



NDRI News

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From the Director's Desk

In this issue...

FROM THE DIRECTOR'S DESK	1
RESEARCH	2
ITMC	3
EXTENSION	3
EVENTS	4
HONOURS/AWARDS	6
VISITS ABROAD	7
DISTINGUISHED VISITORS	7
PERSONALIA	7
राजभाषा एकक	8
SOUTHERN CAMPUS, BENGALURU	8
EASTERN CAMPUS, KALYANI	11

Milk today is the second largest agricultural commodity produced in our country next only to rice. India continues to dominate world dairying with record milk production of 165.4 million tonnes during 2016-17 and concomitant per-capita milk availability of 355 g. While these figures are impressive by all means, the increasing human population coupled with shrinking resources particularly cultivable land and water and

rising input costs required for farm operations make it all the more necessary that we continue to strive for obtaining more milk per animal. Optimum fertility is one of the major factors affecting the lifetime production of dairy bovine. Dairy animal reproduction is influenced by several factors including genetic, nutritional, hormonal, physiopathological and management practices. Maximizing reproductive efficiency requires perfect matching of genotypes to the production environment, together with appropriate husbandry practices, in order to ensure that the intervals from calving to conception are short and the conception rates are high.

Over the past few decades, intense genetic selection has increased milk yield per cow. However, selection has also changed reproductive physiology of the cow and led to decrease in reproductive efficiency. There is a long history of associating greater milk production with reduced reproductive performance in dairy cattle. For instance, research done on high yielding cows clearly establish that the percentage of estrus animals that stand to be mounted has declined from 80% to 50% and the duration of detected estrus has reduced from 15 h to 5 h and the first service conception rate reduced from 70% to 50% over the past 50 years. Although a majority of these studies were conducted on high yielding dairy animals, the data on moderate producing animals in our country is also indicating sub-optimal reproduction in dairy animals. Delayed age at sexual maturity, repeat breeding, anestrus, uterine infection, extended calving to conception interval and sub-optimal calving interval are the



major problems limiting the reproduction success of dairy animals in our country. These problems are particularly affecting resource poor small farmers who are unable to adopt technology intensive management practices and thereby remain unable to harness full milk production potential of the existing animals. On a conservative estimate, the country is losing 20-30 million tonnes of milk annually on account of anestrus and repeat breeding in cattle and buffaloes which translates to an annual loss of nearly Rs. 40,000-50,000 crores. Further, the population of "breedable" but "not-calved" animals accounts for approximately 10 percent of the total breedable population leading to a huge economic loss.

Optimum fertility or reproductive efficiency in dairy animals can be achieved by giving due consideration to traits associated with reproduction while selecting the animals for high milk production. However, this process will take longer time and the results could be visible only after long-term efforts. On the other hand, however, the reproductive efficiency of existing dairy animal population can be improved by using potential reproductive technologies like semen from high fertility sires, controlled breeding, post-insemination fertility enhancement treatments and assisted reproductive technologies. To improve the reproductive efficiency, programmed breeding techniques along with improved nutrition and management could be the alternative but these require huge investment in technology before its benefits could be delivered to smallholder farmers. It is noteworthy to mention that ensuring proper body condition and nutritional status is essential to



Dr. Joykrushna Jena, DDG (AS), ICAR, New Delhi visiting Artificial Breeding Research Centre at NDRI, Karnal

get desired results with the application of reproductive technologies under field conditions. Development of a comprehensive “transition cow management protocol” and its application under field conditions is expected to mitigate post-partum reproductive problems besides improving the milk production. A thorough understanding of hypothalamus-pituitary-gonadal axis in relation to milk production would help us to strategize the reproduction management in high yielding dairy animals, in future.

Recent developments in reproductive bio-techniques have opened up new avenues for manipulating the reproductive process both *in vitro* and *in vivo* in dairy animals for improving their reproductive efficiency. The impact of reproduction biotechnologies on multiplication of elite germplasm and improvement in reproductive

efficiency of dairy animals are very much evident in developed countries. However, the outreach of these technologies is limited in our country owing to several reasons including the infrastructure requirement, high cost associated with some of the technologies, inadequate expertise and limited accessibility of these techniques to the stakeholders. Nevertheless, the time has come to realize the full potential of reproduction technologies for their successful application to improve the reproduction efficiency of dairy animals and to multiply superior germplasm that is in great demand nowadays.

(R. R. B. Singh)

Improving Protein Yield in Milk of Crossbred (Karan Fries) Cattle through Marker Assisted Selection Strategy

(Aneet Kour and A. K. Chakravarty)

Kappa-casein (CSN3) in milk constitutes approximately 15% of the total casein. The study was carried out to develop Marker Assisted Selection strategy for selecting young Karan Fries (HF crossbred) animals for improving kappa-casein yield in the milk. DNA was isolated from the blood samples of 78 pedigreed Karan Fries (KF) animals. A 633 bp exon 4 region of kappa casein was amplified by PCR. DNA sequencing revealed eight SNPs- C296A, C380T, C383T,

G394T, C419A, G480A, A488T and G529T in the targeted region. It was found that SNP G480A was found in all of the heterozygous individuals (Fig.1 and Fig.2) and may be considered as an important SNP. Using regression analysis, it was found that SNP (G480A) contributed an increase of 7.5 g in κ-casein yield, which was around 11.79 % of κ-casein yield (63.62g) in average test day milk. Based on the above findings, a marker assisted selection strategy was proposed (Fig.3) for selection of young Karan Fries male and female animals for higher κ-casein yield in milk. The above strategy could be useful for obtaining higher protein yield to mitigate the problem of protein energy malnutrition in growing children.

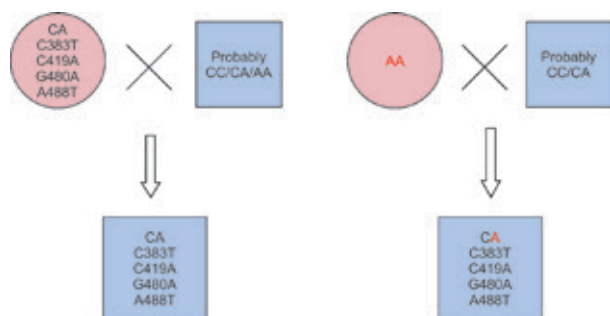


Fig. 1 Inheritance of SNPs of CSN3 gene under Daughter Dam Design (Male families)

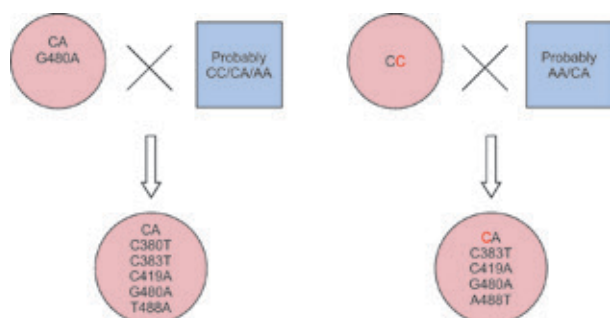


Fig. 1 Inheritance of SNPs of CSN3 gene under Daughter Dam Design (Female families)

Proposed: Marker Assisted Selection Strategy

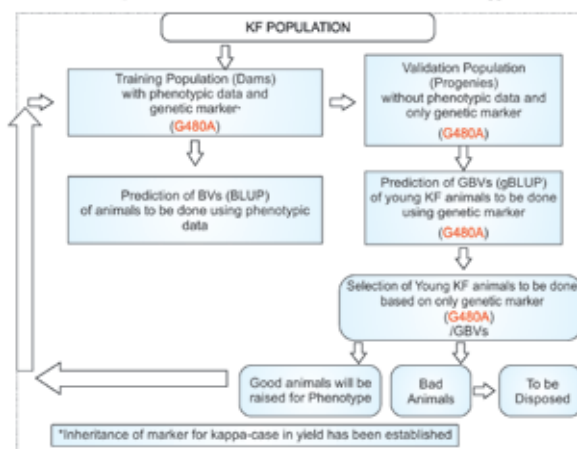
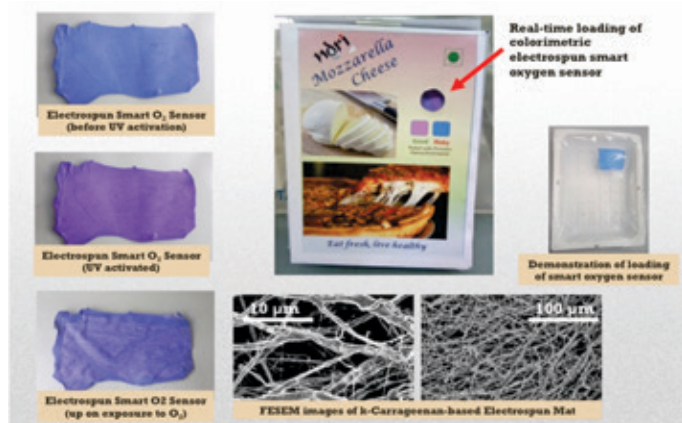


Figure 3. Proposed marker assisted selection strategy for improving kappa-casein yield in milk

Electrospun On-Package UV-activated Smart Oxygen Leak Indicator for Modified Atmosphere Packaged Dairy Products

(Shivam Panwar, Narender Raju Panjagari, A. K. Singh and P. S. Minz)

The demand for modified atmosphere packaged (MAP) dairy products is growing rapidly among consumers. The success of MAP depends on package integrity. Ingress of oxygen due to loss of



Electrospun Smart O₂ Sensor Label

package integrity is responsible for the quality loss of the products. Available colorimetric oxygen sensors are made up of synthetic polymers and contain several additives that may migrate into food upon contact with the latter. Hence, an attempt was made to develop a UV-activated smart oxygen leak indicator using biopolymers. Further, to improve the gas sensing ability, electrospinning technique

was adopted for the fabrication of oxygen sensor. Parameters of electrospinning such as voltage, flow rate and distance between collector plate and spinneret were optimized based on the colour difference value between original, photoactivated and recovered spun mats. Rheological behaviour of electrospinning solution were studied at 25°C, 35°C and 45°C and it was found that electrospinning polymeric solutions showed pseudoplastic behaviour. Microstructure of electrospun oxygen leak indicator was studied using FE-SEM, which revealed compact non-woven fibers with an average fiber size of 1-2 microns. The instrumental colour values of original and photo-activated electrospun oxygen leak indicator were studied. It was found that they were significantly different ($P>0.05$). Oxygen sensitivity of electrospun oxygen leak indicator was studied at different oxygen concentrations. The electrospun smart oxygen leak indicator (mat) was sensitive enough to detect as low as 0.1% oxygen in the packaged food. Storage stability of the developed electrospun oxygen leak indicator was also studied at different atmospheric conditions of temperature, humidity and light. The results indicated that maximum stability of the electrospun mats was observed when they were stored at refrigeration temperature, under darkness and at about 65% RH. The developed electrospun oxygen sensor can be easily integrated with packaging material and was found to be sensitive enough to detect below 0.5% oxygen in the packaged food.

INSTITUTE TECHNOLOGY MANAGEMENT COMMITTEE (ITMC)

Patent Filed

S. No.	Title of Patent	Inventors	Application Number
1.	A crosslinked membrane with flow-line capable of arresting free-flowing gold nano particles and the process for the same (Filing Date – 13/10/2017)	Y. S. Rajput, D. K. Nanda and Rajan Sharma	201711036404



Exchange of MOU for the transfer of technology of detection of buffalo milk in cow milk using Hansa test serum

Technologies Transferred

S. No.	Name of Technology	Inventors	Date of MoU	Amount in lakhs	Name of the Firm
1.	Strip based test for detection of maltodextrin in milk	Rajan Sharma, Y. S. Rajput, and Bimlesh Mann (Dairy Chemistry)	14.11.2017	1.50 + 18% GST	The Punjab State Cooperative Milk Producers' Federation Ltd. SCO 153-155, Sector 34 A, Chandigarh-160022
2.	Detection of buffalo milk in cow milk using hansa test serum	Dr. Archana Verma (Animal Genetics & Breeding)	26.12.2017	4.00 + GST (18.00%)	Mother Dairy Fruit & Vegetable Pvt. Ltd. Patparganj, Delhi-110092

Dairy Education at Farmers' Door

Dairy Extension Division organized the ongoing Extension Education Programme "Dairy Education at Farmers' Door" to strengthen the effective dissemination of dairy production and processing technologies among farming community. A team of NDRI subject matter specialists from production, processing and management group visited a new cluster of villages viz. Subri, Dadupur and Shahpur in Karnal district on 2nd Saturday of every Month. The key points of interactions were related to management of reproductive

EXTENSION



disorders of dairy animals; care of newly born calves; management of silent heat in animals; management of berseem and oats crop and clean milk production for the benefit of farming community.

Kisan Sangosthies

A total number of 10 Kisan Sangosthies were organized at village level and the issues related to management of silent heat; care and

management of calves; clean India campaign; control measure of mastitis in dairy animals; role of mineral mixture in animal diet and clean milk production practices in rural areas were discussed. The team of extension scientists gave solutions to the problems related to these issues faced by the farmers.

Empowerment of Women and Mainstreaming of Gender Issues

Three women empowerment trainings and campaigns were organized with the objective to create awareness in the field of dairying and home science and also to impart skills in these areas so that farm women could generate more income from dairying to cater to the needs of their families. By these programmes, 63 farm women were trained in villages from Ismalia, Baliana, Sahadpura and Nagla Jattan.

Educational Visits and Tours

A total number of 2116 visitors (students & Faculty) of 54 colleges/ Institutions/Universities visited the Institute. The groups were sensitized about different research, teaching and extension achievements and facilities available in the Institute.

Farmers' Farm School

NDRI has started 4th Batch of Farmers' Farm School (FFS) for marginal and land less farmers since 30th August, 2017 with the aim to enhance the productivity of agricultural practices in this series. A total number of 20 farmers were enrolled. One day exposure visit & tour was organized at the Institute. Regular classes were continuously organized on every Friday and Saturday for educating the farmers in dairy farming and its allied activities in village Deepo.

Training Programme on Microbiological and Chemical Analysis of Milk and Milk Products

Dairy Microbiology Division and Dairy Chemistry Division of the Institute jointly organised a training programme on "Microbiological and Chemical Analysis of Milk and Milk Products" from 9th – 13th October, 2017 at National Referral Centre for Milk Quality and Safety (NRCMQS) NDRI, Karnal. The training was organised for 12 participants from Commissioner of Food Safety, Thiruvananthapuram, Kerala and Umang Dairies Ltd., Gajraula, UP on the conventional ISO standard protocol for the evaluation of quality and safety of milk and milk products.

Training Programme on Milk Processing and Value Addition

Dairy Technology Division and Business Planing and Development (BPD) Unit organized a training programme on "Milk Processing and Value Addition" during 25th October - 3rd November, 2017 at NDRI, Karnal for 24 prospective entrepreneurs.

Training Programme on Sensory Evaluation of Milk and Milk Products

Dairy Technology Division conducted a training programme on "Sensory Evaluation of Milk and Milk Products" from 15th -17th November, 2017. The training was designed and organized for updating the knowledge and practices of sensory evaluation for the employees of MILKFED, Punjab. The training was attended by 19 Deputy Managers from the different milk plants of MILKFED.



Certificates being given to participants

Antimicrobial Awareness Programme

Dairy Microbiology Division organised an "Antimicrobial Resistance (AMR) Awareness Programme" on 18th November, 2017. The programme was chaired by Dr. R. R. B. Singh, Director, NDRI, Karnal. On this occasion, Dr. Rama Chaudhary, Professor, Dept. of Microbiology, AIIMS, New Delhi was the Chief Guest. The programme was attended by Dr. V. K. Batish, Secretary, PAI India and Dr. Deepak Bamola, AIIMS. Faculty members and M.Tech students and Ph.D scholars from different disciplines of the Institute also expressed their views on control measures on AMR in Dairy and Livestock sector and antibiotic resistance mechanism in bacteria.

Blood Donation Camp

Blood donation camp was organized under a banner "Model Dairy Plant and Smiling Waves" by B. Tech. (DT) students of the Institute at Bramputra, Hostel, NDRI, Karnal on 31st October, 2017.



Dr. R. R. B. Singh, Director, NDRI with the students donating blood during the camp

Training Programme on Advances in Validation of Functional Foods

A CAFT programme on "Advances in Validation of Functional Foods" was organized by Animal Biochemistry Division, NDRI, Karnal from 1st - 21st December, 2017. A total number of 21 candidates belonging to various disciplines of Animal Science and its allied fields from Agricultural Universities and other ICAR Institutes representing nine states across the country participated in this training programme.

National Dairy Mela

A three day National Dairy Mela was organised at NDRI from 23rd to 25th November, 2017 to showcase various technologies developed at NDRI and at other sister institutes located at Karnal. The mela attracted more than 10000 visitors from different states like Uttar Pradesh, Haryana, Punjab, Delhi and Rajasthan. The Mela was inaugurated by Shri Chhabilendra Roul, Additional Secretary (DARE) and Secretary (ICAR) in presence of Dr. R. R. B. Singh, Director, NDRI, Dr. Bimlesh Mann, Joint Director (Research) & Chairperson of National Dairy Mela, Dr. K. S. Kadian, Head, Dairy Extension Division & Mela Coordinator and other dignitaries. In his inaugural speech, he highlighted the need for bridging the gap between Research Institutes and farmers. He also appreciated the efforts of NDRI in hosting competitions and giving recognition to the farmer's efforts. During the inaugural function, "Dairy Mela Smarika" was released for the dairy farming community highlighting the important component of dairy farming.

The 100 stalls were a visual treat for the diverse visitors comprising students, farmers, academicians, researchers as well as entrepreneurs. All the stalls were well equipped to cater to the information needs of the visitors. A total number of 180 animals from different parts of Haryana (Sonapat, Panipat, Karnal, Kaithal, Yamunanagar, Ambala etc.) participated in various competitions under different categories such as beauty contest for heifers of indigenous cattle, dry and milch animals (Adults) and milking competitions for various breeds of cattle and buffaloes. Highlighting the need for giving women their due place in value addition and dairy development, competitions were held for women in paneer making and milking on the last day of the Mela. The competition was open to all women and 31 women participated in paneer making and 28 in milking competition, respectively. Cash prizes and mementos were given to the winners under different categories. The HF cross with a milk yield of 49.156 litre belonging to Dhalbir Singh from Ambala was declared as the highest milk yielder in all categories and buffalo breed of Narendra Singh from Panipat was honored with the title "Best Animal of the show". Prizes were also given to the best stalls among different categories.



Inaugural view of Dairy Mela



Sh. Chhabilendra Roul, Additional Secretary (DARE) and Secretary (ICAR) interacting with a cattle owner



An overall view of Dairy Mela

Training Programme on Skill and Personality Development

Animal Physiology Division, NDRI organized a training programme on "Skill and Personality Development in an Organization" from 11th - 13th December 2017. The training was attended by 22 supporting staff of the Institute. The lectures on various aspects and practical hands-on-training on data collection, experiment management, dispatch of official papers, laboratory equipment knowledge and their maintenance were delivered to the trainees.

National Milk Day Celebrated

NDRI celebrated National Milk Day by launching two health dairy drinks from its Milk Parlour on 26th November, 2017. Speaking on this occasion, Dr. R. R. B Singh, Director, NDRI said that National Milk Day is celebrated every year across the country to commemorate the birth anniversary of Dr. Verghese Kurien, Father of White Revolution in India. He informed that

India is enjoying No. 1 Position in milk production in world since 1998 due to his sincere contributions. He further said, India is producing 19% of world's milk and per capita milk availability of milk in India is presently 355 g which is above that of world average (300 g). He said that to promote milk consumption in children, NDRI is launching two health drinks in chocolate and raspberry flavour at NDRI milk parlour. On this occasion, a mini marathon was also organized wherein students, scientists and other staff participated.

Agricultural Education Day

NDRI Celebrated Agricultural Education Day on 3rd December, 2017. It was presided over by Dr. R. R. B. Singh, Director, NDRI, Karnal. On this occasion, he addressed faculty and students of the Institute. He motivated students to achieve excellence not only in academics but also in extra curricular activities.



Health drink being launched at NDRI Milk Parlour by Dr. R. R. B. Singh, Director, NDRI on the occasion of Agricultural Education Day



Dr. R. R. B. Singh, Director, NDRI launching two health drinks in chocolate and raspberry flavour at NDRI milk parlour and a mini marathon being organized wherein students, scientists and other staff participated

MOST DOWNLOADED PAPER

Research paper "**Valproic Acid Increases Histone Acetylation and Alters Gene Expression in the Donor Cells But Does Not Improve the *In Vitro* Developmental Competence of Buffalo (*Bubalus bubalis*) Embryos Produced by Hand-Made Cloning**" by Selokar Naresh L., Saini Monika, Agrawal Himanshu, Palta Prabhat, Chauhan Manmohan, Singh Manik Radheysham and Singla Suresh Kumar, Animal Biotechnology Centre, NDRI, Karnal published in *Cellular Reprogramming*, Vol.19 No. 1 (February, 2017 Issue) was the 8th most downloaded paper in the last 12 months.

AWARDS

- **Dr. Rajan Sharma, Dr. Y. S. Rajput and Dr. Bimlesh Mann** received "**Low Cost Technology Development Award –2016**" from Association of Food Scientist & Technologies (India), Mysore for Paper strip based tests for detection of adulteration in milk at ICFoST 2017, held from 7th - 9th December 2017 at Hyderabad.
- **Dr. Latha Sabikhi**, Head, Dairy Technology Division bagged "**First Prize**" in the Hindi Paragraph and Shrutlekhan Pratiyogita

and **Mrs. Prem Mehta**, Pvt. Secy., Dairy Technology Division bagged "**First Prize**" in the Hindi Muhavara/Lokokti Lekhan Pratiyogita organized by the Karnal Town Official Language Implementation Committee on 1st December, 2017.

- **Ms. Aneet Kour, Dr. A. K. Chakravarty, Mr. Varinder Raina, Ms. Poonam Ratwan and Mr. Arun Pratap Singh** got "**Best Poster Award**" for their paper presented at International conference on "Recent Trends in Bioinformatics and Biotechnology for Sustainable Development" held at SKUAST, Jammu from 12th -13th October, 2017.

- **Mr. Navan Sampath Kumar, Mr. Suvartan Ranvir, Ms. Sulaxana, Ms. Ankita Hooda and Mr. Shridhar Sameta** students (Master and Ph.D.) of Dairy Chemistry Division received **"3rd Prize"** in Nutrischolar Awards 2017 organized by DuPont, New Delhi (**Mentor: Dr. Bimlesh Mann**).



Director NDRI with students received DuPont Nutrischolar Awards - 2017

- **Ms. Ankita Hooda, Dr. Bimlesh Mann and Dr. Rajan Sharma** received **"Best Poster Award"** for the poster presented in the 26th Indian Convention of Food Scientists and Technologists (ICFoST 2017) held from 7th - 9th December, 2017 at Hyderabad organised by Association of Food Scientist & Technologies (India), Mysore.
- **Mr. Shivam Panwar**, M.Tech., 2nd year student of Dairy Technology Division bagged **"2nd Best Poster Award"** for the poster presented at International Symposium for Packaging Industry (ISPI) Research Conclave organized by Indian Institute of Packaging, Mumbai at Hotel Eros, Nehru Place, New Delhi during 27th - 28th October 2017.

DISTINGUISHED VISITORS

04.10.2017 Sh. Surendra Nath Tripathi, IAS Additional Secretary, DARE & Financial Advisor, ICAR.



11-13.10.2017 Prof. Richard Ipsen and Prof. Lilia Aehne from University of Copenhagen, Denmark.



11.12.2017 Dr. Joykrushna Jena, Deputy Director General (AS), ICAR, Krishi Bhawan, New Delhi.

VISITS ABROAD

- **Dr. T. K. Datta**, Principal Scientist, Animal Biotechnology Centre was deputed to attend International Buffalo Symposium on **"Enhancing Buffalo Production for Food and Economy"** and to deliver the key note lecture "Understanding the fertilizing ability of buffalo oocytes and spermatozoa in functional genomics perspective" from 15th - 18th November, 2017 at Agricultural Forestry University, Chitwan, Nepal.
- **Dr. Yogesh Khetra**, Scientist, Dairy Technology Division visited the University of Copenhagen, Denmark as a Guest Researcher during 13th September to 11th October, 2017 under an approved collaborative research project between University of Copenhagen Denmark and NDRI, Karnal entitled **"Understanding Enzymatic Activity in Concentrated Milk System"**.

PERSONALIA

Joining/Appointments

- Ms. Gunjan Bhandari, Scientist (Agril. Economics) joined at ICAR-NDRI, Karnal after having been relieved from ICAR-NAARM, Hyderabad w.e.f. 16.10.2017.
- Dr. S. M. Deb, Principal Scientist (AG&B) joined at ICAR-NDRI, Karnal after having been relieved from ICAR-NRC on Yak, Dirang (AP) w.e.f. 11.12.2017
- Sh. H. R. Arya joined as Sr. Admn. Officer at ICAR-NDRI, Karnal after having been relieved from ICAR-NBAGR, Karnal w.e.f. 27.12.2017.
- Sh. S. C. Sharma joined as Sr. Finance & Accounts Officer at ICAR-NDRI, Karnal after having been relieved from ICAR-CSWRI, Avikanagar w.e.f. 28.12.2017.

Promotions

- Dr. M. Sivaram, Sr. Scientist (Agril. Statistics), Southern Campus, Bengaluru promoted as Principal Scientist w.e.f. 1.8.2016.
- Dr. Rakesh Kumar, Sr. Scientist (Agronomy) promoted as Principal Scientist w.e.f. 25.6.2016.
- Dr. Hans Ram Meena, Sr. Scientist (Vety. Extn. Edu.) promoted as Principal Scientist w.e.f. 22.7.2016.
- Dr. Pradyuman Barnwal, Sr. Scientist (ASPE) promoted as Principal Scientist w.e.f. 11.9.2016.
- Dr. Menon Rekha Ravindra, Sr. Scientist (ASPE), Southern Campus, Bengaluru promoted as Principal Scientist w.e.f. 22.2.2017.
- Dr. M. C. Arunmozhi Devi, Sr. Scientist (Agril. Extn.), Southern Campus, Bengaluru promoted as Principal Scientist w.e.f. 1.1.2011.
- Dr. Satish Kumar, Sr. Scientist (Bio-Technology) promoted as Principal Scientist w.e.f. 24.7.2016.
- Dr. Rakesh Kumar, Sr. Scientist (Bio-Technology) promoted as Principal Scientist w.e.f. 22.11.2016.
- Dr. M. Karunakaran, Sr. Scientist (Animal Reproduction & Gyne.) Southern Campus, Bengaluru promoted as Principal Scientist w.e.f. 8.8.2016.
- Dr. Sadeesh E. M. Scientist (Biochemistry) Southern Campus, Bengaluru promoted as Scientist (SS) w.e.f. 1.5.2015.

Retirements/Relieving

- Dr. S. S. Thakur, Principal Scientist, Animal Nutrition Division retired from the Council's service w.e.f. 30.11.2017.
- Dr. Surajit Mandal, Sr. Scientist, Dairy Microbiology Division relieved from ICAR-NDRI, Karnal after tendering technical resignation to enable him to join as Professor in WBUAFS, Kolkata w.e.f. 14.12.2017.

Transfer

- Smt. S. Shashikala, Assistant Administrative Officer, on promotion, was transferred from Southern Campus of NDRI, Bengaluru to NIANP, Bengaluru as Administrative Officer w.e.f. 30-12-2017.

राजभाषा एकक

राजभाषा संबंधी गतिविधियाँ

- » संस्थान के निदेशक एवं कुलपति महोदय की अध्यक्षता में संस्थान राजभाषा कार्यान्वयन समिति की तिमाही बैठक दिनांक 13.12.2017 को संपन्न हुई। बैठक में सभी पदाधिकारियों/वैज्ञानिकों/कर्मचारियों द्वारा प्रत्येक माह के अंतिम कार्यदिवस के दिन अपना संपूर्ण सरकारी कामकाज हिन्दी में निपटाने व कम्प्यूटर पर हिन्दी टाइपिंग के डेस्क प्रशिक्षण के बारे में निर्णय लिया गया।
- » दिनांक 12.10.2017 को नराकास करनाल की ओर से हिन्दी शब्दावली प्रतियोगिता का आयोजन किया गया, जिसमें 39 प्रतिभागियों ने भाग लिया।
- » दिनांक 16.10.2017 को आयोजित राजभाषा पुरस्कार वितरण समारोह में 14.9.17 से 13.10.2017 तक संस्थान में हिन्दी चेतना मास के दौरान आयोजित हिन्दी गीतगायन प्रतियोगिता, हिन्दी शोध-पत्र पोस्टर प्रदर्शन प्रतियोगिता, हिन्दी कार्यशाला, हिन्दी निबंध प्रतियोगिता एवं हिन्दी आशुभाषण प्रतियोगिता के 139 विजेताओं को प्रमाणपत्रों व पुरस्कार राशि से सम्मानित किया गया।
- » दिनांक 9.11.2017 को नगर राजभाषा कार्यान्वयन समिति, करनाल के समन्वय कार्यालय के रूप में संस्थान में डा. आर.आर.बी.सिंह, निदेशक एवं अध्यक्ष, नराकास करनाल की अध्यक्षता में नगर स्तरीय छमाही समीक्षा बैठक का आयोजन किया गया जिसमें करनाल नगर में स्थित 68 केन्द्र सरकार के कार्यालयों, बैंकों, सार्वजनिक क्षेत्र के उपक्रमों आदि के कार्यालय प्रधानों एवं प्रतिनिधियों सहित कुल 100 प्रतिभागियों ने भाग लिया। इस छमाही समीक्षा बैठक में भारत सरकार, गृह मंत्रालय, राजभाषा विभाग के प्रतिनिधि एवं विशिष्ट अतिथि के रूप में श्री प्रमोद कुमार शर्मा, उप निदेशक (कार्यान्वयन), क्षेत्रीय कार्यान्वयन कार्यालय-1, नई दिल्ली शामिल हुए। बैठक में समिति द्वारा विगत छमाही में संपन्न



संस्थान में आयोजित नराकास करनाल की छमाही बैठक में कर्णोदय पत्रिका का विमोचन

हिन्दी श्रुतलेखन प्रतियोगिता के 8, हिन्दी लघुकथा लेखन प्रतियोगिता के 10, हिन्दी शब्दावली प्रतियोगिता के 12, हिन्दी देशभक्ति गीतगायन प्रतियोगिता के 5, हिन्दी निबंध प्रतियोगिता के 3 एवं हिन्दी टिप्पण व मसौदा लेखन प्रतियोगिता के 12 विजेताओं को प्रमाणपत्रों व नकद पुरस्कार राशि से सम्मानित किया गया।



Director, NDRI being felicitated by IJSC Members of NDRI, Karnal

SOUTHERN CAMPUS, BENGALURU

RESEARCH NEWS

Expression Profiling of AGPAT6 Gene towards Milk Fat Synthesis in Post-Partum Deoni Cows

(Sapna Nath and D. N. Das)

In bovines, gene sn-1-acylglycerol-3-phosphate-O-acyltransferase 6 (AGPAT6) plays a cardinal role in catalytic biosynthesis of glycerol lipids and it also involves in the regulatory mechanism of milk fat synthesis of bovine mammary gland by mediating the fatty acids

channels and facilitates voluminous milk fat synthesis. The present investigation was carried out to study AGPAT6 gene (Fig) expression from PBMC of post-partum Deoni cows. Milk samples were taken from nine Deoni cows with mean lactation milk yield of 884.5 kg/in second or higher parity with minimum 4.09 ± 0.10 % fat were selected from LRC at ICAR-NDRI, SRS, Bengaluru. Analysis of relative percentage of AGPAT6 mRNA in PBMCs from each of total nine cows collected each at day of calving, followed by 10th day, 20th day, 30th day, 40th day, 50th day and 60th day post-partum, respectively, were analyzed using quantitative PCR. There was significant increase in expression values

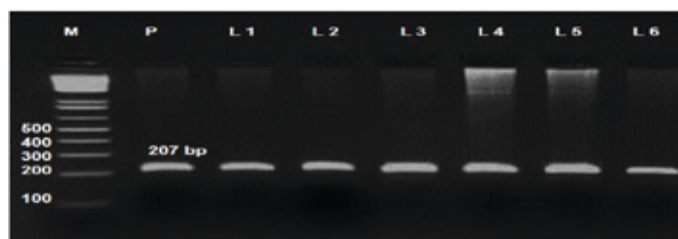


Figure: Agarose gel electrophoresis using RT PCR showing amplified AGPAT6 gene product from Deoni cDNA samples

from day 0 (0.401 ± 0.32) to day 30 (0.653 ± 0.37) followed by day 50 (1.351 ± 1.38) and day 60 (2.065 ± 1.02), respectively. Expression of AGPAT6 was also influenced significantly by stage of lactation (>10-fold at 0 day vs. 60th day). The result clearly indicated that there is a strong role of AGPAT 6 gene for regulating the channelling of fatty acids toward copious milk fat synthesis in bovine mammary during lactation.

LH beta Gene Polymorphism and its Effect on Semen Quality Traits and LH Concentration in Murrah Bulls

(Jagish Kour Reen and K. P. Ramesha)

Polymerase Chain Reaction followed by Single stranded conformational Polymorphism and Sanger Sequencing method was used to study genetic variability in *LHβ* gene in Murrah bulls. Serum LH level was measured by ELISA method. A fixed General Linear Model (GLM) was used to analyze association of Single Nucleotide Polymorphism of *LHβ* gene with semen quality in 109 bull and LH concentration in 80 Murrah bulls.

A total six SNPs were identified in *LHβ* gene g C356090A, g C356113T, g A356701G, g G355869A, g G356330C and g G356606T. Single Stranded Conformational Polymorphism variants of pattern 2 of exon 1 + pattern 2 of exon 2 + pattern 1 of exon 3 had highly significant ($P < 0.01$) effect on sperm concentration (million/ml), percent mass motility, acrosome integrity and membrane integrity in fresh and frozen semen whereas significant ($P < 0.05$) effect was observed on per cent live spermatozoa. SSCP variants of pattern 2 of exon 1 + pattern 2 of exon 2 + pattern 1 of exon 3 had highly significant ($P < 0.01$) effect on luteinizing hormone concentration.

The observed association between SSCP variants of *LHβ* gene with semen quality parameters and LH concentration indicated the possibilities of using *LHβ* as a candidate gene for identification of markers for semen quality traits and LH concentration in Murrah buffaloes.

EXTENSION ACTIVITIES

- A total number of 469 visitors in 12 batches comprising students from various educational Institutes, farmers and entrepreneurs of Southern region visited the campus. The visitors were taken round the various sections and briefed about the ongoing activities.
- Advisory services were rendered to fourteen clientele on dairy business projects, cattle feed formulation, hydroponics and purchase location of indigenous dairy animals.
- Extension literature on clean milk production, indigenous dairy animals and dairy products of the Southern region was distributed to the needy clientele groups during the visits, rural extension programme and exhibitions.

- Mera Gaon Mera Gaurav: Visits were made by the multidisciplinary team to the selected villages of Ramanagara and Bengaluru Rural districts. The team visited farmer households and interacted with the farmers regarding dairy farm management and the problems faced in dairy farming. Necessary technical advice was rendered on various aspects of scientific dairy farming to the farmers as per their needs.
- An orientation programme was organised for 228 dairy farmers/ farm women of Karnataka Milk Federation, in 9 batches from Kolar, Tumkuru, Chikkaballapura, Hassan and Udupi Districts. The farmer-trainees were briefed about the ongoing activities of the campus and were given orientation to green fodder production, scientific dairy farming and clean milk production and were taken round to fodder demonstration unit and livestock research unit as part of exposure programme.
- Under the collaborative Farmer FIRST Programme, ICAR-IIHR and SRS: ICAR-NDRI, animal health camps were organised in the project villages, Kebbe Doddi, Vasappana Doddi and Hosadurga of Ramanagara district. Ninety dairy animals of the beneficiary farmers were treated; Mineral mixture supplementation and urea mineral-lick blocks were distributed to the farmer beneficiaries.
- Participated in the Krishi Mela 2017 organised by UAS, Bengaluru, scheduled during 16th to 19th November 2017 at GKVK, UAS, Bengaluru as part of information dissemination, showcasing the Institute research and extension activities for the benefit of the farming community.

EVENTS

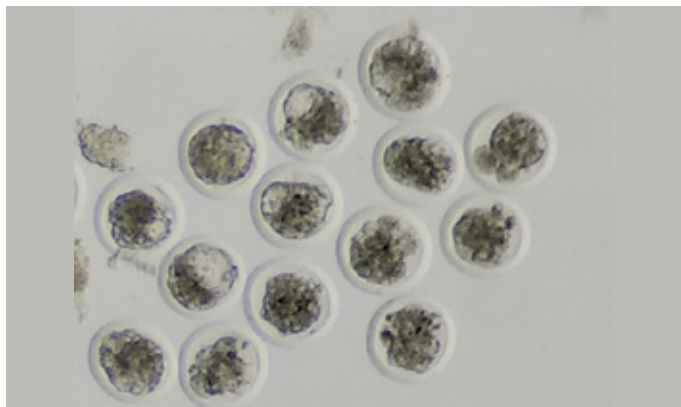
Mass Embryo Transfer Programme of Deoni Cows

Under "Rashtriya Gokul Mission" scheme of Department of Animal Husbandry Dairying and Fisheries, Ministry of Agricultural and Farmers Welfare, Government of India a "Mass Embryo Transfer Programme of Deoni Cows: A Dual Purpose Indigenous Cattle Breed" was organized jointly by Southern Campus of ICAR-NDRI, Bengaluru and Central Frozen Semen Production and Training Institute, Hessarghata on 2nd - 3rd October, 2017 at Southern Campus of ICAR-NDRI with the support of ETT lab, DLF, Hosur.



Deoni cattle herd of Southern Campus, Bengaluru

During the programme, five Deoni animals were super-ovulated and a total of 23 embryos were collected and 13 embryos were transferred to surrogate cows at Livestock farm of the Southern Campus of NDRI, Bengaluru. A record of 14 embryos was produced from a single donor cow (No 377 aged 13 years 6 months) (7th lactation, with best lactation yield of 1595 kg).



Embryos produced

Dr. Suresh S. Honnappagol, Animal Husbandry Commissioner chaired an interactive session with Scientists, Technical Staff and Students of Southern Campus of NDRI and officials from Karnataka Milk Federation, Karnataka State Animal Husbandry Dept, NDDB and other sister organizations for future course of embryo transfer programmes in different breeds of indigenous cattle.



Embryo transfer being carried out

Swaccha Bharath Campaign

As part of the Swachhata Abhiyan, staff and students of Southern Campus, Bengaluru celebrated Swachhata Pakhwada in the month of September and also conducted Swachhata Shramdhaan on October 2nd 2017 by cleaning both the sides of the stretch of Hosur main road in front of the campus. Awareness drive for cleanliness was also carried out in the surrounding residential colonies of the campus.



A view of cleanliness drive

Agricultural Education Day

Agricultural Education Day was celebrated at Southern Campus of NDRI, Bengaluru on 3rd December, 2017. On this occasion, a poster making competition was organized for the students. Two themes were identified, namely 'Role of Agricultural Education in Generating Employment and Entrepreneurship' – for Diploma (DT) students and Dairying – to enhance Farmer's income – for Masters/Ph.D. students.



Students of Southern Campus with the posters designed by them for Agricultural Education Day

Students' Empowerment Programme

As part of student empowerment activities, Southern Campus of NDRI, Bengaluru conducted an interactive session for the students with Mr. Prasant Kumar Prusty, Director, Corporate Quality, Food Safety and Regulatory Affairs, Nature's touch, Canada and Alumni of the NDD programme on 7th December, 2017. The session was chaired by Dr. K. P. Ramesha, Head, Southern Campus. The session was attended by the faculty members and students of the campus.



Mr. Prasant Kumar Prusty, Director, Corporate Quality, Food Safety and Regulatory Affairs, Nature's touch, Canada, addressing the students

EASTERN CAMPUS, KALYANI

RESEARCH NEWS

Alteration of Micro-environment of Cow-shed Enhanced Animal Comfort and Milk Yield in Jersey Crossbred Cows

(Dharma Sahu, D. K. Mandal, A. Mandal, A. Chatterjee, Saroj Rai, M. Karunakaran C. Bhakat and T. K. Dutta)

Modification of cow-shed was done by use of paddy straw as thermo-protective roof ceiling material and provision of floor comfort by constructing sand bed. Observations on effect of soft flooring and roof thermal-insulations were investigated by subjecting 10 lactating cows as experimental (T1) and 10 as control (T0) group at Eastern Campus of NDRI, Kalyani, West Bengal. Modified house diminished the stress conditions of animals by reducing 5-7°C roof temperature. Floor surface temperature of sand bed was also significantly lower than concrete surface temperature. Thermal and flooring comfort also significantly reduced rectal temperature, pulse rate and respiration rate of experimental cows as compared to the control group. During summer season, there was significantly higher temperature (°C) in T0 shed compared to T1 shed during peak hours in a day. During evening, difference of temperature was non-significant. During winter also the trend was similar to that of summer. The results indicated that insulation by paddy straw ceiling reduced the thermal radiation and hence created better thermo-comfortable environment in the modified shed as compared to existing shed.

Milk yield (kg/d) was significantly higher in cows kept with housing comfort as compared to control group. On overall basis, cows kept in thermo-comfortable soft floored shed produced 380g more milk per cow per day. Higher sub-clinical mastitis test score (MCMT grade) in T0 group compared to the T1 indicated better udder health status in cows kept in stress ameliorated shed. Somatic cell count, an indicator of milk quality and proneness to sub-clinical mastitis was higher in T0 as compared to T1 group, however, statistically not significant.



Roof ceiling thermo-protection by paddy straw and floor comfort by sand bed in cow shed

Due to cushioning effect of sand floor, lesions on knee, hock, leg and other parts of body in T1 group animals were significantly less compared to cows kept on concrete floor. Hoof lesions score was higher in T0 compared to T1, however, did not differ significantly. Locomotion score was poorer in T0 as compare to T1.

EXTENSION ACTIVITIES

- A training programme on "Scientific Goat Farming" was organized during 14th-18th November, 2017. Total thirteen participants from Hooghly, North 24 paragona, Nadia, West Midnapore districts of West Bengal participated in the programme. Faculty of the campus provided the training on different aspects of scientific goat farming.
- Two Veterinary health & Vaccination camps were organised in Ghoshaldanga, Birbhum and in Shirshi, Jhargram Districts. In these camps, Birbhum district 265 cattle, 62 calves and 49 buffaloes were vaccinated against FMD, HS, BQ. A total number of 237 numbers of goats and 24 sheep were vaccinated against PPR and 342 birds were vaccinated with R B Vaccine.



Veterinary services being rendered

- Two Scientists-Farmers interaction sessions in different tribal villages were organized to enhance the knowledge of tribal farmers (144) about recent advances in scientific dairy farming in Ghoshaldanga, Birbhum districts and Shirshi, Binpur-2 Block of Jhargram districts. In these interaction sessions, a team of subject matter specialists of Eastern Campus, Kalyani interacted with the farmers on different aspects related to importance of feeding mineral mixture, vaccination and deworming, important green fodder varieties and their cultivation practices, artificial insemination and heat detection, azolla production, clean milk production, round the year fodder production.
- Mineral mixture (146 kg) was distributed among 144 tribal farmers in Ghoshaldanga and Shirshi villages of West Bengal and method of feeding mineral mixtures to animals was demonstrated. For ensuring sustainable livelihood, a total number of 440 chicks, poultry feed were distributed among tribal farmers in the same villages.



Mineral mixture being distributed among tribal farmwomen

- Scientists-farmers interaction session cum veterinary health camp was organized in Tripura. Several inputs were also distributed among farmers. One Scientists-Farmers interaction-cum-off campus training programme was organised in Bagma village of Tripura state, in which total 136 farmers enhanced their knowledge pertaining to scientific dairy farming. In the camp, veterinary medicines, mineral mixture, 50 Black Bengal goats and 500 chicks were distributed among the farmers. Apart from that, regular SMS in Bengali language pertaining

to various aspects of scientific dairy farming were sent to the registered farmers of Tripura.

- Two day awareness programmes on scientific rearing of different livestock and distribution of various inputs like mineral mixture, vitamins supplements, medicine, dewormer in the villages of Mizoram (durtlang and Seilesih) were jointly organized by Eastern Campus, Kalyani, West Bengal and College of Veterinary Sciences under CAU, Mizoram. Total 150 farmers from different villages participated in this programme. Total 800 broiler chicks were distributed among 80 farmers and 20 piglets were distributed among 20 farmers alongwith feeds.



Dairy farming inputs being distributed to farming community



Dr. R. R. B. Singh, Director, NDRI with winning team of North Zone Championship organised at IISR, Lucknow on 2nd November, 2017

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