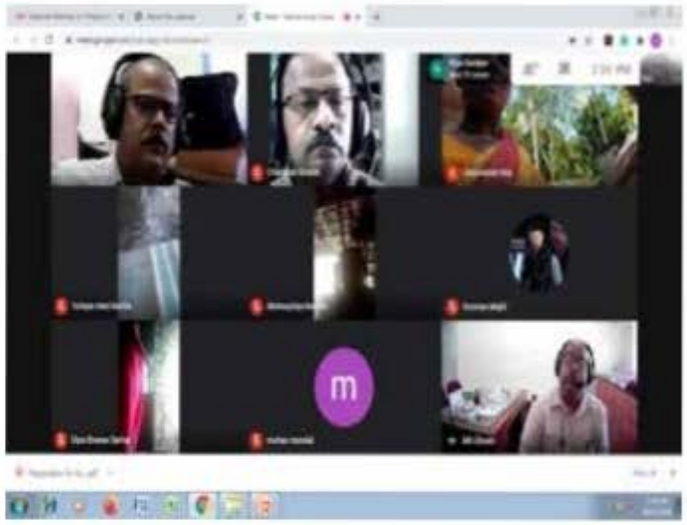
participated in the cleanliness drive of the campus. Apart from that, plantation programme was also carried out.

Live Telecast of Farmers' Interaction Programme

On 25th December 2020, a programme was arranged on Honorable PM's interaction with farmers, 150 Scheduled Caste farmers visited the campus and got firsthand knowledge about the different aspects of scientific goat farming. Live telecast of Honorable Prime Minister's programme was also shown to the farmers. At the end of the programme, guided visit of different facilities was organized for the farmers.

Webinar cum On-line Training Programme on Mahila Kisan Diwas

A webinar cum online training programme was organized during celebration of 'Mahila Kisan Diwas'. A total of 71 women farmers from 3 blocks namely Rangahat-1, Chakdah and Shantipur from Nadia district of West Bengal participated in the programme. The participants of the programme were from Nandighat, Haradham village in Ranaghat- 1 block; Sutra, Mukundanagar, Banamalipara, Ghetugachi and Rasullapur village in Chakdah block and Sahebdanga village in Shantipur



block. Apart from those participants, 11 scientists from ERS of ICAR-NDRI, Kalyani interacted with the women farmers and answered their queries.

Webinar on Present Challenges and Future Prospects of Dairy Sector in Eastern India

ERS of ICAR-National Dairy Research Institute organized a webinar on 'Present Challenges and Future Prospects of Dairy Sector in Eastern India' on October 17, 2020. Eastern and North Eastern regions of India lack good quality dairy cattle breeds, adequate veterinary care infrastructure, trained manpower and good quality feed and fodders. A significant proportion of landless laborers, small and marginal farmers of the region have access to dairying as an alternative but procurement of the fresh milk, timely chilling and processing is the most challenging element for the dairy sector. Through the webinar, the country's eminent Scientists, Researchers, Educationists, Veterinarians, Administrators, Cooperatives, Bankers, Policy makers and various government and Non-government agencies were brought to a common platform to formulate guidelines for development of dairy sector in the region. In this webinar 960 delegates registered for participation.

Dr. M. K. Ghosh, Head, ERS of ICAR-NDRI, Kalyani welcomed all dignitaries and delegates of the webinar. He put forth several

points to ponder during the webinar. Dr. M. S. Chauhan, Director, NDRI in his presidential address mentioned the importance of improvement of indigenous cattle rather than crossbred cattle and buffalo for the overall development of dairy sector in eastern and north eastern region of India. He also emphasized on the importance of value addition of milk for remunerative price which can generate livelihood of millions of farmers residing in this region.

Dr. B. N. Tripathi, Deputy Director General (Animal Sciences), ICAR was the chief guest of the programme and shared his concern for low penetration of Artificial Insemination in eastern and North Eastern India. He stressed on putting forward policy reforms in securing sustainable livelihood in the region through dairy farming.

Dr. K. M. Bujarbaruah emphasized that, technology alone cannot solve all the problems of the region but to overcome the problems in dairy sector of the region 'technology plus' approach should be taken. Suitable Policy framework, skill development of stake holders and proper support system mechanism for the dairy farmers can enhance the production and productivity of milk in eastern India.

Dr. A. K. Srivastava, Member, Agricultural Scientist Recruitment Board, New Delhi & President of NADS(I) in his keynote address, pointed out inadequate cold chain facility, poor network of milk cooperatives, old milk processing plants, lack of quality milk production system, slow diffusion of new technologies, poor linkage between farmers and research institutes are some of the major challenges of dairy sector in Eastern and North-Eastern region. He concluded that, the future of dairy sector in Eastern India can be improved by providing attention to small holder dairy farmers, breed improvement, value addition, modernization of dairy infrastructure, bridging gap of fodder as well as semen production and requirements etc.

Dr. Chanchal Guha, VC, WBUAFS, Dr. Rameshwar Singh, VC, Bihar Animal Science University, Dr. T.K. Dutta, PS; Former Head, ICAR- NDRI, ERS, Dr. Nazrul Haque, Director, ICAR- NRC on Mithun, Prof. Nilotpal Ghosh, Dean, F/O Veterinary & Animal Sciences, WBUAFS, Dr. L.K. Babu, Dean, College Of Veterinary Science & Animal Husbandry, Bhubaneshwar, Dr. Lalnuntluangi Hmar, Dean, College of Veterinary and Animal Sciences, Selesih, Aizawl, Dr. B.N. Saikia, Dean, F/O Veterinary Science, Assam Agriculture University, Dr. Dora Saha, Team Leader, NDDB, Kolkata, Dr. M.S. Kundu, Director (Extn. Edu.), RPCAU, Dr. Asitava Sur, VPO, Keventers Agro Ltd, Dr. K. P. Ramesha, PS & Head, ICAR- NDRI, SRS, Dr. S. M. Deb, PS& Head, AG&B Division, ICAR- NDRI, Karnal raised thought provoking issues during the webinar.