राडेअनुसं समाचार

NDRI News

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

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

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From the Director's Desk

India is bestowed with a remarkable wealth of zebu cows and buffaloes, placing it at the forefront of global dairy industry. India is the highest milk producing country in the world with the production of over 221 million metric tons milk (2022), contributing 23% of the global milk production. Notably, Indian buffalo yields an average of 5.8 kg milk daily, while Indigenous cows produce 4 kg. However, some exceptional animals have extraordinary milk productivity i.e. 20 to 25 kg per day. Farmers engaged in dairy husbandry prefer breeding of their female cows with the semen of superior bulls having good pedigree records. The Indian government has been operating various schemes to increase the productivity of dairy animals. Higher productivity can be achieved by expanding coverage of artificial insemination, from an existing 30% to 80-90%. It is anticipated that approximately 300 million frozen semen doses are required annually for breeding of 125.34 million milch bovine animals**.** Therefore, there is a huge requirement for quality bulls for semen production. In addition, the conventional progeny testing program needs 8 to 10 years to declare a bull to be proven. Therefore, it is technically challenging to meet the demand of semen using conventional progeny-tested bull production.

The development of animal cloning technology represents a revolutionary advancement in the field of animal production. This technique holds the potential to reshape and accelerate genetic progress within animal population, offering a number of benefits ranging from enhancing desirable traits to preserving endangered species. By creating genetically identical copies of high-performing animals using animal cloning technology, it is possible to expedite the dissemination of desirable traits throughout a population in the shortest possible ways. This approach circumvents the lengthy timeframes associated with traditional breeding methods, thus, enabling quicker genetic gains. As a result, these animal traits could lead to their enhanced milk yield, disease resistance and reproductive performance with remarkable precision.

ICAR-NDRI stands as a distinguished Institution on the global stage in the area of reproductive biotechnology. NDRI's legacy of innovation culminated in several groundbreaking research achievements. On 6th February 2009, the NDRI proudly announced the production of world's first cloned water buffalo, showcasing its leadership in cutting-edge research. ICAR-NDRI added another remarkable achievement on March 16, 2023 to its repertoire - the birth of 'GANGA',

In this issue...

India's first cloned cattle animal that belongs to the famed Gir breed. Over the period of 15 years, ICAR-NDRI has produced several clones of females having normal milk production and quality as well as breeding bulls with good fertility. The notable clones are GARIMA, KARNIKA, RAJAT, SWARN, KARN, TEJAS, SHAKTI, BASANT, and GANTANTRA. The semen of cloned bulls can be efficiently used to upgrade the population of non-descript and low-milk producing animals. For example, Rajasthan (13.7 million) and Madhya Pradesh (10.3 million) have a huge buffalo population, but artificial insemination coverage is around 15%. Also, the population of the non-descript animals is high. In such states, the semen of cloned bulls can promptly be used for genetic up-gradation. Additionally, the recent establishment of sexed semen production laboratories in the country provides the opportunity to utilize cloned bulls for sex semen production and further augmenting technological advancements.

The pioneering work of ICAR-NDRI in animal cloning not only showcases the Institute's scientific contributions but also holds profound implications for the growth of dairy husbandry. Animal cloning technologies developed by ICAR-NDRI can bring new dimensions to the country's efforts to produce quality dairy animals, and the farmers can be benefitted from the advanced reproductive biotechnologies. The contributions of the Institute through these advanced technologies will undoubtedly help the farmers to enhance the productivity of their dairy animals and to ensure sustainable milk production in the country.

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

RESEARCH

Ganga: India's First Cloned Desi Gir Female Calf Produced

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

Indigenous cattle breeds such as Gir, Sahiwal, Tharparkar and Red-Sindhi, play a pivotal role in milk production and growth of Indian dairy industry. The low productivity of Indigenous cows remained a major bottleneck in sustainable dairy production; however, considering their better adaptability under Indian conditions, these breeds need multiplication and conservation. Globally, the application of assisted reproductive technologies has been acclaimed as rapid and practically feasible for multiplication of superior germplasm. Among the several technologies, animal cloning can play a key role in faster multiplying elite animals and the conservation of endangered breeds. In this direction, in 2021, National Dairy Research Institute (NDRI), Karnal in collaboration with Uttarakhand Livestock Development Board (ULDB), Dehradun initiated the work on the cloning of indigenous cows such as Gir, Sahiwal and Red Sindhi. The application of cloning technique is quite challenging for cows because of the certain practical and operational difficulties. Under this ambitious project, a cloned Gir female calf named **'GANGA'** weighing 32kg was born on March 16, 2023 and is growing well. To clone the Gir, oocytes were isolated from Sahiwal cows using ultrasound-guided needles and then, matured for 24 hrs. under control conditions. The somatic cells of the female Gir heifer are used as donor genomes, which are fused with OPU-derived enucleated oocytes. Following chemical activation and *in-vitro* culture, the developed

blastocysts are transferred into recipient crossbred HF cows to deliver the Gir calf **'GANGA'**. Gir, a native breed of Gujarat is becoming popular among the dairy farmers because of its docile nature and goodness of milk. Gir cattle are very hardy and well known for their tolerance to conditions of stress and resistance to various tropical diseases. Outside India, Gir cattle are also very popular and have been exported to Brazil, the United States, Mexico and Venezuela for the development of zebu cows. This developed technique will bring new dimensions to our scientific efforts to produce quality indigenous dairy animals and the farmers will be benefited from this advanced reproductive biotechnology.

Production Performance of Alpine x Beetal (AB) and Saanen x Beetal (SB) Crossbred Goats

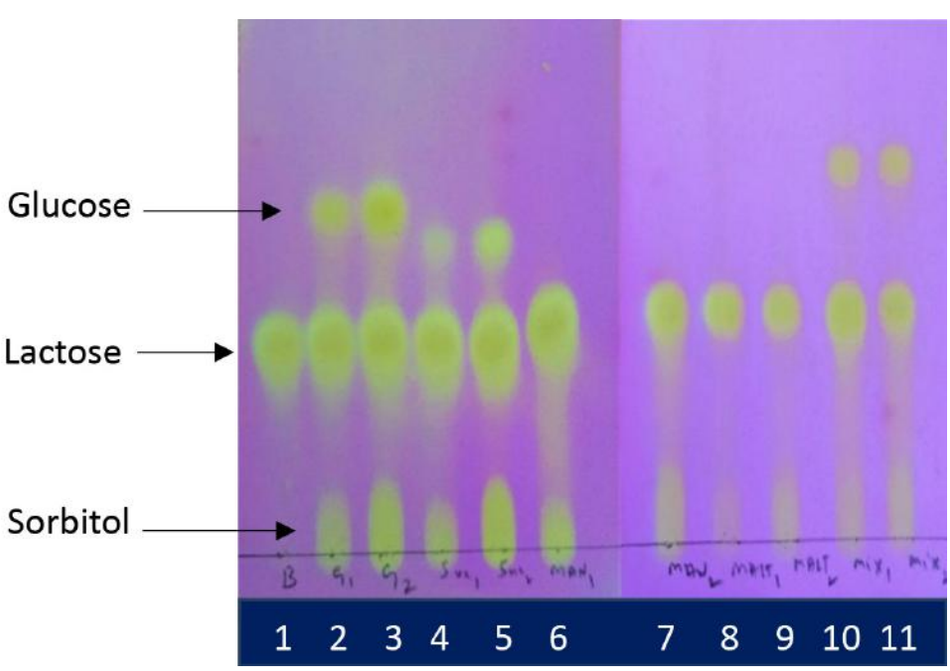
(Gopal Gowane, Rani Alex and Vikas Vohra)

The Alpine x Beetal and Saanen x Beetal goats were produced at NDRI, Karnal under the AICRP project. The flock has high genetic merit for prolificacy as they produce twins and triplets and hence, are good candidates for profitable goat farming. These goat germplasms have also proven to be India's best milk germplasm as they produce nearly twice milk as compared to any milk goat breed of India. These goats produce approximately 100 liters more milk per 150DMY on average production of any other native Indian goat breed. The average 150DMY (kg.) in various goat breeds, including Jakhrana, Marwari, Kutchi and Sirohi was reported to be 101.00, 92.65, 83.52 and 90.96, respectively. However, AB and SB goats produce nearly 200kg. These germplasms, therefore, need extensive efforts for spread as an improver breed for enhancing productivity of the local Indian goats. The estimated total milk yield (average) for AB and SB is nearly 270kg. in first lactation.

Detection of Sorbitol in Cow and Buffalo Milk

(Vivek Sharma, Priyanka Singh Rao, Sumit Arora, Richa Singh and Ranjit Kumar)

A thin layer chromatography based method for the detection of sorbitol in both cow and buffalo milk was standardized. The standardized TLC conditions, which were capable of separating the sorbitol in the aqueous system in the presence of other sugars and sugar alcohols were:- i) the use of Silica gel 60F TLC plates after Cu-impregnation for 1.5 min. ii) Sample application volume 2.0 µl. iii) Solvent system consisting of n-propanol: ethyl acetate: water (7:1:2) proportion. iv) 0.5% of potassium permanganate in 0.1M NaOH as colour developing reagent. v) Drying temperature (65°C/10 min.) after spraying the colour developing reagent. The limit of detection was 0.2% of added sorbitol in milk.



1-blank;
2 & 3-Sorbitol+Glucose;
4 & 5-Sorbitol+Sucrose;
6 & 7-Sorbitol+Mannitol;
8 & 9-Sorbitol+Maltitol and
10 & 11-All the sugars

EXTENSION

DAIRY EXTENSION DIVISION

Extension Division

Demonstration of indigenous medication for controlling sub-clinical mastitis in dairy animals

Mastitis is a costly and devastating disease in dairy animals, which substantially reduces the profit of the farmers. The average loss in milk yield has been estimated to be 2.58litres/day. NDRI assessed indigenous medication of National Innovation Foundation (NIF), DST Gujarat in farmer's field. Animals were tested for mastitis by California Mastitis Test (CMT). About 30 g of *Coccinia indica* powder was mixed with feed and served for five days for each infected animal. More than 60% animals exhibited recovery from subclinical mastitis. This herbal solution has been found effective in providing cost-effective udder healthcare. During the interaction, while motivating the farmers for the field testing of NIF's supplement, it was observed that farmers were aware of mastitis. However, fifty percent of them were reluctant to test the animals for fear of impending economic implications once the animals are found positive for mastitis. This shows the need to educate farmers through systematic extension interventions.

Hon'ble Agriculture Minister Sh. Narendra Singh Tomar addressing the farmers during Kisan Sangosthi at Sheopur (M.P.)

Exhibitions Organized

SN	Date	Place	Event	Visitors
1.	February 9, 2023	IIWBR, Karnal (Hr.)	Kisan Mela	752
2.	February 28, 2023	NDRI, Karnal (Hr.)	National Science Day	1082
3.	March 11, 2023	Gorus, Sheopur (M.P.)	Kisan Sangosthi & Pashu Mela	4568
4.	March 18-20, 2023	Pipra Khoti, Purav Champaran (Bihar)	Pashu Sarksan Udyan pardarsani & Aatam Nirbhar Krishi Mahotsav	9057
5.	March 21- 22, 2023	Tilwara Barmer (Raj.)	Pashu Mela	6783

Animal Health Camp

Animal health camps were regularly organized in Garhi Gujran, Samoura, Naglaroran and Kamalpur Roran villages of the Farmers First Project (FFP) in collaboration with the Animal Husbandry and Dairy Department of Haryana in the month of March, 2023. Infertility problems in animals were sorted out through these camps by the expert team of veterinarians. Theileriosis vaccinations were also administered to the high-yielding animals to control the disease in the crossbred animals.

Animal Health Camp organized under Farmers First Project

National Elocution Competition

The United Nations has recognized 2023 as the International Year of the Millet in response to a proposal from India. It is fascinating how millets can help the world to confront food and nutritional deficiencies. As global agri-food systems struggle to feed a rapidly growing population, robust millets based crop production system offers an economical and nutritional alternative. Considering the important role of millet in livelihood of millions of farm families, NDRI organized the National Elocution Competition on "Millets Led Global Food and Nutritional Security" on March 9, 2023. Wide participation of students representing traditional universities and farm universities was witnessed and Winners (1st, 2nd & 3rd) were awarded with certificate and prize.

Krishi Vigyan Kendra

- KVK organized Kisan Goshthi on Natural Farming in collaboration with IFFCO, Karnal on February 28, 2023 at village-Mahamadpur. Experts delivered lectures on different aspects of Natural Farming. In this program, 75 persons participated including 60 farmers.
- KVK participated in Global millet conference inaugurated by Prime Minister Narender Modi in Online mode at KVK on March 18, 2023. In this event, 85 farmers and farmwomen participated.

- KVK organized Kisan Mela on Natural Farming on March 21, 2023 at village-Kudak Jagir. Experts delivered lectures on Natural Farming. Awareness on crop residue management and minimum use of pesticides was also given. In this program, 73 farmers and others participated.

- Awareness program on 'World Women Day-2023' was organized on March 7, 2023 in Rindal village in which 65 participants took part. Lectures on topics such as women and child health, health benefit of millets and nutri-gardening were delivered.

- KVK organized field visit on Frontline Demonstration of new garlic variety G404 at village-Kunjpura on March 13, 2023. Lecture on new technology of garlic cultivation was delivered to the farmers. In this event 10 persons participated.
- Field Day on Cluster Frontline Demonstration on mustard crop was organized at village-Kaimla and Phurlak on March 16, 2023. In this event harvesting of mustard crop was done. Lecture on new latest variety Radhika of mustard crop was delivered to the farmers. In this event, 30 farmers participated.

Other Activities

Sl. No.	Activities	Village Name	No. of Participants	Date
1.	Cluster frontline demonstration on oilseed crop mustard	Bansa	18	January 4, 2023
		Kudak Jagir	18	January 12, 2023
		Chaura	15	January 18, 2023
		Kaimla	16	January 19, 2023
		Kudak Jagir	15	February 8, 2023
		Phurlak	12	March 16, 2023
		Kaimla	18	-do-
2.	Awareness programme on natural farming	Satondi	25	January 4, 2023
		Kaimala	29	February 14, 2023
		Kharajpur	20	March 13, 2023
3.	Awareness on kitchen gardening and poshak vatica	Padhana	15	January 16, 2023
		Padhana	12	January 31, 2023
4.	Awareness on global millet program	Rindal	65	March 8, 2023
		Kudak Jagir	190	March 21, 2023
	Total		**468**	

On-Campus Training

Sl. No.	Activities	No. of Participants	Date
1.	डेरी प्रसंस्करण प्रशिक्षण कार्यक्रम	14	January 10-13, 2023
		08	January 17-20, 2023
2.	वैज्ञानिक विधि से पशुपालन में प्रशिक्षण	30	January 2-6, 2023
		30	January 23-27, 2023
		30	February 6-10, 2023
		30	February 27, 2023 to March 3, 2023
		30	March 13-17, 2023
3.	वैज्ञानिक विधि से बकरी पालन में प्रशिक्षण	22	Jan. 30 to Feb. 3, 2023
4.	प्राकृतिक खेती	59	February 1-2, 2023
5.	मधुमक्खी पालन	35	March 20-23, 2023
	Total	**288**	

Frontline Demonstrations (FLDs/ OFTs)

Oilseeds and Pulses

KVK, ICAR-NDRI organized CFLDs in various villages of Karnal district to encourage farmers to grow pulse. During the summer season total 55 FLDs of Moong variety MH-1142 in 22.35 Ha areas were organized.

Exposure Visit

During the period, a total of 1534 farmers and farmwomen from different state of India visited KVK, ICAR-NDRI, Karnal under exposure visit.

EVENTS

Celebration of Academic Month of ICAR-NDRI, Karnal (Deemed University)

Academic Month of ICAR-NDRI (Deemed University) was celebrated from 3rd week of February to last week of March, 2023:

Date	Event
February 28, 2023	**Dr. N.N. Dastur Memorial Oration** by Dr. B.N. Tripathi, Deputy Director General (AS), ICAR, New Delhi.
March 2, 2023	Presentation of **Best Thesis (Master's Programme)** for 2020-21 and 2021-22. Parallel Sessions were conducted for Processing, Production and Social Science groups
March 3, 2023	Presentation of **Best Thesis (Ph.D. Programme)** for 2020-21 and 2021-22. Parallel Sessions were conducted for Processing, Production and Social Science groups
March 4, 2023	Organization of **Innovative Millet Foods Contest** for the students of colleges and universities
March 14, 2023	**Dr. K.K. Iya Memorial Oration** by Dr. M.S. Chauhan, Vice-Chancellor, GBPUA&T, Pantnagar (Uttarakhand)
March 27, 2023	**Dr. D. Sundaresan Memorial Oration** by Dr. Himanshu Pathak, Secretary DARE & Director General, Indian Council of Agricultural Research, New Delhi

National Science Day

During the celebrations of International Year of Millets-2023 and on the occasion of National Science Day, various research divisions of Institute had set-up their stalls at the Exhibition for School Students. Subject matter experts explained the importance of milk and dairy products and also the importance of millets in our diet to the visitors.

Workshop on Genome Editing in Farm Animals

A workshop on "Genome editing in farm animals for improved productivity and health" was held on March 3, 2023 at Animal Biotechnology Division. Prof. Wilfred Kues from FLI ING Germany was the key resource person to deliver the lectures during the workshop. About 200 participants attended the workshop in hybrid mode.

Workshop on Personal Brand Building and Self Management

A workshop on 'Personal Brand Building & Self-Management' was organized under the aegis of Institutional Development Plan-National Agricultural Higher Education Project at ICAR-National Dairy Research Institute, Karnal during March 18-19, 2023. A total of 38 students (B. Tech. III & IV year) participated in this workshop.

Winter School

A 21 days winter school on "Molecular Diagnosis of AMR (Anti-Microbial Resistant) pathogen causing Mastitis in cattle and buffalo" was conducted from (February 23 to March 15, 2023) to educate professionals regarding greater awareness, practical insights and a better understanding of Antimicrobial resistance. There were total 16 attendees (including 5 female participants) from 6 states of the country.

Entrepreneurs Meet

ICAR-National Dairy Research Institute, Karnal along with Micro Small & Medium Enterprise Development & Facilitation Office (MSME-DFO), Karnal organized NDRI-Entrepreneurs Meet on March 15, 2023 at ICAR-NDRI, Karnal.

The meet was attended by around 140 participants who showed interest in NDRI technologies and either wanted to become entrepreneur or expand their already established business. The meet was inaugurated by Ms. Alka Nangia Arora, Additional Secretary (DARE) & Financial Advisor (ICAR), New Delhi.

Innovative Millet Food Ideas Competition

An "Innovative Millet Food Ideas Competition" was organized under the aegis of ongoing IDP sub-project (NAHEP) on March 4, 2023 for 104 students of UG, PG and Ph.D. in hybrid mode. A total of 104 (86 in offline and 18 in online mode) students had participated in this event.

Meetings Organized

- Mid Term Review IRC Meetings were held for critical evaluation and monitoring of the progress reports of the on-going research projects in presence of invited outside subject matter experts under the Chairmanship of the Director of the Institute on October 8, 2022 at Southern Regional Station, Bengaluru and November 9, 2022; December 22 & 28, 2022; January 4, 5, 10, 2023 at NDRI, Karnal.
- 48th Extension Council Meeting was organized on February 8, 2023 at NDRI, Karnal.

Training Programmes

- Five day training on "Chemical and Microbiological testing of Milk and Milk Products to meet FSSAI requirements" from January 2-6, 2023 for officials of HP State Cooperative Milk Producers Federation Ltd., Shimla.
- Five day training on "Laboratory Assessor's Training course as per ISO/IE 17025: 2017" from January 16-20, 2023 for ICAR scientists.

PERSONALIA

Permission Granted to the following Staff for attending Workshop/ Seminar/ Symposia/ Conference/ Training during the period from January to March 2023:

Scientist's Name & Designation	Title of the Programme	Period of the Programme
Dr. M. L. Kamboj, PS	20th CVA Asian Regional Meeting and International Conference on Animal Welfare Research and Diagnosis of Canine Rabies at Bengaluru (Karnataka).	January 16-21, 2023

Dr. M. L. Kamboj, PS Dr. S. S. Lathwal, PS Dr. Mukesh Bhakat, PS Dr. Indu Devi, Scientist	National Livestock Conference and 29th Annual Convention of Indian Society for Animal Production and Management (ISAPM) at Bhubaneswar (Orissa).	January 18-20, 2023
Dr. Nishant Kumar, Sr. Scientist	23rd Indian Veterinary Congress and 30th Annual Conference at College of Veterinary Sciences, Anand (Gujarat).	February 3-4, 2023
Dr. Sohan Vir Singh, PS	National Conference at Tamil Nadu Agricultural University, Coimbatore.	February 15-17, 2023
Dr. Arun Kumar Mishra, PS Dr. Goutam Mondal, PS Dr. Nitin Tyagi, PS Dr. Sachin Kumar, Scientist Dr. Pradip Behare, Scientist	XII Biennial Conference New Horizons of Animal Nutrition Research: Combating the Challenges of Productivity, Health and Welfare of Animals at DUVASU, Mathura (UP).	February 16-18, 2023
Dr. Vikas Vohra, PS Dr. G. R. Gowane, Sr. Scientist	National Symposium at MAFSU Parbhani.	February 23-24, 2023
Dr. Sadeesh E.M., Sr. Scientist Dr. Nishant Kumar, Sr. Scientist	International Conference on Reproductive Health with Emphasis on Innovation Technology: Hope, Risk and Responsibilities at Ravenshaw University, Cuttack (Odisha).	February 24-26, 2023
Dr. G. R. Gowane, Sr. Scientist	Training programme on Genomic Selection at NDDB, Anand (Gujarat).	March 1-3, 2023
Dr. Sohan Vir Singh, PS Dr. Rajan Sharma, PS Dr. Vivek Sharma, PS Dr. Yogesh Khetra, Sr. Scientist Dr. Pradip Behare, Scientist Dr. Sachin Kumar, Scientist Dr. Kamal Gandhi, Scientist	49th Dairy Industry Conference at Gandhi Nagar (Gujarat).	March 16-18, 2023
Dr. Hardev Ram, Sr. Scientist	International Conference at Imphal.	March 17-19, 2023
Dr. P. S. Minz, Sr. Scientist Dr. Rani Alex, Sr. Scientist	Training programmes Multivariate Data Analysis (online mode).	March 20-27, 2023
Dr. G. S. Meena, Sr. Scientist	8th International Conference on Recent Advances in Agriculture Animal Husbandry, Sciences & Technology-2023 at Gwalior (MP).	March 26-28, 2023

Joining/ Promotion/ Relieving

- Dr. Bimlesh Mann, Principal Scientist & Acting Head, Dairy Chemistry Division appointed to the post of ADG (EP&HS) ICAR, New Delhi vide Council's Office Order No. 4(3)/2020/ Per-III dated January 31, 2023 and relieved from ICAR-NDRI as on February 2, 2023.
- Ms. Shakuntla Rani, Private Secretary promoted to the post of PPS at IIWBR, Karnal vide Office Order No. Admn.6-1/2022-Estt.I (Part-1) dated December 16, 2022 and February 9, 2023 and was relieved from ICAR-NDRI, Karnal as on February 9, 2023.

राजभाषा एकक

संस्थान राजभाषा कार्यान्वयन समिति की बैठक

संस्थान राजभाषा कार्यान्वयन समिति की 1 जनवरी, 2023 से 31 मार्च, 2023 तक की तिमाही समीक्षा बैठक दिनांक 31 मार्च, 2023 को अपराह्न 3.30 बजे संस्थान के डा. एन. एन. दस्तूर सभागार में आयोजित की गयी।

बैठक में दिनांक 29 दिसम्बर, 2022 को आयोजित पिछली बैठक के कार्यवृत्त पर सघन चर्चा के उपरान्त पुष्टि की गई। साथ ही बैठक की कार्यसूची पर भी विस्तार से चर्चा की गई।

हिन्दी कार्यशाला का आयोजन

संस्थान में नगर राजभाषा कार्यान्वयन समिति के तत्वावधान में दिनांक 21 फरवरी, 2023 को नराकास करनाल की 76वीं छमाही समीक्षा बैठक के कार्यसूची में आंकड़े भरने संबंधी कार्यशाला विषय पर तिमाही हिन्दी कार्यशाला का आयोजन किया गया। जिसमें 48 अधिकारियों एवं कर्मचारियों ने हिस्सा लिया।

संस्थान में नगर राजभाषा कार्यान्वयन समिति के तत्वावधान में कार्यशाला (21 फरवरी, 2023) की झलक

SOUTHERN CAMPUS, BENGALURU

Research Highlights

Portable Machine for Cutting Blocks of Frozen Untampered Butter Developed

The machine comprised of isothermal blades, process control system, pressure plate, pneumatic cylinders and movable trolley. The developed unit could cut the frozen butter block in 8 min without thawing when operated at optimized conditions, which corresponded to throughput of 187.5kg./h and 4125kg./day.

Extension Activities/Transfer of Technologies

Advisory Services

Advisory services were rendered to 33 clienteles during their personal visits to the Institute and also through phone and mail enquiries. The profile of the advisory services comprised, technical advice on scientific dairy farming, management of indigenous dairy cattle, hydroponic green fodder production, improvised cattle feed and preparation of milk and milk products.

Visitors

The visitors' profile included 280 students in 8 batches, 80 farmers in 4 batches from different parts of Karnataka and adjacent States. The visitors were taken round the Institute as per their needs and were briefed on the research and extension activities.

SCSP Project

During the period various technical inputs were distributed to beneficiary-SC farmers in the adopted villages of Kolar district, Karnataka State, under DAPSC project. Farmers were provided with various critical inputs including feed supplements viz., Concentrated feeds (20MT), improved hybrid fodder crop seeds viz., Sorghum CoFs-31 (0.5MT to enhance their animal productivity and income from livestock farming. Further, extension literature depicting monthly advisories on various aspects of improved dairy farming practices were also distributed. A total of 107 dairy farmers from Kolar district were benefited under DAPSC project. Cattle Health cum Infertility Camp was organized in collaboration with KMF officials for the benefit of SC farmers in the adopted villages, Viz., Jiganathimmanahalli and Thoralakki of Kolar district under SCSP funded IRC project on February 2, 2023.

Exhibition Participation

The Institute participated in the National Horticultural Fair 2021 on February 22-25, 2023 at ICAR-IIHR Campus, Hessaraghatta, Bengaluru. NDRI stall depicted updated technical know-how from dairy production and processing for the benefit of the farming community, with participation of farmers, entrepreneurs, research scholars and students from the state.

Outreach Activities

A Guest lecture on, 'Low cost feed formulation for dairy animals' was provided by the subject matter specialist, to 200 dairy farmers of Tumkur district of Karnataka, during the Training program organized by DAH&VS, Govt. of Karnataka on January 13, 2023.

Release of MOOCs on Commercial Dairy Farming

The MOOCs was developed under ICAR-NDRI-NAHEP project on "Incentivizing Dairy Education through

Innovative Learning Approaches". ICAR-NDRI and ICAR-NAARM partner together in developing digital content for offering MOOC on 'Commercial Dairy Farming' for the benefit of dairy farmers and entrepreneurs. The digital content was offered to the farmers/ entrepreneurs and students during February 1 to March 31, 2023.

Farmer First Project

Under Farmer FIRST Collaborative Project of IIHR-SRS-NDRI, as a part of International Women's Day and International Year of Millets Sensitization Programme on 'Milk and Millets for Health & Nutrition and Training Programme on 'Scientific Dairy Farming' was organized in Kanakapura Hobli of Ramnagara Taluk on March 8, 2023 for the benefit of 120 farm women families.

Major Personnel Changes

Dr. Bandla Srinivas took over the charge of Head (Acting) of Southern Regional Station on January 5, 2023.

Honours and Awards

- Dr. A. Kumaresan, Principal Scientist (ARGO) was awarded "National Fellow-2023" by ICAR on February, 2023 for 5 years.
- Dr. Monika Sharma received the Second Best Research Paper award by Indian Dairy Association during 49th Dairy Industry Conference (DIC) at Gandhinagar, Gujarat on March 18, 2023.
- Dr. Monika Sharma received INSO Best Researcher Award in the International Research Awards on Science, Technology and Management by the VD Good Professional Society on January 31, 2023.
- Allu, T. Jeyakumar, S. and S. S. Guraya received Young Scientist Award-2023 by Indian Society for the Study of Reproduction and Fertility-ISSRF on February 26, 2023.
- Allu, T. and Jeyakumar, S. received Best Paper Presentation Award-2023 by Indian Society of Animal Production and Management-ISAPM on February 26, 2023
- N. R. Indresh and B. Srinivas received second prize for Oral presentation in XII Biennial Animal Nutrition Association Conference, Mathura, UP on February 18, 2023.
- N. R. Indresh and B. Srinivas received XII Biennial Animal Nutrition Association Conference on New Horizons of Animal Nutrition Research: Combating the challenges of productivity, Health and Welfare of Animals at Mathura, UP on February 18, 2023.

EASTERN CAMPUS, KALYANI

Research

Nutrient Utilization and Plane of Nutrition of Black Bengal kids under Intensive Feeding

A. Santra, P. Jamadar, D.K. Mandal, M. Karunakaran and S.K. Das

Black Bengal goat is a small sized meat type animal breed whose home tract is considered to be the Sunderbans Zone of West Bengal. It is an important meat type of goat breed due to its high prolificacy, early maturity, low kidding interval as well as for its delicious meat and high quality black skin. Information regarding daily feed intake, nutrient digestibility and plane of nutrition of growing Black Bengal goats maintained under stall feeding is lacking. Twenty weaner Black Bengal Kids were divided in to four groups (G1, G2, G3 and G4) and fed individually under stall feeding on four types of complete mixed ration which contained various levels of energy and protein e.g., Diet-1: High energy and high protein, Diet-2: High energy low protein, Diet-3: Low energy high protein and Diet-4: Low energy low protein.

The diets fed to the kids in G1 and G3 groups contained higher amount of dietary CP e.g., 13.6 and 13.5%, respectively than the diets to the kids in G2 (10.3%) and G4 (10.2%) groups. Digestibility of NDF, ADF and cellulose were significantly higher in G4 followed by G3, G2 and G1 groups. Digestibility of fiber fractions was higher in G4 and G3 due to the higher level of roughage in their diets. The nutritive value of the ration is significantly influenced by varying levels of energy and protein content in the diets of kids. DCP% in G1, G2, G3 and G4 groups were 8.9, 6.5, 8.6 and 6.3%, respectively. It was concluded from the study that energy and protein level in the diet influence the nutrient intake, its digestibility and plane of nutrition in goats. Daily dry mater intake, digestibility of DM and OM, TDN content of ration as well as TDN intake per unit of body weight were higher (P<0.01) in goats maintained on high energy diets.

Exogenous Kisspeptin: Potent Regulator of Libido and Sexual Behaviour in Black Bengal Buck

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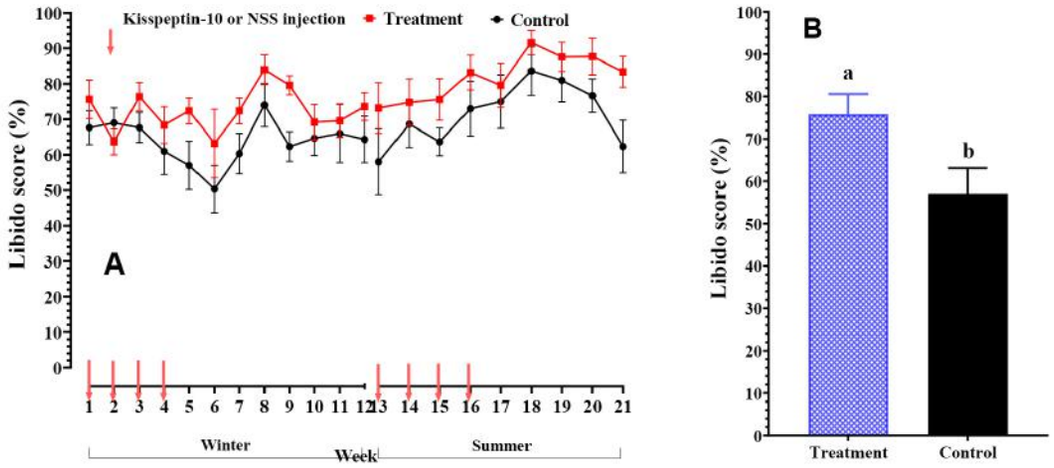
Studies were undertaken to explore the effect of exogenous kisspeptin on sexual behaviour in Black Bengal buck. For the purpose, a total of 12 adult breeding Black Bengal buck selected were divided into treatment group (n=6), treated with KP-10 @ 2.5µg/kg. body weight through intravenous route and control group (n=6) administered with equal volume of NSS for four consecutive weeks during winter and summer seasons to determine the seasonal variation in libido and sexual behaviour elicited by exogenous KP-10, if any, during semen collection through artificial vagina. Our study revealed that exogenous KP-10 lowered (p<0.05) the reaction time in treatment group (31.35±3.88 sec) comparing with control group (36.12±5.08 sec).

The sexual aggression, tactile stimulation, libido, mating ability and sexual behaviour scores were higher (p<0.05) in the treatment group than control animals during both the seasons, respectively. Conversely, KP-10 injection significantly increased (p<0.05) plasma testosterone concentrations (5.88±0.45 ng/ml in treatment group vs. 3.91±0.67 ng/ml in control group)

in the treated animals during both the seasons. These results clearly indicate that exogenous kisspeptin enhances libido and sexual behaviour in Bengal bucks.



Effect of exogenous KP-10 on libido score during treatment, post-treatment period in winter and summer season (A) and entire experimental period (B) in Black Bengal buck.

Extension Activities

Health Camp for Livestock Development Programme under TSP project

ICAR-NDRI, ERS, Kalyani, West Bengal organized one day programme on Livelihood Improvement of tribal Farmers through Health camp for livestock development programme at A-5 tribal area, Kalyani, Nadia (WB) on January 24, 2023 under NDRI-TSP Project Component. Few intern B.V.Sc. & A.H. students also actively participated the health camp in full spirit. A Scientists-Farmers' Interaction session was conducted as well. A total of 83 tribal farmers benefited through this health camp for rearing their animals. In the camp total 269 goat, 45 kids and 9 pigs were vaccinated to help tribal farmers to rear goat, pig scientifically and it is expected for higher economic gain by the practicing and resource poor farmers.

Input Distribution Programme at ERS, NDRI under TSP project

ICAR-NDRI, ERS, Kalyani, West Bengal organized one day programme on Livelihood Improvement of tribal farmers through Livestock Interventions at ERS campus, Kalyani,West Bengal on March 14, 2023 under NDRI-TSP Project Component. A Scientists-Farmers' Interaction-cum-Training programme was conducted followed by livestock input distribution among beneficiary tribal farmers participated in the programme. Some inputs were distributed to 30 farmers (chicks, poultry feed, poultry feeders, mineral mixture and supplements) as a component of direct benefits transfer under the TSP project. All these inputs were distributed to beneficiary farmers to help them rear poultry birds scientifically and for higher economic gain.

Organization of Training Programme on Scientific Animal Husbandry under SCSP

One training programme titled "Scientific Animal Husbandry for Scheduled Caste Unemployed Youth" was organized from March 14-16, 2023 by the ERS of ICAR-NDRI under Scheduled Caste Sub-Plan Project. A total of 31 participants took part in the training programme. Out of the 31 trainees, 15 were women and 16 were men. The trainee farmers were from Nadia district of West Bengal state. Participants of the training programme gained knowledge on a variety of topics related to scientific animal husbandry, such as housing management, health management and scientific animal feeding. The training programme would help scheduled caste farmers to rear livestock in a scientifically sound manner and enhance their financial status.

Livestock Development Programme at Namsai, Arunachal Pradesh under NEH Project

ICAR-National Dairy Research Institute, Eastern Regional Station, Kalyani, Nadia, West Bengal organized a programme on "Livelihood Improvement NEH Farmers through Livestock Interventions" through Scientist-farmer's interaction meet-cum- training programme of tribal farmers, Input distribution activities and awareness programme on March 21-22, 2023 at the KVK Namsai, Arunachal Pradesh. The programme was organized in collaboration with KVK, Namsai, Arunachal Pradesh.

Different animal husbandry inputs *viz*. chicks (2250 Nos.), ducklings (1500 Nos.), poultry feed (3750kg.), pig feed (4000kg.), feeder (100 Nos.), waterer (100 Nos.), anthelmintic powder and mineral mixture were distributed among 115 farmers. A total of 45 farmers received chicks (50 each), 30 farmers got ducklings (50 each), 75 farmers received poultry feed (50kg. each), 40 farmers got pig feed (50kg. each). In this programme 115 farmers were the direct beneficiary of livestock inputs. All these inputs were distributed to beneficiary farmers of Namsai district of Arunachal Pradesh to help them to rear poultry birds/ duckling and pigs more scientifically.

Livestock Development Programme at Morigaon district, Assam under NEH Project

One Scientist-farmer's interaction meet-cum-training/ awareness programme, input distribution activities was organized on March 21-22, 2023 at the Morigaon district, Assam. Different animal husbandry inputs viz. chicks (4480 Nos.), poultry starter feed (4000kg.), Goats (46 No.), Goat feed (5750kg.), Pigs (20 No.), pig feed (4850kg.), Feeder (144 No.), Drinker with stand (160 No.), packs of supplement, medicines and dewormers were distributed among the farmers. A total of 80 farmers received chicks (56 each), 46 farmers received goats (1 each), 20 farmers got pigs (1 each), 80 farmers received poultry feed (50kg. each), 20 farmers got pig feed (242.5kg. each) and 69 farmers got goat feed (around 85kg. each). The farmers also received other inputs like feeder, drinker and pack of dewormer/ medicines/ supplements. Around 170 farmers attended the Scientist Farmer interaction cum training/ awareness programme. All these inputs were distributed to the resource poor beneficiary farmers of Morigaon district of Assam to help them rear poultry birds, goats and pigs more scientifically and efficiently for their social, nutritional and economic security.

Training Programme on Scientific Animal Husbandry under TSP

One training programme entitled 'Scientific Animal Husbandry for Tribal Unemployed Youth' was organized during January 31, 2023 to February 2, 2023. In the training programme, a total of 35 trainees participated. Out of the 35 participants, 32 participants were female and 3 participants were male. The trainee farmers were from the Birbhum, Nadia and Jhargram districts of West Bengal state. Another training programme was organized by the ERS of ICAR-NDRI under Tribal Sub-Plan Project from February 7-9, 2023. Thirty-five participants

took part in the training programme. Out of the 35 trainees, 32 were women and 3 were men. The tribal trainee farmers were from Birbhum and Nadia district of West Bengal state. The tribal trainees learned about various facets of scientific animal husbandry, such as managing housing, managing health and scientifically feeding cattle. The training programme would improve the trainee tribal farmers' ability to raise cattle in a scientific manner and improve their financial situation.

Exposure Visit for Tribal Farmers

One exposure visit for the tribal farmers from Birbhum district was organized on February 21, 2023 by ERS of ICAR-NDRI. In the exposure visit, a total of 56 participants participated. The farmers were exposed to various aspects of scientific animal husbandry practices including scientific feeding, animal health care, fodder production, housing system etc. Fodder seeds and cuttings were also distributed among the farmers. Farmers were also exposed to various bio-fortified crop verities, which may enhance the nutritional security of the farming households. One scientists-farmers interaction session was also organized during the programme.

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