

वार्षिक प्रतिवेदन

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2024

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भारत

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(Indian Council of Agricultural Research)

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Annual Report 2024

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PREFACE

Cattle rearing remains a fundamental part of rural life in India. It is not merely a traditional practice but a vital source of livelihood, food security, and employment for millions, especially among small and marginal farmers and rural women. The sector plays a key role in the national economy, linking agriculture, dairy production, and rural development. As per the FAO, 2023, the country possesses 194.48 million cattle making up 12.3% of the global cattle stock. These animals provide multiple benefits, extending far beyond milk production. Cattle are indispensable for their contribution to organic farming through manure, which enhances soil fertility and sustains crop yields, thereby reinforcing the synergy between animal husbandry and agriculture. In terms of dairy production, India leads the world, with a remarkable 239.30 million tonnes of milk produced in 2023–24. This figure marks a more than 51% increase from 2014–15, underlining significant growth in the dairy sector. India now contributes nearly 25% of the global milk output, and the per capita milk availability stands at 471 grams per day, a testament to the sector's robust infrastructure and the sustained efforts of millions of dairy farmers. However, despite these achievements, disparities in milk productivity persist between breeds. Exotic and crossbred cattle average 8.43 kg of milk per day, while indigenous and non-descript breeds yield significantly less—around 3.54 kg per day. This productivity gap underscores the urgent need for strategic interventions to enhance the performance of native breeds without compromising their unique genetic traits and adaptability. This dual challenge of genetic conservation and productivity improvement lies at the heart of the mission of the ICAR-Central Institute for Research on Cattle (ICAR-CIRC), located in Meerut.

Established over 37 years ago, the Institute has evolved into a national hub for advanced cattle research and development. ICAR-CIRC has been instrumental in various scientific initiatives ranging from genetic improvement and breeding technologies to semen production and farmer training. One of the Institute's most notable achievements is the development of Frieswal™, a synthetic high-yielding dairy breed under the All India Coordinated Research Project (AICRP) on Cattle. Frieswal™ is a unique cross with 62.5% Holstein Friesian and 37.5% Sahiwal genetics. It combines the high milk yield of exotic breeds with the adaptability of indigenous ones, boasting a lactation yield of 3,628 kg over 305 days, and a peak yield of over 45 kg/day. In December 2024, Frieswal™ was formally recognized through a Gazette Notification, a major milestone validating years of dedicated research. Under the Rashtriya Gokul Mission, the Institute produced 86,434 semen doses during 2024–25, including 73,144 from Frieswal bulls and 13,290 from Sahiwal bulls—a clear indication of its focus on high-quality germplasm. The Institute is continuously expanding its scope of research and development. Pioneering efforts have been made in Embryo Transfer Technology (ETT) using sex-sorted semen, helping to selectively increase the population of female calves. This year, two such calves were successfully produced, bringing the total to 15 so far. Cumulatively, the Institute has produced 52.31 lakh doses of Frieswal semen and 74,971 doses from Sahiwal, with a substantial reserve still in stock for distribution and future use. In addition to semen production, ICAR-CIRC is making strides in cryobanking of somatic cells for rare indigenous breeds like Badri, Pullikulum, and Khariar, ensuring the preservation of genetic diversity for future generations. Research initiatives have also ventured into field validation of mineral mixtures tailored for cattle health, particularly in regions like Udham Singh Nagar and Haridwar in Uttarakhand. The Institute has also added new breeds such as Tharparkar and Rathi to its research pool, and expanded its collaboration under AICRP with institutions like Kamdhenu University (Durg), BASU (Patna), IVRI (Izatnagar), RAJUVAS (Bikaner), and DUVASU (Mathura).

A major infrastructural milestone was reached with the construction of the boundary wall for the new campus at Babugarh, Hapur. This paves the way for further development and expansion. The notable outputs of the year include, two design registrations and one breed registration were secured. In terms of research projects, 15 proposals were submitted to leading agencies including DST, NASF, UPCAR, and Viksit Bharat. Six internal projects were approved by the institute with focus on emerging domains such as artificial intelligence in livestock management, ICT tools in cattle husbandry, climate resilience, transgenics, and dairy-based nutraceuticals. This year, student engagement remained strong, with nine students from SVPUA&T and MIET receiving dissertation training, and three MVSc students conducting their thesis research at the Institute. A Milk Processing and Incubation Lab also became operational this year, and FSSAI registration was obtained to ensure quality and compliance. Additionally, the vermicomposting unit was scaled up and a mechanical composting system was installed to support waste-to-wealth initiatives. ICAR-CIRC extended its services across 13 states, reaching farmers under initiatives like SCSP, TSP, and NEH. A total of 48 training programs were held under these schemes, alongside the establishment of two custom hiring centers to provide accessible machinery for smallholders. The Farmer FIRST Programme (FFP) made a tangible impact with 23 animal health camps serving 1,230 animals, and 52 outreach visits benefiting nearly 1,000 farmers and over 450 farm families. The Institute also participated in 10 agricultural exhibitions (Kisan Melas) and hosted four educational tours for students and farmers, reinforcing its commitment to knowledge dissemination.

The year witnessed important academic and professional exchanges. ICAR-CIRC hosted the SAPICON-2024 international conference, and a National Symposium in collaboration with the Indian Dairy Association (IDA, Western UP Chapter) and SVPUA&T, Meerut. An international delegation from Brazil visited the campus, underscoring global interest in India's cattle research. The Institute also held two brainstorming sessions, a workshop on Intellectual Property Rights, and several training and farmer interaction programs, including one on the ODOP scheme.

As India moves toward a more productive and sustainable livestock sector, ICAR-CIRC remains at the forefront. Its work embodies a vision of increased productivity, profitability, and genetic conservation of indigenous breeds, while meeting the evolving demands of farmers, industry, and policymakers alike. The accomplishments of this past year reflect the unwavering efforts of dedicated scientists, staff, and collaborators. Gratitude is extended to the Secretary, DARE; DG, ICAR; DDG (Animal Science); and all partner institutions. Special recognition goes to the team responsible for compiling this comprehensive annual report.

This publication is not just a record of achievements—it is a testament to a year of innovation, progress, and service to rural India and beyond. With steadfast commitment, ICAR-CIRC continues to lead India's cattle research landscape toward a brighter, more sustainable future.

Jai Hind!

ICAR-CIRC: AN INTRODUCTION

ICAR-Central Institute for Research on Cattle, a premier institute of Indian Council of Agricultural Research is an autonomous organization under Department of Agricultural Research and Education, Ministry of Agriculture and Farmers Welfare, Government of India. The institute formerly known as Project Directorate on Cattle (PDC) was established on 3rd November 1987 at Military Farms School and Research Centre, Meerut by upgrading the status of All-India Coordinated Research Project (AICRP) on Cattle. The Directorate was actively collaborating with the Military Farms, Ministry of Defence to evolve a national milch crossbred cattle “Frieswal” by crossing Holstein Friesian (5/8) with Sahiwal (3/8) cattle. Considering importance of the Indigenous cattle breeds for their adaptability, feed conversion efficiency, disease resistance etc. the Indigenous Breeds Project was started in collaboration with State Agricultural Universities and State Government, Non-Government Organizations and sister ICAR Institutes for conservation and genetic improvement of some of the important indigenous cattle breeds of our country viz., Gir, Sahiwal, Kankrej, Hariana and Ongole. During the 8th Five Year Plan, Field Progeny Testing programme (FPT) was also started to undertake progeny testing of crossbred bulls under field conditions. Considering its sincere research and extension efforts and achievements made in cattle improvement, the PD on Cattle was upgraded as Central Institute for Research on Cattle (CIRC) in 2014. Thereafter, CIRC is acting as a nodal institution to monitor, coordinate and support all research and development projects for cattle improvement. The Institute is also providing good quality male germplasm to stakeholders. So far institute has produced 50.6 lakhs of semen dosages out of which 23.4 lakh doses of genetically superior bulls available are available with institute for stakeholders. On an average, Institute add 1.5 lakhs of semen dosages from the bulls maintained at its farm. Besides these, semen productions also take place at 3 germ plasm units and under AICRP. The increase to tune of 33, 44 and 24% have been achieved for Gir, Kankrej and Sahiwal cattle respectively since inception of IBP programme whereas under FPT programme more than 50% increase in milk production has been achieved from Frieswal cattle. The institute is likely to include some more indigenous breeds viz Tharparkar and Rathi and initiating some new The Institute also obtained ISO 9001:2015 certification and has well equipped semen freezing and molecular genetics laboratories besides feed testing facilities in animal nutrition laboratory. Besides institutional research programme on cattle genetics, nutrition, reproduction and management, sponsored research projects from DST, Government of India are also regularly handled by the institute scientists. Institute also have good linkage with other ICAR institutes and SAUs and excuting collabrative research programme too.

VISION

The vision of ICAR-CIRC is “Improvement of cattle for high productivity and profitability.”

MISSION

Germplasm improvement and technology development for realizing enhanced productivity and profitability.

MANDATE

Basic and strategic research on productivity and production enhancement of cattle including indigenous cattle.

Dissemination of scientific information and technology for cattle production management.

OBJECTIVES

To undertake research in the field of cattle breeding, feeding, management and reproduction to enhance productivity and profitability.

2. To plan, coordinate and monitor the research projects on cattle.

3. To serve as national data repository and provide consultancy for cattle production and reproduction.

AICRP on Cattle

The All India Coordinated Research Project on Cattle was launched by the Indian Council of Agricultural Research, Department of Agricultural Research & Education, Ministry of Agriculture, Government of India, in year 1968-69 at Indian Veterinary Research Institute (Izatnagar and Haryana Agriculture University (HAU), Hissar. The project was originally called All India Coordinated Research Project for studying behavioral pattern of zebu cross breed cattle, but merged into AICRP on cattle in 1969. The project goal was to develop new dairy breeds in tropical regions through cross breeding. In order to achieve the goal ICAR started the Frieswal project in collaboration with the Ministry of Defence to evolve a national milch breed “Frieswal” by crossing the Holstein Friesian and Sahiwal cattle and established at Project Directorate on Cattle, at Meerut which was upgraded at Central Institute for Research on cattle in 2014. In the beginning the programme was started as Frieswal project. Subsequently, keeping in view the importance of indigenous breeds, known for their adaptability and disease resistance qualities, Indigenous Breeds Project (IBP) was also started in collaboration with the State Veterinary/Agricultural Universities, State Government, Non-Government Organizations and Gaushalas. Similarly, Field Progeny Testing (FPT) project was also initiated to bring about improvement in crossbred cattle at farmers` herd in collaboration with the SAUs, State Govt. and Non-Government Organizations. The Project is currently operating from 17 centers covering 6 states and 6 agro-climatic zones of India.

7. Objectives of AICRP on Cattle

1. To develop a national milch breed of cattle ‘Frieswal’ using Holstein Friesian X Sahiwal base.
2. Conservation and genetic improvement of important indigenous cattle breeds.

3. Production of progeny tested crossbred bulls and genetic improvement of cattle under field conditions.

PRESENT THRUST AREAS

1. Genetic improvement of important indigenous breeds of cattle viz. Gir, Kankrej and Sahiwal, Tharparkar, Rathi, etc. using conventional and modern breeding techniques
2. Large scale production of quality cattle germplasm.
3. Development of optimum feeding schedules for Indigenous and crossbred cattle from diverse agroclimatic zone.
4. Development of management practices including designing of shelter to suit the local environment for enhancing cattle productivity.
5. Genomic selection of bulls and production of elite bulls available for semen production
6. Faster multiplications of superior germ plasm using advanced assisted reproductive technologies such as ovum pick up, invitro fertilization and embryo transfer use of embryo transfer technology for elite bull production.
7. Comparative economics of productivity of Indian cattle breeds vis-à-vis crossbred cattle

FUTURE THRUST AREAS

1. Utilization of biotechnological approaches such as genome editing and transgenics for managing biotic and abiotic stresses, controlling diseases, enhancing productivity in cattle, and developing a library of cell and gene clones from indigenous breeds.
2. Assessment of draught power potential in key indigenous draught breeds and biomechanical evaluations aimed at improving their working efficiency.
3. Sexing of male germplasm for production of calves of desired sex.
4. Scientific validation of the therapeutic properties of cow-derived products such as milk, Panchgavya, urine, and dung.

INFRASTRUCTURE

Location

ICAR-Central Institute for Research on Cattle, is located at Grass Farm Road, Meerut Cantt. Meerut (UP). In proximity with national capital (70Km), it is well connected to major cities of India by air, rail and road. The nearby railway stations are Meerut Cantt (2.7 KM) and Meerut City Station (4.8 KM), while there are two bus depots *Soahrab Gate* and *Hapur Adda* from where taxi, auto-rickshaws are readily available round the clock to reach the institute campus.

<https://maps.app.goo.gl/2tPfqMjY3RQXeg119>

Germplasm Resources

The Institute is actively engaged in research programs aimed at the genetic improvement of indigenous and crossbred cattle by establishing Germplasm (GP) and Data Recording (DR) units across various government and non-government organizations. The Frieswal cattle population is currently maintained at ICAR-NDRI,

Karnal, with an inventory of 102 superior-quality Frieswal cows. The bull rearing facility is located in Meerut and houses 94 elite bulls. Similarly, indigenous cattle genetic resources are preserved at designated GP and DR units for each breed. The germplasm unit for the Sahiwal breed is located at ICAR-NDRI, Karnal (Haryana), while the units for Gir and Kankrej breeds are situated at the Junagadh and Dantiwada campuses of Kamdhenu University, Gandhinagar (Gujarat), respectively. From this year, the Institute has also included two additional breeds—Tharparkar and Rathi—with their respective GP and DR units established at IVRI, Izatnagar, and RAJUVAS, Bikaner.

Research Laboratories

The Institute houses eight advanced laboratories that support both basic and applied research in the areas of animal genetics and breeding, animal nutrition, cattle physiology and reproduction, and molecular genetics. The Semen Freezing Laboratory is equipped with cutting-edge infrastructure for the cryopreservation of bovine semen. Additionally, three new laboratories have been established this year: The Tissue Culture and Biochemistry Laboratory, Milk Processing cum Incubation Laboratory, and Clinical Veterinary and Medicine Laboratory.



Semen Freezing Laboratory



Animal Physiology Laboratory



Semen Quality Control Laboratory



Molecular Biology Laboratory (CGB)



Animal Nutrition Laboratory



Tissue Culture and Biochemistry Laboratory



Milk Processing Cum Veterinary Clinical Laboratory
Incubation Laboratory

Male Germ Plasm Unit:

The unit comprises six animal sheds in total, with four designated for adult animals. It also includes a dedicated isolation shed. Furthermore, two bull exercisers have been installed within the unit. Additional facilities include a separate veterinary care center, a storage godown for feed and fodder, and a chaffing section.



Adult bull shed under collection at ICAR-CIRC Farm

Computer Centre/ ARIS/IT Cell

The Institute has a well-equipped ARIS Cell with 100 Mbps internet connectivity provided by NKN, NIC, New Delhi. The Cell ensures LAN and Wi-Fi connectivity for all staff, facilitating smooth execution of research activities, FMS/MIS operations, eOffice, and other official tasks. The ARIS Cell has developed and regularly updates the Institute's website (<https://circ.icar.gov.in>) to highlight various institutional activities. It is also responsible for the repair and maintenance of computers, printers, scanners, UPS systems, and more. Additionally, the Cell manages the central video conferencing facility and supports the organization of key meetings and webinars in online mode. During the year, nine high end computers along with heavy duty printer and scanners were procured to support different divisions of the institute for routine functioning

Library

The library houses a collection of 2,379 books across a wide range of subjects. It provides readers with access to three Hindi newspapers—Dainik Jagran, Amar Ujala, and Dainik Hindustan—and one English daily, the Times of India, along with seven Hindi and five English literary magazines. Library services are also available to affiliated organizations and students of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut. Moreover, online journals through CeRA are accessible as well.



ICAR-CIRC Staff in institute library

Semen Distribution Centre

The semen distribution and sale counter operates at the main gate of the institute, where stakeholders, farmers, and paravets can purchase semen from Frieswal and indigenous cattle

breeds including Sahiwal, Kankrej, and Gir on any working day. During 2023, the center sold 17,220 doses of Frieswal semen, along with 759 doses of Sahiwal semen respectively, generating revenue of **Rs. 2,20,250**. The SDS also serves as a single window system for selling other institute products such as milk from the experimental dairy farm, vermicompost, earthworms, and farmyard manure from the vermicompost unit. The sales counter operates during office hours from 9:00 AM to 5:30 PM.



Frozen semen and other products sale counter at ICAR-CIRC Campus

Experimental Dairy Farm

The Experimental Dairy Unit at ICAR-CIRC comprises 20 Frieswal cows, 10 Sahiwal cows, and 2 Sahiwal heifers. The unit is primarily used for conducting targeted trials on superovulation and embryo transfer technology (ETT). Additionally, the animals are involved in research related to ovum pick-up techniques and in vitro fertilization. On average, the unit produces 80 litres of milk per day, which is supplied to employees at prescribed rates. To further strengthen the female herd, 18 new Tharparkar animals were added to the Institute's livestock this year.



Farm Section

The Institute manages a 10-acre green fodder farm where it cultivates a range of crops vital for livestock nutrition. These crops include Hybrid Napier, oats (jai), sorghum (jwar), pearl millet (bajra), and mustard (sarson). During the reporting year, the farm section successfully harvested a total of 4680.8 quintals of these key fodder crops, ensuring adequate nutritional support for the bulls and cows housed at the Institute.



Fodder Farm of ICAR-CIRC

Amrit Vatika

Amrit Vatika was established at the Institute on 10th August 2023 as part of the “Meri Maati Mera Desh” initiative under the Azadi Ka Amrit Mahotsav programme. The vatika features a variety of medicinal plants, including Arjun (*Terminalia arjuna*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*), Shatawari (*Asparagus racemosus*), Patthar Chatta (*Kalanchoe pinnata*), Chirchita (*Achyranthes aspera*), Aadu (*Prunus persica*), Turmeric (*Curcuma longa*), Sonth (*Zingiber officinale*), Aonla (*Phyllanthus emblica*), etc. were planted in this vatika.



Vermicompost Unit

A significant quantity of dung biomass is produced daily at ICAR-CIRC from animals maintained in the Male Germplasm Unit and the Female Cattle Herd. Processing this biomass is crucial to avoid potential nuisance and environmental pollution within the campus. On average, around 1.5 quintals of dung biomass are generated each day. This material is converted into vermicompost at the vermicomposting unit using the vermiculture technique. The earthworm species *Perionyx ceylanesis* is employed due to its ability to thrive in a wide temperature range (2–46°C), its high reproductive rate—producing more hatchlings per cocoon, more cocoons weekly, and a larger earthworm population within three months—as well as its extended lifespan. The existing Vermicomposting unit of the Institute was expanded and also mechanical composting was initiated during this year. At present, the Institute operates fifteen vermibeds, with ongoing efforts to expand the facility.

In the year under report the unit processed the available dung biomass to vermicompost and Farm yard manure (FYM). After utilization at institute level for maintaining a geographical area of 30 acre, the unit sold out 30310 Kg of vermicompost, 2718 quintal of farm yard manure and 27kg earth worms to farmers of near by villages fetching a revenue of Rs 384658 only. Unit also prepared vermiwash and was utilized on institutional farm.



Vermicompost Unit of ICAR-CIRC

Guest House

The Institute also provides guest house facilities. As per the Council's directives, the available Type-IV quarters are currently being utilized for this purpose, offering accommodation for up to eight individuals at a time. The guest house also serves officials and visitors arriving at the Institute during office hours.



ICAR-CIRC Guest House

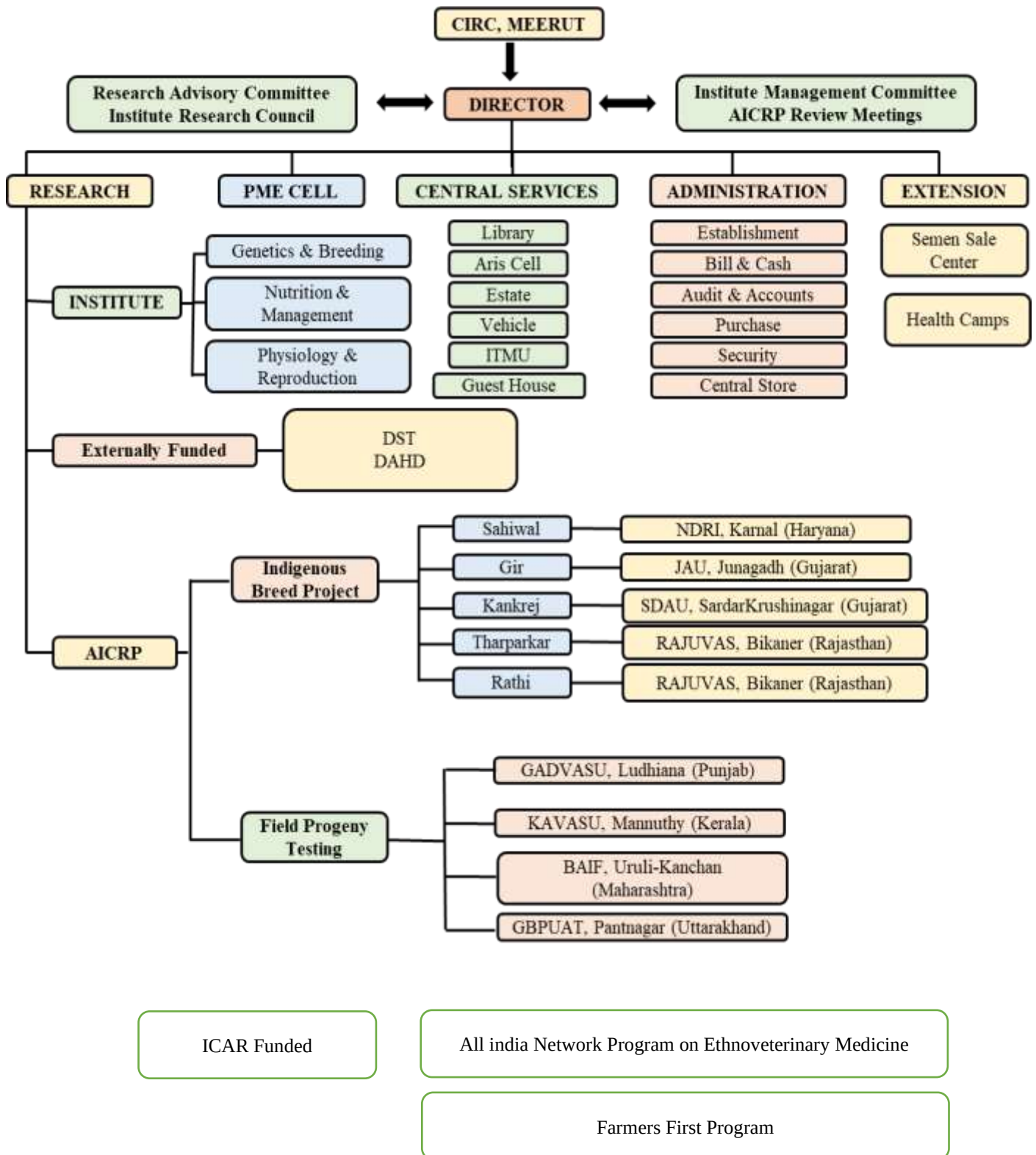
Residential Complex

At present, the Institute has a total of residential quarters, including Type-V (01), Type-IV (02), Type-III (04), Type-II (04), and Type-I (05) units. The Type-IV quarters are utilized as the Institute's Guest House, while one of the Type-I quarters serves as a Kisan Hostel. The Type-V quarter is designated as the Director's residence.



Residential quarters of ICAR-CIRC

ORGANOGRAM



कार्यकारी सारांश

अखिल भारतीय समन्वित गौवंश अनुसंधान परियोजना

प्रजनन परीक्षण के माध्यम से देशी गौवंशों की नस्ल सुधार देशी नस्ल परियोजना -

- गिर, कांकरेज और साहीवाल जैसी देशी नस्लों के बेहतरीन गायों और सांडों के चयन के माध्यम से नस्ल सुधार किया गया। यह चयन विशेष जनन द्रव्य इकाइयों और उनसे जुड़ी पशुधन इकाइयों में किया गया।
- ये जनन द्रव्य इकाइयाँ जूनागढ़ के पशुधन प्रजनन फार्म (गुजरात), दांतीवाड़ा के पशुधन (गुजरात) में (एनडीआरआई) के राष्ट्रीय डेयरी अनुसंधान संस्थान (हरियाणा) अनुसन्धान केंद्र और करनाल स्थित हैं। इनके साथ जुड़ी पशुधन इकाइयाँ खेतों में किसानों द्वारा पाले जा रहे पशुओं से संबंधित हैं, जिन्हें विभिन्न संस्थाओं का सहयोग प्राप्त है।

गिर नस्ल:

- गुजरात के जूनागढ़ स्थित पशुधन प्रजनन फार्म में गिर गायों के लिए स्थापित जनन द्रव्य इकाई में 156 पशु रखे गए, जबकि डेटा रिकॉर्डिंग इकाई में 252 पशु शामिल थे। इनमें से 91 प्रजनन योग्य मादा पशुओं की पहचान की गई और उन्हें जनन द्रव्य इकाई में पंजीकृत किया गया।
- कुल 40 सांडों से पाँच सेटों में वीर्य संग्रह किया गया, जिससे 5,975 वीर्य इकाई तैयार की गई। इनमें से 3,295 इकाई कृत्रिम गर्भाधान के लिए उपयोग की गईं, जबकि 2,58,145 इकाई भविष्य में उपयोग हेतु संग्रहित हैं।
- कुल 52 कृत्रिम गर्भाधान किए गए, जिनमें से 19 गर्भ सुनिश्चित हुई। परियोजना की शुरुआत से अब तक कुल 209 बेटियाँ उत्पन्न हुई हैं।
- जनन द्रव्य इकाई में 305 दिनों की औसत दूध उत्पादन, कुल दुग्धकाल, अधिकतम दूध उत्पादन और दुग्ध अवधि क्रमशः 2,163.20 किलोग्राम, 3,538.60 किलोग्राम, 11.10 किलोग्राम और 563.30 दिन रही। डेटा रिकॉर्डिंग इकाई में यही आंकड़े क्रमशः 2,217.5 किलोग्राम, 3,315.80 किलोग्राम, 11.40 किलोग्राम और 533.80 दिन दर्ज किए गए।

कांकरेज नस्ल:

- कांकरेज नस्ल की जनन द्रव्य इकाई गुजरात के गांधीनगर स्थित कामधेनु विश्वविद्यालय के अधीन दांतीवाड़ा के लाईवस्टॉक रिसर्च स्टेशन में स्थापित है। यह इकाई पाँच डेटा रिकॉर्डिंग इकाइयों और 13 कृत्रिम गर्भाधान (AI) केंद्रों के माध्यम से कार्य कर रही है, जो 64 गाँवों में 5,100 किसानों की 6,200 कांकरेज गायों को कवर करती है।
- इस जनन द्रव्य इकाई में 58 पशुओं का समूह बनाए रखा गया, और 48 कांकरेज सांडों को छह अलग-अलग सेटों में शामिल किया गया।
- कुल 9,478 वीर्य इकाई तैयार की गईं, जिनमें से 7,649 इकाई का कृत्रिम गर्भाधान के लिए उपयोग किया गया। वर्तमान में 1,32,930 इकाई भविष्य के प्रजनन कार्यक्रमों के लिए उपलब्ध हैं। कुल 1,867 गर्भाधान किए गए, जिनसे 988 गर्भ सुनिश्चित हुई। परियोजना की शुरुआत से अब तक कुल 4,926 बेटियाँ उत्पन्न हुई हैं।

- जनन द्रव्य इकाई में 305 दिनों की औसत दूध उत्पादन, कुल दुग्धकाल, अधिकतम दूध उत्पादन और दुग्ध अवधि क्रमशः 2,522.78 किलोग्राम, 2,869.80 किलोग्राम, 12.10 किलोग्राम और 475 दिन रही। वहीं, डेटा रिकॉर्डिंग इकाइयों में ये आंकड़े क्रमशः 1,696.95 किलोग्राम, 1,862.24 किलोग्राम, 8.93 किलोग्राम और 312.00 दिन दर्ज किए गए।

साहीवाल नस्ल:

- साहीवाल गायों की जनन द्रव्य इकाई एनडीआरआई, करनाल में स्थापित की गई है (हरियाणा), जबकि डेटा रिकॉर्डिंग इकाइयाँ क्षेत्रीय अनुसंधान एवं प्रशिक्षण केंद्र, कलझरानी (बठिंडा); जीएडीवीएएसयू, लुधियाना; गोविंद बल्लभ पंत कृषि एवं प्रौद्योगिक विश्वविद्यालय, पंतनगर (उत्तराखंड); और लुवास, हिसार के पशु फार्म में स्थित हैं।
- जनन द्रव्य इकाई में कुल 455 पशुओं की संख्या दर्ज की गई, जबकि सभी इकाइयों में कुल 655 प्रजनन योग्य मादा पशु चिह्नित की गईं। इसके अतिरिक्त, वंश परीक्षण के लिए 43 साहीवाल सांडों को शामिल किया गया।
- रिपोर्टिंग अवधि के दौरान कुल 35,449 वीर्य इकाई तैयार की गईं, जिनमें से 15,088 इकाई का उपयोग कृत्रिम गर्भाधान में किया गया। भविष्य के उपयोग हेतु 2,01,578 इकाई का भंडारण किया गया है। कुल 829 गर्भाधान किए गए, जिनमें से 367 गर्भ सफल रहें। परियोजना की शुरुआत से अब तक 1,760 बेटियाँ उत्पन्न हुई हैं।
- जनन द्रव्य इकाई में साहीवाल नस्ल की औसत 305-दिन की दूध उत्पादन क्षमता 2,201.35 किलोग्राम, कुल दुग्ध उत्पादन 2,072.51 किलोग्राम, अधिकतम दुग्ध उत्पादन 10.16 किलोग्राम, और औसत दुग्ध अवधि 245.55 दिन दर्ज की गई।
- डेटा रिकॉर्डिंग इकाइयों में, पंतनगर ने 2,017.93 किलोग्राम के साथ सबसे अधिक 305-दिन की औसत दूध उत्पादन दर्ज की, जबकि हिसार में सबसे कम 1,684.43 किलोग्राम दर्ज की गई। सबसे अधिक कुल दूध उत्पादन लुधियाना 2,209.35 किलोग्राम में रहा (, और सबसे कम हिसार 1,684.43 किलोग्राम में रहा। (दुग्ध अवधि लुधियाना में 356.88 दिन, हिसार में 234.00 दिन और पंतनगर में 300.09 दिन रही।

क्षेत्रीय परिस्थितियों में संकर गायों का आनुवंशिक सुधार – फील्ड प्रोजेनी टेस्टिंग परियोजना)एफपीटी(

- फील्ड प्रोजेनी टेस्टिंग कार्यक्रम देश के विभिन्न कृषि जलवायु क्षेत्रों में चार इकाइयों के माध्यम से- जीएडीवीएएसयू :संचालित किया गया। ये इकाइयाँ थीं, लुधियाना (पंजाब); केवीएएसयू, त्रिशूर (केरल); बीएआईएफ, पुणे(महाराष्ट्र) ; और जीबीपीयूएटी, पंतनगर ।(उत्तराखंड)

केरला पशुचिकित्सा एवं पशु विज्ञान विश्वविद्यालय, त्रिशूर)KVASU):

- कुल 18 सेटों में लगभग 363 सांडों को शामिल किया गया, जिनसे 1,60,284 कृत्रिम गर्भाधान किए गए। इसके परिणामस्वरूप 13,921 बेटियाँ उत्पन्न हुईं, जिनमें से 3,917 ने पहला व्यांत करने की आयु प्राप्त की।
- कुल 5,004 गर्भाधान किए गए, जिनकी औसत गर्भधारण दर 47.98% रही। बछियों ने पहले 305 दिनों की दुग्ध अवधि में औसतन 3,322.07 किलोग्राम दूध उत्पादन किया, जबकि पहली व्यांत की औसत

आयु 990.79 दिन दर्ज की गई। प्रारंभिक 17 सांड सेटों से 3,917 बछियों ने अपनी पहली दुग्ध अवधि पूरी की।

- दुग्ध उत्पादन में निरंतर वृद्धि देखी गई) पहले सेट—1992) में 1,958.4 किलोग्राम से बढ़कर नवीनतम सेट में 3,322.07 किलोग्राम तक, जो 1,363.67 किलोग्राम (69.6%) की महत्वपूर्ण वृद्धि को दर्शाता है।
- साथ ही, पहली व्यांत की औसत आयु में भी कमी दर्ज की गई पहले सेट की बछियों में—1,136.4 दिन से घटकर 17वें सेट की बछियों में 990.79 दिन, जो 145.6 दिन (12.81%) की उल्लेखनीय कमी है।

गुरु अंगद देव पशुचिकित्सा एवं पशु विज्ञान विश्वविद्यालय, लुधियाना, पंजाब (GADVASU):

- कुल 18 सांड सेटों में लगभग 382 सांडों को शामिल किया गया, जिससे 1,82,381 कृत्रिम गर्भाधान किए गए। इसके परिणामस्वरूप 26,880 बेटियाँ उत्पन्न हुईं, जिनमें से 8,960 ने पहला व्यांत करने की आयु प्राप्त की।
- कुल 4,864 गर्भाधान किए गए, जिनकी औसत गर्भधारण दर 48.20% रही। प्रारंभिक 17 सांड सेटों से लगभग 7,113 बछियों ने 305-दिन की पहली दुग्ध अवधि पूरी की।
- पहले 305-दिन की दुग्ध अवधि में औसत दूध उत्पादन 3,935.8 किलोग्राम रहा, जबकि पहली व्यांत की औसत आयु 1,021.56 दिन दर्ज की गई।
- सांड सेटों के साथ दूध उत्पादन में निरंतर वृद्धि देखी गई) प्रथम सेट—1995) में 2,697.8 किलोग्राम से बढ़कर 16वें सेट (2023) में 3,935.8 किलोग्राम तक, जो 1,238.0 किलोग्राम (45.88%) की उल्लेखनीय वृद्धि को दर्शाता है। इसके विपरीत, पहली व्यांत की औसत आयु में 1,192 दिनों से घटकर 1,021.56 दिन तक की कमी देखी गई, जो कि 170.4 दिन (14.29%) की उल्लेखनीय गिरावट है।

बाइफ डेवलपमेंट रिसर्च फाउंडेशन, सेंट्रल रिसर्च स्टेशन, उरुलीकांचन-, पुणे:

- कुल 17 सांड सेटों में 359 सांडों का उपयोग करते हुए 1,56,569 कृत्रिम गर्भाधान किए गए, जिससे 19,829 मादा संतानों का जन्म हुआ, जिनमें से 6,816 ने पहला व्यांत करने की आयु प्राप्त की।
- वर्तमान वर्ष में 5,739 कृत्रिम गर्भाधान किए गए, जिनमें कुल 46.67% की गर्भधारण दर प्राप्त हुई। प्रारंभिक 17 सांड सेटों से लगभग 4,899 बछियों ने अपनी पहली 305-दिन की दुग्ध अवधि पूरी की।
- इन बछियों की पहले 305 दिनों की औसत दूध उत्पादन क्षमता 3,720.51 किलोग्राम दर्ज की गई, जबकि पहली व्यांत की औसत आयु 987.21 दिन रही।
- सांड सेटों के साथ दूध उत्पादन में लगातार वृद्धि देखी गई) प्रथम सेट—1995) में 2,930.4 किलोग्राम से बढ़कर वर्तमान 16वें सेट में 3,720.51 किलोग्राम तक, जो 790.11 किलोग्राम (26.96%) की उल्लेखनीय बढ़ोतरी को दर्शाता है। वहीं, पहली व्यांत की औसत आयु में भी थोड़ी कमी देखी गई पहले सेट में—976.5 दिन से घटकर 16वें सेट में 948.9 दिन, जो 27.6 दिन (2.82%) की कमी को दर्शाता है।

गोविंद बल्लभ पंत कृषि एवं प्रौद्योगिक विश्वविद्यालय, पंतनगर, उत्तराखंड (GBPUA&T):

- कुल 8 सांड सेटों में 169 सांडों का उपयोग करते हुए लगभग 59,200 कृत्रिम गर्भाधान किए गए, जिससे 11,430 मादा संतानों का जन्म हुआ, जिनमें से 2,380 ने पहला व्यांत करने की आयु प्राप्त की।
- वर्तमान वर्ष में लगभग 5,175 गर्भाधान किए गए, जिनमें 53.63% की गर्भधारण दर दर्ज की गई। पहले 8 सांड सेटों से 1,999 बछियों ने अपनी पहली 305-दिन की दुग्ध अवधि पूरी की।

- इन बछियों की पहले 305 दिनों की औसत दूध उत्पादन क्षमता 3,700.59 किलोग्राम रही, जबकि पहली व्यांत की औसत आयु 955.8 दिन रही।
- सांड सेटों के साथ दूध उत्पादन में निरंतर वृद्धि देखी गई) पहले सेट—2010) में 2,494.8 किलोग्राम से बढ़कर वर्तमान 17वें सेट में 3,801.12 किलोग्राम तक, जो 1,306.3 किलोग्राम (52.36%) की उल्लेखनीय बढ़ोतरी को दर्शाता है। इसी तरह, पहली व्यांत की औसत आयु में भी गिरावट देखी गई पहले सेट—में 1,149 दिनों से घटकर वर्तमान सेट में 1,000.5 दिन, जो 148.5 दिन (12.92%) की कमी को दर्शाता है, जो कि सकारात्मक है।

वीर्य उत्पादन एवं वितरण

फ्राइस्वाल सांडों का जनन द्रव्य उत्पादन एवं प्रदर्शन

- कुल 43 सांडों के वीर्य नमूने 50% से अधिक पोस्टथॉ मोटिलिटी के साथ फ्रीज किए गए-, जो कि सीएमयू मानदंडों के अनुसार न्यूनतम वीर्य मात्रा 1.0 मि.(ली., शुक्राणु सांद्रता 500 मिलियन और (.ली.मि/) प्रारंभिक प्रगतिशील गतिशीलता 70%) पर आधारित था। इस प्रक्रिया में कुल 73,144 वीर्य इकाई तैयार की गई, जिनका उपयोग भविष्य के प्रजनन, विभिन्न परियोजनाओं और पशु विकास कार्यक्रमों में किया जाएगा।
- कुल 62 फ्राइस्वाल सांडों से प्राप्त 3,341 इजैक्युलेट्स में औसत वीर्य मात्रा 5.18 ± 0.03 मि.ली., शुक्राणु सांद्रता 1243.31 ± 8.09 मिलियन.ली.मि/, प्रारंभिक गतिशीलता $59.11 \pm 0.23\%$ तथा पोस्ट थॉ मोटिलिटी- $39.56 \pm 0.19\%$ दर्ज की गई।
- फील्ड प्रोजेनी टेस्टिंग परियोजना तथा विभिन्न विकास एजेंसियों, संस्थान, पैरा वेट्स एवं किसानों को-बिक्री हेतु कुल 17,220 वीर्य इकाई संस्थान के वीर्य वितरण केंद्र को उपलब्ध कराई गई।

साहीवाल सांडों का जनन द्रव्य उत्पादन एवं प्रदर्शन

- कुल 6 साहीवाल सांडों से 13,290 वीर्य इकाई फ्रीज की गई। 7 सांडों से प्राप्त 343 इजैक्युलेट्स के आधार पर वीर्य का औसत मात्रा 4.29 ± 0.08 मि.ली., शुक्राणु सांद्रता 1227.58 ± 26.21 मिलियन.ली.मि/, प्रारंभिक गतिशीलता $61.98 \pm 0.61\%$ और पोस्ट थॉ मोटिलिटी- $37.58 \pm 0.66\%$ दर्ज की गई।
- 759 वीर्य इकाई बिक्री और अन्य उपयोग के लिए वीर्य वितरण केंद्र को वितरित की गई।

फ्राइस्वाल सांड वीर्य की गुणवत्ता मूल्यांकन:

- 121 फ्रोजन वीर्य नमूनों की पोस्टथॉ गुणवत्ता में प्रारंभिक प्रगतिशील गतिशीलता- 51.09% पाई गई, जो 60 मिनट पर घटकर 33.09% और 120 मिनट पर 21.57% रह गई। HOST परीक्षण में 44.83% और एक्रोसोम की अखंडता 73.55% दर्ज की गई। वीर्य की औसत शुक्राणु सांद्रता 21.65 मिलियन प्रति स्ट्रॉ रही, जबकि माइक्रोबियल लोड 780.39 CFU/ml पाया गया।
- नवपरिचित 24 सांडों में वीर्य की जीविता अच्छी रही, जहां औसतन 71.53% जीवित शुक्राणु और कुल विकृति दर 19.74% रही; वहीं एक्रोसोम अखंडता 74.16% दर्ज की गई।
- समस्या वाले 7 सांडों में वीर्य की गुणवत्ता अपेक्षाकृत कम रही, जिनमें 58.85% जीवित शुक्राणु और कुल विकृति दर 22.06% पाई गई, विशेषकर सिर और मिडपीस की संरचना में अधिक विकृति देखी गई।-

गौवंशो की आनुवंशिकी एवं प्रजनन क्षमता में वृद्धि

- गौवंशों की फाइब्रोब्लास्ट कोशिकाओं में CD46 जीन को लक्षित करने वाले गाइड RNA को बायोइन्फॉर्मेटिक्स उपकरणों की सहायता से सटीक रूप से डिजाइन किया गया और संश्लेषित किया गया। इन्हें CRISPR/Cas9 आधारित नॉकआउट प्रयोगों में उपयोग कर CD46 जीन की बोवाइन वायरल डायरिया वायरस (BVDV) के प्रति संवेदनशीलता में भूमिका का अध्ययन किया गया, जिससे रोग प्रतिरोधक क्षमता को समझा और सुधारा जा सके।
- फॉलट्रॉपिन) वी-5-दिवसीय रेजीमने साहीवाल गायों में फॉलिक्यूलर विकास (, कॉरपोरा ल्यूटिया का निर्माण और भ्रूण उत्पादन में स्टिमुफोल की तुलना में बेहतर परिणाम दिए। हार्मोनल परीक्षणों में ओव्यूलेशन और ल्यूटल गतिविधि की पुष्टि हुई। साहीवाल नस्ल के लिए 260 मिलीग्राम)10 डोज की खुराक उपयुक्त (पाई गई, जबकि अन्य नस्लों के लिए सर्वश्रेष्ठ सुपरओवुलेटरी प्रतिक्रिया हेतु अनुकूलित MOET प्रोटोकॉल की आवश्यकता रही।
- फ्राइसवाल सांडों पर दो अध्ययन किए गए, जिनमें कैप्टोप्रिल और रेसीक्विमॉड का वीर्य क्रायोप्रीजर्वेशन एवं लिंग अनुपात को प्रभावित करने हेतु मूल्यांकन किया गया। कैप्टोप्रिल)10 nM) और रेसीक्विमॉड)0.4 μ M) ने शुक्राणु गुणवत्ता में सुधार किया और X-शुक्राणुओं को समृद्ध किया, जिसे आणविक मार्करों द्वारा सत्यापित किया गया। दोनों यौगिक वीर्य संरक्षण और महिला संतति प्राथमिकता चयन में प्रभावी और किफायती विकल्प के रूप में आशाजनक पाए गए।
- सोलह फ्राइसवाल सांडों का विभिन्न ऋतुओं में वीर्य गुणवत्ता के आधार पर मूल्यांकन किया गया और उन्हें अच्छी गुणवत्ता)G-I) एवं खराब गुणवत्ता)G-II) श्रेणियों में वर्गीकृत किया गया। G-I सांडों में वीर्य की मात्रा, गतिशीलता, जीवित शुक्राणु प्रतिशत अधिक एवं विकृतियाँ कम पाई गईं, जबकि G-II सांडों में वीर्य गुणवत्ता कम और विकृतियाँ अधिक थीं, जिससे चयनात्मक प्रजनन और उर्वरता प्रबंधन की आवश्यकता स्पष्ट होती है।

पोषण एवं प्रबंधन के माध्यम से गोवंश की उत्पादकता में सुधार

- वाइल्ड गिनी घास (WGG) तीव्र गति से फैलने वाली और अक्सर अनुपयोगी रहने वाली घास है, जिसे चारे के रूप में उपयोग में हाइड्रोजन सायनाइड (HCN) की उपस्थिति के कारण चुनौतीपूर्ण माना जाता है। खनिज मिश्रण (MM), मक्का आटा (MF), गुड़ पाउडर (JP) और लैक्टिक एसिड बैक्टीरिया (LAB) जैसे योजकों के साथ बनाए गए साइलेज में विशेष रूप से T-5 और T-6 उपचारों में बेहतर किण्वन, सुगंध और पोषक तत्वों की उपलब्धता देखी गई।
- WGG को MM, MF, JP और LAB (क्रमशः 0.2g, 0.6g, 0.6g और 1.5×10^6 CFU प्रति 100g ताजा WGG) के साथ इनसाइल करने से साइलेज की गुणवत्ता में सुधार हुआ। T-6 उपचार में सबसे अच्छे परिणाम मिले—pH और अमोनिया नाइट्रोजन कम थे, जबकि लैक्टिक एसिड और LAB की मात्रा अधिक थी। पोषक तत्वों में DM, OM और NDF की कमी तथा CF, ADF और राख की मात्रा में वृद्धि देखी गई।
- वनस्पतियों के मिश्रण से बने आहार पूरक के सेवन से संपूर्ण प्रतिक्रिया समय नियंत्रण समूह (सेकंड) में 47 ± 2.0 से घटकर उपचार समूह में 44 ± 2.0 हो गया। वीर्य गुणवत्ता के प्रमुख मानदंडों जैसे कि इजैक्युलेट वॉल्यूम)0.8% वृद्धि(, शुक्राणु सांद्रता)46%), प्रारंभिक गतिशीलता)7.87%) और पोस्ट थॉ-) मोटिलिटी(PTM) में भी उपचार समूह में सुधार देखा गया।
- गाय के अपशिष्ट से उत्पादित माइक्रोएलगी को चारे के रूप में खिलाकर ओमेगा-3 समृद्ध दूध उत्पादन हेतु एक पायलट परियोजना शुरू की गई। TERI के सहयोग से विकसित माइक्रोएलगी में उच्च प्रोटीन एवं लाभकारी वसीय अम्ल पाए गए। प्रारंभिक परीक्षण के परिणाम उत्साहजनक हैं तथा डेटा विश्लेषण प्रगति पर है।

- फ्राइजवाल सांडों में सोया लेसिथिन के सेवन का वीर्य गुणवत्ता और रक्त वीर्य प्लाज्मा पर प्रभाव आंकने/के लिए अध्ययन किया गया। प्रारंभिक चक्र में मामूली सुधार देखा गया, जबकि दूसरे और तीसरे चक्र में उपचारित समूह में वीर्य आयतन, संकेंद्रण, गतिशीलता और फ्रीज के बाद गतिशीलता में उल्लेखनीय वृद्धि हुई। आगे के परीक्षण प्रगति पर हैं।
- थनैला रोग ग्रसित पशु से प्राप्त दूध में सोमैटिक सेल काउंट, विद्युत चालकता और नमक की मात्रा अधिक पाई गई, जबकि स्वस्थ दूध में पोषक तत्व अधिक पाए गए। इन्फ्रारेड थर्मोग्राफी तकनीक द्वारा सतह के तापमान में वृद्धि के आधार पर मास्टाइटिक क्वार्टर की पहचान प्रभावी ढंग से की गई। प्रभावशाली एंटीबायोटिक्स में जेंटामाइसिन, क्लोरैम्फेनिकॉल, सिप्रोफ्लोक्सासिन और सेफ्ट्राएक्सोन सम्मिलित थे, जबकि कुछ रोगकारक टेट्रासाइक्लिन और स्ट्रेप्टोमाइसिन के प्रति प्रतिरोधी पाए गए।
- 12 औषधीय पौधों का उपयोग कर तीन हर्बोमिनरल फार्मूलेशन-न तैयार किए गए, जिन्हें आवश्यक खनिजों के साथ पूरकित कर, ब्याने के आसपास के संक्रमण काल के दौरान गोवंश को खिलाया गया। इस दौरान-12 गोवंशों से कुल 72 रक्त नमूनों को विश्लेषण हेतु एकत्र किया गया।
- प्रत्येक समूह में 8 गोवंश, आयु एवं भार में समान रखे गए, जिन्हें या तो ठंडक व्यवस्था वाले संशोधित शेड में या हीटस्ट्रेस से प्रभावित पारंपरिक शेड में रखा गया। गोवंश के शारीरिक मानकों- (रेक्टल तापमान, श्वसन दर, हृदय गति और रक्त नमूने को जैव रासायनिक एवं आणविक विश्लेषण के लिए एकत्र किया गया ताकि शेड की परिस्थितियों के प्रभाव का आकलन किया जा सके।

पशुपालन अर्थशास्त्र

- दुग्ध पशु पालन पर व्यय एवं निवेश पैटर्न में जनपदवार भिन्नता पाई गई, जो ₹7546.29 (मुरादाबाद) से ₹14250.77 (गाजियाबाद) तक था। प्रमुख खर्चों में हरा चारा (, सूखा चारा, और केंद्रित चारा शामिल थे, जिनके बाद श्रम व्यय आता है। प्रति पशु लागत ₹279.16 (मुरादाबाद) से ₹427.80 (गाजियाबाद) तक पाई गई, जो गाजियाबाद में अधिक निवेश तीव्रता को दर्शाता है।
- संकर गायों के दूध उत्पादन में लागत और लाभ के विश्लेषण से पता चला कि औसतन दूध उत्पादन लागत ₹43.15/लीटर थी, जो गाजियाबाद में सर्वाधिक ₹47.50 थी। विक्रय मूल्य ₹40.00 (मुरादाबाद) से ₹57.50 (गाजियाबाद) तक था (, औसत ₹49.21 रहा। प्रति लीटर लाभ गाजियाबाद में सर्वाधिक ₹10.00 और मुरादाबाद में न्यूनतम ₹2.82 रहा, जिससे लागत नियंत्रण एवं विक्रय दर पर आधारित लाभप्रदता में अंतर स्पष्ट होता है।
- देशी गायों की औसत दूध उत्पादन लागत ₹43.12/लीटर रही, जबकि विक्रय मूल्य ₹59.67/लीटर था। मेरठ में सर्वाधिक लाभ ₹12.51 रहा, गाजियाबाद में मध्यम लाभ ₹7.50 तथा मुरादाबाद में ₹-2.37 की हानि हुई, जो अधिक उत्पादन लागत और कम विक्रय मूल्य के कारण परिचालन अक्षमता या विपरीत बाजार परिस्थितियों को दर्शाता है।
- संकर गायों का दूध उत्पादन 11.30 किग्रा) देशी गायों (दिन/7.43 किग्रा की तुलना में अधिक (दिन/ था। प्रथम ब्यांत की औसत आयु संकर में 23.99 माह तथा देशी में 41.89 माह रही। थनैला (मास्टाइटिस), एफएमडी जैसे रोगों और प्रजनन विकारों जैसे एनएस्ट्रस व रिपीट ब्रीडिंग की समस्याएं विशेष रूप से बागपत और मेरठ जनपदों में पाई गईं।
- गोबर से तैयार बायोमास ब्रिकेट में 10% गन्ने की खोई मिलाकर ऊष्मा मान बढ़ाया गया। पुष्प अपशिष्ट ने सुखाने की प्रक्रिया को बाधित किया और अनुपयुक्त पाया गया। रासायनिक योजकों से दहन क्षमता, धुआं नियंत्रण और सल्फर अवशोषण में सुधार हुआ। योजकों के उपयोग से ब्रिकेट की ऊष्मा क्षमता 2.5–3 गुना बढ़ी। उपचारित ब्रिकेट में नमी, वाष्पशील तत्व, निश्चित कार्बन, और राख की मात्रा थोड़ी अधिक पाई गई।

- फ़िज़वाल, साहिवाल और थारपारकर नस्लों के बीच दूध की संरचना में अंतर का अध्ययन किया गया। लैक्टोस्कैन विश्लेषण से पता चला कि देशी गायों में वसा-, एसएनएफ, प्रोटीन, लैक्टोज और नमक की मात्रा अधिक थी, जिसमें साहिवाल नस्ल थारपारकर से बेहतर पाई गई। इसके बावजूद, वसा की मात्रा सभी में समान रूप से कम थी, जो पोषण रणनीतियों में संशोधन की आवश्यकता को दर्शाता है। आगे चयापचयी यौगिकों का विश्लेषण प्रस्तावित है। (मेटाबोलाइट्स)
- चार जिलों में किए गए एक व्यापक क्षेत्रीय सर्वेक्षण के तहत दुग्ध किसानों की सामाजिक आर्थिक-स्थिति, दूध उत्पादन लागत तथा देशी और संकर पशुओं से प्राप्त लाभ का आकलन किया गया। परिणामों में पाया गया कि संकर पशुओं की दैनिक दुग्ध उत्पादन क्षमता 8.26 लीटर बनाम 4.86 लीटर, कुल लाभ तथा प्रति लीटर उत्पादन लागत में देशी पशुओं की तुलना में बेहतर थी।
- चारा एवं पशुआहार लागत का सबसे बड़ा हिस्सा था, जिसमें संकर पशुओं के लिए अधिक निवेश की आवश्यकता थी, लेकिन उनसे अधिक लाभ प्राप्त हुआ। संसाधन दक्षता विश्लेषण से स्पष्ट हुआ कि देशी पशुओं में सूखा चारा एवं सांद्र आहार, जबकि संकर पशुओं में केवल सांद्र आहार, दुग्ध उत्पादन को महत्वपूर्ण रूप से प्रभावित करते हैं। निष्कर्ष दर्शाते हैं कि देशी पशुओं की उत्पादकता बढ़ाने हेतु नस्ल सुधार और कृत्रिम गर्भाधान कार्यक्रम आवश्यक हैं।
- प्रयोगात्मक डेयरी इकाई में फ़ाइस्वाल एवं साहीवाल नस्ल की कुल 42 गायें व बछड़े थे। वर्ष के दौरान 10 बछड़ों का जन्म हुआ। इकाई द्वारा कुल 22,425 लीटर दूध का उत्पादन किया गया, जिसकी अनुमानित मूल्य ₹11,21,250 रही। पूरे वर्ष दोनों नस्लों पर अनुसंधान कार्य किए गए।
- विभिन्न पशु आहार नमूनों के विश्लेषण) परीक्षण हेतु परामर्श सेवाएं मेल जनन द्रव्य इकाई/BRU/MGU) और अन्य हितधारकों को प्रदान की गई, और इस अवधि के दौरान कुल 31 आहार नमूनों का निकटतम संघटन (proximate composition) हेतु विश्लेषण किया गया।

विस्तार अनुभाग

- संस्थान ने भाकृअनुप संस्थानों एवं राज्य सरकार द्वारा आयोजित नौ राष्ट्रीय स्तर की प्रदर्शनियों और किसान मेलों में भाग लिया, जहाँ पशुपालन, पोषण एवं पशु स्वास्थ्य से संबंधित अनुसंधान और तकनीकों का प्रदर्शन किया गया। इन आयोजनों में 7,000 से अधिक किसानों, छात्रों एवं हितधारकों ने संस्थान के स्टॉल का अवलोकन किया।
- संस्थान द्वारा विश्व पशु चिकित्सा दिवस, विश्व दुग्ध दिवस एवं स्थापना दिवस जैसे प्रमुख आयोजनों को किसान-विज्ञान संवाद, जागरूकता व्याख्यान एवं इनपुट वितरण कार्यक्रमों के साथ मनाया गया। कृषि एवं जैव प्रौद्योगिकी महाविद्यालयों के 300 से अधिक छात्रों ने प्रयोगशालाओं, वर्मी कम्पोस्टिंग एवं डेयरी प्रथाओं का व्यावहारिक अवलोकन कर ज्ञानवर्धन किया।
- संस्थान में भाकृअनुप के पशु विज्ञान उपमहानिदेशक, ASRB के अध्यक्ष एवं ब्राजील से आए अंतर्राष्ट्रीय प्रतिनिधियों सहित कई प्रमुख गणमान्य व्यक्तियों का स्वागत किया गया। इन दौरों में जीनोमिक चयन, जलवायु अनुकूल पशुधन एवं प्रिसिजन डेयरी फार्मिंग पर सहयोगात्मक अनुसंधान की संभावनाओं पर विचार-विमर्श हुआ। ब्राजीलियाई प्रतिनिधियों ने संयुक्त अनुसंधान में रुचि दिखाई, जिससे संस्थान की वैश्विक भागीदारी और अनुसंधान क्षितिज विस्तृत हुआ।

भाकृअनुप वित्तपोषित योजनाएं:

फार्मर फर्स्ट कार्यक्रम

- फार्मर फर्स्ट कार्यक्रम के अंतर्गत व्यापक विस्तार गतिविधियों में 23 पशु स्वास्थ्य शिविरों (1,230 पशु, 52 दौरे (जिससे 976 किसान व 452 परिवार लाभान्वित हुए), 12 पशुपालन) एकीकृत कृषि प्रणाली/IFS) प्रदर्शन, और किसान दिवस समारोह शामिल रहे। दूध प्रसंस्करण, आम के बागानों में फसल आधारित IFS, तथा वर्मी कम्पोस्टिंग पर प्रशिक्षण से 1,800 से अधिक किसान लाभान्वित हुए। 9 किसानों एवं पैरावेट्स को सम्मानित किया गया।
- सब्जी व दलहन की खेती हेतु 600 किसानों को तकनीकी सहायता प्रदान की गई। एक किसान उत्पादक संगठन (FPO) का गठन किया गया। प्रशिक्षित कृत्रिम गर्भाधान कर्मियों द्वारा 1,400 उच्च गुणवत्ता वाले वीर्य इकाई के माध्यम से 356 गर्भधारण सफलतापूर्वक कराए गए।

कृषि जैव विविधता पर अखिल भारतीय समन्वित अनुसंधान परियोजना (CRP)

- देशी गोवंशीय पशुधन के जैविक संसाधनों के संरक्षण हेतु भाकृअनुप राष्ट्रीय पशु आनुवंशिक संसाधन- (ब्यूरो ICAR-NBAGR) के नेतृत्व में तथा भाकृअनुप) केंद्रीय गो अनुसंधान संस्थान-ICAR-CIRC) की सहभागिता से सोमैटिक कोशिकाओं का क्रायोबैंकिंग किया गया। इस पहल में बट्टी, पुल्लिकुलम, पोंवार तथा खरियार जैसी देशी नस्लों को शामिल किया गया। प्रसंस्करण के दौरान कोशिका हानि के कारण पोंवार को छोड़कर सभी नस्लों की कोशिकाओं का सफलतापूर्वक क्रायोसंरक्षण (Cryopreservation) किया गया।
- बट्टी (42 वायल), पुल्लिकुलम (10 वायल) तथा खरियार (28 वायल नस्लों की जीवित कोशिकाओं का) सफलतापूर्वक क्रायोप्रीज़र्वेशन किया गया। इन नमूनों को बड़े पैमाने पर संरक्षण के लिए विस्तारित किया जा रहा है, जिससे देशी गोवंशीय जैव विविधता को संरक्षित करने के लिए राष्ट्रीय प्रयासों को मजबूती मिल रही है।

स्वच्छता कार्य योजना

- सूक्ष्मजीव आधारित कृषि अपशिष्ट प्रबंधन प्रणाली के अंतर्गत वर्मीकंपोस्टिंग इकाई के उन्नयन हेतु ₹18 लाख की धनराशि स्वीकृत की गई। अतिरिक्त 8 वर्मी बेड का निर्माण किया गया, जिससे 16 टन गोबर अपशिष्ट का प्रबंधन संभव हुआ। पशु फार्म के चारे, पत्तों एवं अन्य बायोमास को शीघ्र खाद में परिवर्तित करने हेतु एक यांत्रिक कंपोस्टर स्थापित किया गया।
- सूखे एवं गोबर अपशिष्ट प्रबंधन की प्रक्रिया को अनुकूलित किया गया, जिसमें यांत्रिक कंपोस्टर से 6-8 घंटे में प्राप्त अपशिष्ट को वर्मी बेड में परतों में डाला गया, जिससे तेज़ी से वर्मीकंपोस्ट तैयार हो सके। वर्तमान में यह इकाई 14 वर्मी बेड के साथ संचालित है, जिसकी मासिक उत्पादन क्षमता लगभग 30 क्विंटल है। इससे लगभग ₹6 लाख की आय हुई, तथा वर्मीकंपोस्ट किसानों, शहरी नागरिकों एवं SCSP/TSP योजनाओं के अंतर्गत विभिन्न गांवों को वितरित किया गया।

केंद्रीय सरकार की विशेष सहायता योजना

अनुसूचित जाति उप-योजना (एससीएसपी)

- किसानों को प्रशिक्षण और इनपुट वितरण के माध्यम से सशक्त किया गया। उत्तर प्रदेश और उत्तराखंड में कुल 13 किसान प्रशिक्षण कार्यक्रम, किसान गोष्ठियाँ एवं इनपुट वितरण शिविर आयोजित किए गए।

1,000 से अधिक अनुसूचित जाति के किसान लाभान्वित हुए, जिन्हें पशु आहार, धान/गेहूं बीज, उपकरण, कृमिनाशक एवं चावल/गेहूं की खेती, पशुपालन व दुग्ध उत्पादन से संबंधित सामग्री वितरित की गई।

- क्षमता निर्माण और मानव संसाधन विकास के उद्देश्य से परामर्श बैठकें, संगोष्ठियाँ एवं राज्य प्रायोजित किसान प्रशिक्षण कार्यक्रम आयोजित किए गए। इनसे स्वच्छ दुग्ध उत्पादन एवं पशुपालन प्रबंधन में तकनीकी दक्षता में वृद्धि हुई। बिहार में एक प्रमुख पशु आरोग्य मेला तथा विभिन्न राज्य स्तरीय कार्यक्रमों के माध्यम से सैकड़ों किसानों को सतत डेयरी पालन एवं पशु स्वास्थ्य देखभाल के प्रति जागरूक किया गया।
- मॉडल गांव एवं कस्टम हायरिंग सेंटर पहल के तहत, मेरठ के पांच गांवों को अनुसूचित जाति उप-योजना (SCSP) के अंतर्गत पशु उत्पादन मॉडल गांवों के रूप में विकसित किया गया। इसमें पशु आहार, स्वास्थ्य सेवाएं, स्वच्छ दुग्ध उत्पादन उपकरण, चारा विकास एवं गोबर के मूल्यवर्धन जैसी लक्षित गतिविधियाँ शामिल रहीं। साथ ही, मेघालय में स्थापित कस्टम हायरिंग सेंटर के माध्यम से स्वयं सहायता समूहों को 390 लघु कृषि उपकरण वितरित किए गए, जिससे कृषि यंत्रीकरण एवं उत्पादकता में वृद्धि हुई।

जनजातीय उप-योजना) टीएसपी (

- जनजातीय उप-योजना (TSP) के तहत बिहार, झारखंड और उत्तराखंड में कुल सात प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनका उद्देश्य अनुसूचित जनजाति परिवारों को पशुपालन प्रबंधन के क्षेत्र में जागरूकता और क्षमता विकास के माध्यम से सशक्त बनाना था। पशु आहार, खनिज मिश्रण, औजार एवं दवाओं जैसे इनपुट 1,150 से अधिक लाभार्थियों को वितरित किए गए ताकि पशु स्वास्थ्य और उत्पादकता में सुधार हो सके।
- इन पहलों ने पशु स्वास्थ्य, संतुलित आहार, और पशु अपशिष्ट के आर्थिक उपयोग पर ज्ञान में वृद्धि की। इसके परिणामस्वरूप लाभार्थियों की पशुपालन पद्धतियों में सुधार हुआ, पशुओं की स्थिति बेहतर हुई और उनकी आर्थिक स्थिति में सकारात्मक परिवर्तन आया, जिससे आजीविका को मजबूती और समग्र जनजातीय कल्याण को बढ़ावा मिला।

पूर्वांतर पर्वतीय क्षेत्र योजना) एनईएचआर (

- एनआरसी मिथुन और एनआरसी याक के सहयोग से वैज्ञानिक पशुपालन, वर्मी कम्पोस्टिंग एवं मिथुन स्वास्थ्य प्रबंधन पर प्रशिक्षण आयोजित किए गए। नगालैंड, अरुणाचल प्रदेश और मणिपुर में कुल छह प्रशिक्षण कार्यक्रमों से 450 से अधिक किसान लाभान्वित हुए, जबकि जागरूकता कार्यक्रमों से लगभग 900 किसानों को लाभ मिला।
- पाँच जागरूकता सह-इनपुट वितरण कार्यक्रम आयोजित किए गए, जिनमें 700 से अधिक किसानों को चारा, पशु स्वास्थ्य सामग्री और कृषि उपकरण वितरित किए गए। अरुणाचल प्रदेश में याक पर केंद्रित कार्यक्रमों के तहत 19.35 टन चारा, दवाएं और उपकरण वितरित किए गए, जिससे ऊंचाई वाले क्षेत्रों में स्थायी पशुपालन और अर्ध-गहन मिथुन पालन को बढ़ावा मिला।

बाह्य वित्तपोषित योजनाएं

पशुपालन एवं डेयरी विभाग) DAHD) प्रायोजित परियोजना

- गायों की सहायक प्रजनन तकनीक (ART) में महत्वपूर्ण प्रगति हुई, जिसमें आईसीएआरएनडीआरआई-, कल्याणी में 48 आईवीएफ भ्रूणों का निर्माण, उनका क्रायोप्रीजर्वेशन और आईसीएआरसीआईआरसी-, मेरठ को स्थानांतरण शामिल है। तीन ट्राइगस इनक्यूबेटर खरीदे गए। साथ ही, थारपारकर और गिर नस्लों के 15 लैंगिक भ्रूणों का ट्रांसफर किया गया, जिनमें से चार गर्भधारण की संभावनाएं दर्शा रही हैं। यह कार्य प्रजनन प्रबंधन और जनन द्रव्य संरक्षण को आगे बढ़ाने में सहायक रहा।
- राष्ट्रीय गोकुल मिशन के तहत वीर्य स्टेशन को सुदृढ़ बनाने का उद्देश्य उन्नत तकनीकों व प्रशिक्षण के माध्यम से वीर्य उत्पादन एवं गुणवत्ता में सुधार करना था। वर्ष 2024-25 में 99,239 वीर्य इकाई का उत्पादन हुआ, जिनमें से 80,504 इकाई वितरित किए गए। गुणवत्ता का मूल्यांकन मोटिलिटी परीक्षणों द्वारा किया गया और आवश्यक सामग्री की आपूर्ति सुनिश्चित की गई, जिससे स्टेशन की क्षमता और कार्यकुशलता में उल्लेखनीय वृद्धि हुई।
- सीएसआईआरसिमैप द्वारा विकसित पौधों के अर्क जैसे- R-AMR-E और R-AMS-E का उपयोग, बुल वीर्य की फ्रीजेबिलिटी बढ़ाने के लिए किया गया। फ्राईस्वाल बुल वीर्य पर चार समूहों में परीक्षण किया गया। सप्लीमेंटेशन से पोस्टथॉ मोटिलिटी-, जीवन शक्ति में सुधार हुआ और ऑक्सीडेटिव तनाव में कमी देखी गई। 1% R-AMS-E और 4% R-AMR-E की सांद्रता पर सबसे बेहतर क्रायोप्रोटेक्टिव प्रभाव दर्ज किए गए।

विज्ञान और प्रौद्योगिकी विभाग) DST) द्वारा प्रायोजित परियोजना

- गौमूत्र से उपचारित धान पुआल चारे के ब्लॉकों की मानकीकरण प्रक्रिया पूरी की गई। विभिन्न उपचारों का पोषण मानों और पाच्यता के आधार पर विश्लेषण किया गया। सूखा पदार्थ (Dry Matter), कूड प्रोटीन, और इन) विट्रो डाई मैटर डाइजेस्टिबिलिटी-IVDMD) अलगअलग उपचारों में भिन्न पाए गए।-
- मानकीकृत चारा ब्लॉकों को बछड़ों को खिलाया गया, और पोषण परीक्षण के दौरान उनके प्रदर्शन के साथसाथ रक्त एवं रुमेन मापदंडों का भी मूल्यांकन किया गया।-

Executive summary

All India Coordinated Research Project on Cattle

Genetic Improvement of Indigenous Cattle Breeds through Progeny Testing – Indigenous Breed Project

- Genetic improvement was accomplished through the selection of elite animals from the Gir, Kankrej, and Sahiwal breeds at designated germplasm units and associated herds.
- These germplasm units are situated at the Cattle Breeding Farm in Junagarh, Gujarat; the Livestock Research Station in Dantiwada, Gujarat; and the National Dairy Research Institute (NDRI) in Karnal, Haryana. The associated herds, including those maintained by farmers in field areas, are supported by various implementing agencies

Gir breed:

- The germplasm unit for Gir cattle at the Cattle Breeding Farm, Junagadh, under Kamdhenu University, Gandhinagar, Gujarat, maintained a herd of 156 animals, while the data recording unit included 252 animals. Among these, 91 breedable females were identified and registered within the germplasm unit.
- Semen was collected from 40 bulls across five sets, leading to the production of 5,975 semen doses. Of these, 3,295 doses were utilized for insemination, and 2,58,145 doses are stored for future use.
- A total of 52 inseminations were carried out, resulting in 19 confirmed pregnancies. Since the project's initiation, 209 daughters have been born.
- At the germplasm unit, the average 305-day milk yield, total lactation yield, peak yield, and lactation length were recorded as 2,163.20 kg, 3,538.60 kg, 11.10 kg, and 563.30 days, respectively. Corresponding figures at the data recording unit were 2,217.5 kg, 3,315.80 kg, 11.40 kg, and 533.80 days.

Kankrej breed:

- The germplasm unit for the Kankrej breed is situated at the Livestock Research Station, Dantiwada, under Kamdhenu University, Gandhinagar, Gujarat. It operates with five data recording units and 13 AI centers, collectively covering 6,200 Kankrej cows belonging to 5,100 farmers across 64 villages.
- The germplasm unit maintained a herd of 58 animals, and 48 Kankrej bulls were introduced in six different sets.
- A total of 9,478 semen doses were produced, out of which 7,649 were used for insemination. Currently, 1,32,930 doses are available for future breeding programs. In total, 1,867 inseminations were conducted, leading to 988 confirmed pregnancies. Since the beginning of the project, 4,926 daughters have been born.
- At the germplasm unit, the average 305-day milk yield, total lactation yield, peak yield, and lactation length were 2,522.78 kg, 2,869.80 kg, 12.10 kg, and 475 days, respectively. At the data recording units, the corresponding figures were 1,696.95 kg, 1,862.24 kg, 8.93 kg, and 312.00 days.

Sahiwal breed:

- The germplasm unit for Sahiwal cattle was established at NDRI, Karnal, while data recording units were located at the Regional Research and Training Centre, Kaljharani, Bathinda; GADVASU, Ludhiana; G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand; and the Livestock Farm of LUVAS, Hisar.
- The total herd strength at the germplasm unit was 455 animals, with 655 breedable females recorded across all units. Additionally, 43 Sahiwal bulls were inducted for progeny testing.
- During the reporting period, 35,449 semen doses were produced, of which 15,088 were used for insemination. A stock of 2,01,578 doses remains available for future use. A total of 829 inseminations were carried out, resulting in 367 confirmed pregnancies. Since the project's start, 1,760 daughters have been born.
- At the germplasm unit, the Sahiwal breed recorded an average 305-day milk yield of 2,201.35 kg, total lactation yield of 2,072.51 kg, peak yield of 10.16 kg, and an average lactation length of 245.55 days.
- Among the data recording units, Pantnagar reported the highest 305-day average milk yield at 2,017.93 kg, while Hisar had the lowest at 1,684.43 kg. The highest total milk

yield was observed at Ludhiana (2,209.35 kg), and the lowest again at Hisar (1,684.43 kg). Lactation lengths recorded were 356.88 days at Ludhiana, 234.00 days at Hisar, and 300.09 days at Pantnagar.

Genetic Improvement of Crossbred Cattle Under Field Conditions- Field Progeny Testing Project (FPT)

The Field Progeny Testing program was implemented in four units across diverse agro-climatic regions of the country: GADVASU in Ludhiana, Punjab; KVASU in Thrissur, Kerala; BAIF in Pune, Maharashtra; and GBPUAT in Pantnagar, Uttarakhand.

Kerala Veterinary and Animal Sciences University Thrissur, Kerala, (KVASU)

- Around 363 bulls were introduced across 18 sets, resulting in 1,60,284 artificial inseminations, which produced 13,921 daughters. Of these, 3,917 reached the age of first calving.
- A total of 5,004 inseminations were performed with a conception rate of 47.98%. The daughters recorded an average first lactation yield of 3,322.07 kg over 305 days, with an average age at first calving being 990.79 days. From the initial 17 bull sets, 3,917 daughters completed their first 305-day lactation.
- There was a consistent rise in lactation yield across successive bull sets from 1,958.4 kg in the first set (1992) to 3,322.07 kg in the 14th set reflecting a substantial increase of 1,363.67 kg (69.6%). Additionally, the average age at first calving declined from 1,136.4 days in daughters of the first bull set (1992) to 990.79 days in those of the 17th set, indicating a notable reduction of 145.6 days (12.81%).

Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana, Punjab (GADVASU)

- Over 18 bull sets, approximately 382 bulls were introduced, leading to 1,82,381 artificial inseminations and the birth of 26,880 daughters, out of which 8,960 reached the age of first calving.
- A total of 4,864 inseminations were carried out, achieving a conception rate of 48.20%. From the first 17 bull sets, around 7,113 daughters completed their first lactation with a 305-day yield.
- The average milk yield during the first 305-day lactation was 3,935.8 kg, and the average age at first calving was 1,021.56 days.
- A steady increase in milk yield per lactation was observed across bull sets, rising from 2,697.8 kg in the 1st set (1995) to 3,935.8 kg in the 16th set (2023), reflecting a significant increase of 1,238.0 kg (45.88%). Conversely, the age at first calving showed a downward trend, declining from 1,192 days in the first set (1995) to 1,021.56 days in the 16th set, marking a notable reduction of 170.4 days (14.29%).

BAIF Development Research Foundation, Central Research Station, Uruli-Kanchan, Pune

- A total of 1,56,569 artificial inseminations were conducted using 359 bulls across 17 sets, leading to the birth of 19,829 female progenies, of which 6,816 reached the age of first calving.
- In the current year, 5,739 artificial inseminations were carried out, achieving an overall conception rate of 46.67%. From the first 17 bull sets, approximately 4,899 daughters completed their first 305-day lactation.

- The average milk yield of these daughters during their first 305-day lactation was recorded at 3,720.51 kg, with an average age at first calving of 987.21 days.
- A steady increase in milk yield per lactation was observed across bull sets, rising from 2,930.4 kg in the 1st set (1995) to 3,720.51 kg in the current 16th set, showing a notable increase of 790.11 kg (26.96%). A marginal decline in age at first calving was also noted from 976.5 days in the 1st set to 948.9 days in the current 16th set representing a reduction of 27.6 days (2.82%).

GB Pant University of Agriculture & Technology, Pantnagar, Uttarakhand (GBPUA&T)

- A total of approximately 59,200 artificial inseminations were carried out using 169 bulls across 8 sets, leading to the birth of 11,430 female progenies, of which 2,380 reached the age of first calving.
- During the current year, around 5,175 inseminations were conducted, achieving a conception rate of 53.63%. From the first 8 bull sets, 1,999 daughters completed their first lactation with a recorded 305-day milk yield.
- These daughters recorded an average milk yield of 3,700.59 kg in their first 305-day lactation, with an average age at first calving of 955.8 days.
- A consistent upward trend in milk yield per lactation was observed across successive bull sets from 2,494.8 kg in the 1st set (2010) to 3,801.12 kg in the current 16th set indicating a significant increase of 1,306.3 kg (52.36%). Similarly, the age at first calving showed a decreasing trend, dropping from 1,149 days in the 1st set to 1,000.5 days in the latest set, marking a reduction of 148.5 days (12.92%).

Semen Production and Distribution

Germplasm production and performance of Frieswal bulls

- Semen samples from 43 bulls were frozen with more than 50% post-thaw motility as per CMU criteria of minimum semen volume (1.0 ml), sperm concentration (500 million/ml) and initial progressive motility (70%) and a total of 73144 semen doses were produced for future breeding/ use in different projects/ cattle developmental programmes etc.
- The overall average semen volume (ml), sperm concentration (million/ml), initial progressive motility (%) and post thaw motility (%) were 5.18 ± 0.03 , 1243.31 ± 8.09 , 59.11 ± 0.23 and 39.56 ± 0.19 , respectively in 3341 ejaculates collected from 62 Frieswal bulls.
- A total of 17220 frozen semen doses for Field Progeny Testing Project and sale to various developmental agencies, institute, para-vets and farmers for cattle improvement were made available to semen distribution centre of the institute.

Germplasm production and performance of Sahiwal bulls

- A total of 13290 semen doses were frozen from 6 bulls. The overall average semen volume (ml), sperm concentration (million/ml), initial motility (%) and post thaw motility (%) were 4.29 ± 0.08 , 1227.58 ± 26.21 , 61.98 ± 0.61 and 37.58 ± 0.66 , respectively in 343 ejaculates collected from 7 Sahiwal bulls.
- A total of 759 semen doses were disbursed to semen distribution centre for sale and for other purpose.

Quality assessment of Frieswal bull semen:

- Post-thaw semen quality of 121 frozen samples showed a progressive motility of 51.09% at 0 minutes, decreasing to 33.09% at 60 minutes and 21.57% at 120 minutes; HOST and acrosome integrity were 44.83% and 73.55%, respectively, with sperm concentration averaging 21.65 million/straw and microbial load at 780.39 CFU/ml.
- Newly introduced bulls (n=24) showed good semen viability, with 71.53% live sperm and a total abnormality rate of 19.74%; acrosome integrity averaged 74.16%.
- Problem bulls (n=7) had lower semen quality, with 58.85% live sperm and a higher total abnormality rate of 22.06%, especially in head and mid-piece morphology.

Augmentation of Breeding and Reproductive Efficiency

- Guide RNAs targeting the CD46 gene in cattle fibroblasts were precisely designed using bioinformatics tools and synthesized. These were employed in CRISPR/Cas9-mediated knockout experiments to explore the role of CD46 in cattle's susceptibility to bovine viral diarrhoea virus (BVDV), aiming to understand and potentially improve disease resistance.
- Folltropin-V (5-day regimen) led to superior follicular development, corpora lutea formation, and embryo yield in Sahiwal cows compared to Stimufol. Hormonal peaks indicated ovulation and luteal activity. The optimal dose for Sahiwal was 260 mg (10 doses), while other breeds required tailored MOET protocols for best super ovulatory response.
- Two studies on Frieswal bulls evaluated Captopril and Resiquimod for semen cryopreservation and sex ratio skewing. Captopril (10 nM) and Resiquimod (0.4 μ M) improved sperm quality and enriched X-sperm, confirmed by molecular markers. Both agents showed promise for enhancing semen preservation and female-biased sex selection in a cost-effective manner.
- Sixteen Frieswal bulls were evaluated for semen quality across seasons and categorized as good (G-I) or poor (G-II). G-I bulls showed higher semen volume, motility, live sperm percentage, and fewer abnormalities, while G-II bulls had reduced quality and higher defects, indicating the need for selective breeding and fertility management.

Improvement of cattle productivity through Nutrition and Management

- Wild guinea grass (WGG), though fast-spreading and often unused, poses a challenge as fodder due to its HCN content. Silage made using additives like mineral mixture (MM), maize flour (MF), jaggery powder (JP), and lactic acid bacteria (LAB) showed improved fermentation, aroma, and nutrient retention, especially in treatments T-5 and T-6.
- Ensiling WGG with MM, MF, JP, and LAB (at 0.2g, 0.6g, 0.6g, and 1.5×10^6 CFU/100g fresh WGG) enhanced silage quality. T-6 showed the best results with lower pH, ammonia nitrogen, and higher lactic acid and LAB counts. Nutrient shifts included decreased DM, OM, and NDF but increased CF, ADF, and ash.

- Dietary supplementation of mixture of botanicals, overall reaction time (sec) was improved from 47 ± 2.0 in control to 44 ± 2.0 in treatment group. Important semen quality parameters viz., ejaculate volume (ml) @ 0.8%, sperm concentration ($\times 10^6/\text{ml}$) @ 46%, initial motility @ 7.87% and PTM (%) were also improved on treatment group.
- A pilot project was launched to produce Omega-3 enriched milk by feeding cattle with microalgae grown on cattle effluents. In collaboration with TERI, the algae showed high protein and beneficial fatty acids, and initial trial results are promising, with data analysis underway.
- Study conducted to assess soy lecithin's effect on semen quality and blood/semenal plasma in Frieswal bulls showed only slight improvements in initial cycle, while significant gains in semen volume, concentration, motility, and post-thaw motility were observed in the 2nd and 3rd cycles in the treated group. Further trials are ongoing.
- Milk from animals with mastitis showed higher somatic cell counts, conductivity, and salt content, while healthy milk had more nutrients. Infrared thermography effectively identified mastitic quarters by elevated surface temperatures. Effective antibiotics included gentamicin, chloramphenicol, ciprofloxacin, and ceftriaxone, while some pathogens showed resistance to tetracycline and streptomycin.
- Three herbo-mineral formulations using 12 medicinal plants were prepared and supplemented with essential minerals. These were fed to animals during the transitional period around calving. Seventy-two blood samples from 12 animals were collected for analysis.
- Eight animals per group, uniform in age and weight, were housed in either a modified shed with cooling systems or a conventional heat-stressed shed. Physiological parameters (rectal temperature, respiration, heart rate) and blood samples were collected for biochemical and molecular analyses to assess the effects of shed conditions.

Economics of Cattle Husbandry

- Dairy herd expenditure & investment patterns showed districts wise variation. ranging from ₹7546.29 in Moradabad to ₹14250.77 in Ghaziabad. The major expenses included green fodder, dry fodder, and concentrate, followed by labor. Per animal cost ranged from ₹279.16 in Moradabad to ₹427.80 in Ghaziabad, indicating higher investment intensity in Ghaziabad.
- Cost and returns in crossbred cow milk production revealed average milk production cost per liter of ₹43.15 in surveyed district, with Ghaziabad being highest at ₹47.50. Sale price ranged from ₹40.00 (Moradabad) to ₹57.50 (Ghaziabad), averaging ₹49.21. Profit per liter varied by district, highest in Ghaziabad (₹10.00) and lowest in Moradabad (₹2.82), highlighting profitability differences based on cost control and sale rates.
- Indigenous cows had an average milk production cost of ₹43.12/litre and a sale price of ₹59.67/litre. Meerut had the highest profit (₹12.51), Ghaziabad showed moderate profit (₹7.50), while Moradabad incurred losses (₹-2.37) due to higher production cost

and lower sale prices, indicating operational inefficiency or unfavorable market conditions.

- Crossbreds yielded more milk (11.30 kg/day) than indigenous cows (7.43 kg/day). Age at first calving was lower in crossbreds (23.99 months) than indigenous (41.89 months). Diseases like mastitis and FMD were prevalent; reproductive disorders such as anestrus and repeat breeding were also significant, especially in Baghpat and Meerut districts.
- Biomass briquettes from dung were optimized using 10% sugarcane bagasse to enhance calorific value. Flower waste hindered drying and was unsuitable. Chemical additives improved combustion, reduced smoke, and desulfurized emissions. Additives increased calorific value 2.5–3 times. Treated briquettes showed slightly higher moisture, volatile matter, fixed carbon, and ash content.
- The differences in milk composition among Frieswal, Sahiwal, and Tharparkar breeds was studied. Lacto-scan analysis showed indigenous cattle had higher fat, SNF, protein, lactose, and salt levels, with Sahiwal outperforming Tharparkar. Despite this, fat content was uniformly low, suggesting a need to revise feeding strategies. Further metabolite analysis is planned.
- A comprehensive field survey across four districts assessed dairy farmers' socio-economic status, milk production costs, and returns for indigenous and crossbred cattle. Results showed crossbred cattle had higher daily milk yields (8.26L vs 4.86L), better gross returns, and lower per-litre production costs compared to indigenous breeds.
- Feed and fodder formed the largest cost component, with crossbred cattle requiring more input but yielding better returns. Resource efficiency analysis revealed dry fodder and concentrate significantly impacted milk production in indigenous cattle, while concentrate alone influenced crossbreeds. The findings support breed improvement and AI programs to boost indigenous cattle productivity.
- The herd at the experimental dairy unit was comprised of 42 Frieswal and Sahiwal cows and calves. Ten calves were born during the year. The unit produced 22,425 litres of milk worth ₹11,21,250. Research experiments were conducted on both cow breeds throughout the year.
- Consultancy services for the analysis/testing of various animal feed samples were rendered to Male Germplasm Unit (BRU/MGU) and other stakeholders, and during the period a total of 31 feed samples were analyzed for proximate composition.

Extension Section

- Institute participated in nine national-level exhibitions and Kisan Melas organized by ICAR institutes and state bodies, showcasing research and technologies. Over 7,000 farmers, students, and stakeholders visited the institute's stall, gaining exposure to innovations in cattle breeding, nutrition, and animal health technologies.
- The institute celebrated major events like World Veterinary Day, World Milk Day, and Foundation Day with farmer-scientist interactions, awareness lectures, and input distribution. More than 300 students from agricultural and biotechnology colleges

visited ICAR-CIRC for educational exposure to labs, vermicomposting, and dairy practices, enriching their practical knowledge.

- The institute hosted high-profile dignitaries including DDG (Animal Science), ASRB Chairman, and foreign delegates from Brazil. These visits led to discussions on collaborative research in genomic selection, climate-resilient cattle, and precision farming. Brazilian officials expressed interest in joint R&D efforts, strengthening ICAR-CIRC's global partnerships and research scope.

ICAR Funded Schemes: **Farmer First Programme**

- Under the programme, extensive outreach included 23 Animal Health Camps (1,230 animals), 52 visits (benefiting 976 farmers, 452 families), 12 livestock/IFS demos, and Kisan Diwas celebrations. Training on milk processing, IFS with crops in mango orchards, and vermicomposting benefited over 1,800 farmers. Nine farmers and para-vets were felicitated.
- Technical support reached 600 farmers for vegetable and pulse cultivation. A Farmer Producer Organization was formed, 1,400 quality semen doses led to 356 pregnancies via trained AI workers.

CRP on Agrobiodiversity

- The cryobanking of somatic cells from indigenous breeds of cattle led by ICAR-NBAGR with ICAR-CIRC as a collaborator aimed to conserve Indigenous cattle genetic resources. Cryobanking efforts were focused on breeds like Badri, Pullikulam, Ponwar, and Khariar, with successful cryopreservation achieved for all except Ponwar due to cell loss during processing.
- Viable cells were cryopreserved for Badri (42 vials), Pullikulam (10 vials), and Khariar (28 vials). These samples are being expanded for large-scale conservation, reinforcing national efforts to safeguard Indigenous cattle biodiversity.

Swachta Action Plan

- Under the microbial-based agricultural waste management system, ₹18 lakhs was sanctioned to upgrade the vermicomposting unit. Eight additional vermi beds were constructed to manage 16 tonnes of dung waste. A mechanical composter was installed to process feed, fodder, leaves, and biomass for rapid compost conversion.
- The process was optimized for both dry and dung waste, with compost output layered into vermi beds for faster decomposition. The enhanced unit now operates with 14 beds, producing around 30 quintals of vermicompost monthly, generating ₹6 lakhs in revenue through sales to farmers, urban households, and SCSP/TSP village beneficiaries.

Special Assistance Programme of Central Government

Scheduled Caste Sub Plan (SCSP)

- Farmers were empowered through trainings and input distribution and a series of 13 farmer training programmes, Kisan Goshthis, and input distribution camps were conducted across Uttar Pradesh and Uttarakhand. Over 1,000 Scheduled Caste farmers benefited from inputs such as cattle feed, paddy/wheat seeds, tools, dewormers, and equipment promoting rice/wheat cultivation, livestock care, and milk production.
- Aiming capacity building and human resource development events such as consultative meetings, seminars, and state-sponsored farmer trainings were held, enhancing technical skills in clean milk production and livestock management. A major Pashu Aarogya Mela in Bihar and multiple in-state programmes engaged hundreds of farmers, focusing on sustainable dairy farming and animal healthcare under SCSP.
- Under model villages & custom hiring centre initiatives, five villages in Meerut were transformed into livestock production model villages under SCSP through targeted interventions like cattle feed, healthcare, clean milk tools, fodder development, and dung value-addition. Additionally, a Custom Hiring Centre in Meghalaya supplied 390 minor implements to SHGs, enhancing agricultural mechanization and productivity.

Tribal Sub Plan (TSP)

- Under the Tribal Sub-Plan (TSP), seven training programs were conducted across Bihar, Jharkhand, and Uttarakhand to empower Scheduled Tribe families through awareness and capacity building in livestock management. Inputs like cattle feed, mineral mixtures, tools, and medicines were distributed to over 1,150 beneficiaries to support animal health and productivity.
- These initiatives enhanced knowledge on animal health, balanced diets, and the use of animal waste for income generation. As a result, beneficiaries experienced improved livestock practices, better animal well-being, and a positive shift in their economic condition, contributing to sustainable livelihoods and overall tribal welfare.

North Eastern Hills Region (NEHR)

- In collaboration with NRC Mithun and NRC Yak, organized training on scientific animal husbandry, vermicomposting, and Mithun health practices. Over 450 farmers benefited from six training programmes, and around 900 from awareness activities across Nagaland, Arunachal Pradesh, and Manipur, enhancing livestock productivity and rural livelihoods.
- Five awareness-cum-input distribution programmes were held, providing over 700 farmers with feed, health aids, and farm tools. Yak-specific programmes in Arunachal Pradesh distributed 19.35 tonnes of feed, medicines, and equipment to 900 tribal farmers, strengthening sustainable practices in highland livestock rearing and supporting semi-intensive Mithun farming.

Externally Funded Schemes

DAHD Sponsored Project

- Significant progress in cattle ART included production of 48 IVF embryos at ICAR-NDRI, Kalyani, with cryopreservation and transfer to ICAR-CIRC, Meerut. Three Trigas incubators were procured. Additionally, 15 sexed embryos of Tharparkar and Gir cattle

were transferred, with four recipients showing potential conception, advancing reproductive management and germplasm conservation.

- Strengthening of semen station under Rashtriya Gokul Mission aimed to enhance semen production and quality via advanced strategies and training. In 2024–25, 99,239 doses were produced, with 80,504 sold. Quality was ensured through motility assessments and procurement of essential supplies, significantly boosting station efficiency and capacity.
- The plant extracts coded by CSIR-CIMAP viz: R_AMR_E and R-AMS-E were evaluated as additives to enhance bull sperm freezability. Using Frieswal bull semen, four groups were tested. Supplementation improved post-thaw motility, viability, and reduced oxidative stress. Optimal results were seen with 1% R-AMS-E and 4% R_AMR_E, showing significant cryoprotective effects.

DST Sponsored Project

- Preparation of cow urine-treated paddy straw fodder blocks was standardized. Various treatments were analyzed for nutritional content and digestibility. Dry matter, crude protein, and IVDMD varied across treatments. Standardized blocks were fed to calves, and their performance, along with blood and rumen parameters, was evaluated during a feeding trial.

STAFF POSITION (2024)

S. No	Post	Sanctioned	In Position	Vacant
1.	Director	01	01	00
2.	HoD	03	03	00
3.	Principal Scientist	00	08*	-08
4.	Sr. Scientist	06	01	05
5.	Scientist	24	04	20
	Total	34	17	17
B.	TECHNICAL			
1.	T-6(Sr. Technical Officer)	01	00	01
2.	T-3 (Sr. Technical Asstt.)	02	00	02
3.	T-1(Technician)	05	05	00
	Total	08	05	03
C.	ADMINISTRATIVE			
1.	Senior Administrative Officer	00	01	-01
2.	Administrative Officer	01	00	01
3.	Fin. & Acct Officer	01	01	00
4.	Asstt. Adm. Officer	02	02	00
5.	Private Secretary	01	02	-01
6.	Assistant	09	04	05
7.	Personal Assistant	02	01	01
8.	Steno. Gr. III	00	00	00
9.	Upper Divisional Clerk	02	00	02
10.	Lower Divisional Clerk	02	00	02
	Total	20	11	09
D.	SUPPORTING	09	07	02
	Grand Total	71	40	31

*These selected PS will remain there till their retirement/transfer/promotion, as the case\ may be.

FINANCIAL STATEMENT

ICAR-CENTRAL INSTITUTE FOR RESEARCH ON CATTLE, MEERUT

Budget Information & Revenue Receipt for April,2024to March,2025 for ICAR Schemes

ICAR-Central Institute for Research on Cattle, Meerut (Main Scheme)

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital	250425000.00	250425000.00
Grant in Aid-Salaries	96493000.00	96492893.00
Grant in Aid- General		
(i)Pension & Retirement Benefits	21829000.00	21828990.00
(ii)Other Contingency Expenditure	54300000.00	54300000.00
Total	423047000.00	423046883.00
SCSP Expenditure	8000000.00	7995633.00
NEH Expenditure	3800000.00	3800000.00
TSP Expenditure	3500000.00	3500000.00
Institute Corpus Fund	6087780.00	2429777.00
Grand Total	444434780.00	440772293.00
Revenue Generation		10248811.00

AICRP on Cattle Scheme

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital	2360000.00	2360000.00
Grant in Aid-Salaries	15650000.00	15650000.00
Grant in Aid- General (Other Contingency Expenditure)	64000000.00	64000000.00
SCSP Expenditure	4600000.00	4600000.00
TSP Expenditure	2000000.00	2000000.00
Total	88610000.00	88610000.00

ITMU Project (ICAR HQ)

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital		
Grant in Aid- General (Operation Cost)	487000.00	486931.00
Total	487000.00	486931.00

Farmer's First Programme (FFP), ATARI, Zone-IV, Kanpur)

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital		
Grant in Aid- General (Operation Cost)	1040000.00	1039799.00
Total	1040000.00	1039799.00

CRP on Agrobiodiversity (ICAR-NBPGR, Karnal)

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital		
Grant in Aid- General (Operation Cost)	200000.00	198569.00
Total	200000.00	198569.00

Swatchhta Action Plan (ICAR-HQ, New Delhi)

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital	915000.00	915000.00
Grant in Aid- General (Operation Cost)	885000.00	883636.00
Total	1800000.00	1798636.00

DAHDF Project

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital	63159370.00	5066990.00
Grant in Aid- General (Operation Cost)		
Total	63159370.00	5066990.00

DST- Project

Head	Budget (Rs) RE (2024-25)	Expenditure (Rs) w.e.f. 01.04.2024 to 31.03.2025
Grant in Aid-Capital	336001.00	0.00
Grant in Aid- General (Operation Cost)	1560328.00	895173.00
Total	1896329.00	895173.00

RESEARCH ACHIEVEMENTS

(I) All INDIA COORDINATED RESEARCH PROJECT (AICRP) ON CATTLE

A. CONSERVATION AND GENETIC IMPROVEMENT OF INDIGENOUS CATTLE BREEDS – INDIGENOUS BREEDS PROJECT (IBP)

Genetic studies on performance of important indigenous breeds of cattle and their improvement through selection

Under the project, three important indigenous cattle breeds viz., Gir, Kankrej and Sahiwal are covered for their improvement. The project is being implemented in the home tract of the breed in collaboration with various State Veterinary / Agricultural Universities, ICAR institutes, NGOs and Gaushalas. The technical programme of the project envisages the establishment of germplasm (GP) and data recording units (DR) for each breed by registering the animals maintained under farm and field conditions, respectively. The young bulls born out of the nominated mating of elite cows at the germplasm centre are progeny tested using animal and farm facilities existing at the Data Recording Units/ associated herds.

As per the technical programme of the project, for each breed of cattle about 150-200 elite breedable females are made available at the GP unit and about 750 breedable females are identified at 5 or more DR units (herds). The elite females in the GP unit are mated with the genetically superior proven bulls of the breed for the production of superior young bulls. The young bulls born out of nominated mating in the germplasm unit are utilized for breeding the females registered in the DR units and around 60 to 70 females are mated by one young bull so as to get the first lactation milk production records of at least 20 daughters per bull. The information on growth, reproduction, milk production and survivability are recorded for performance evaluation, selection and genetic improvement of recommended indigenous cattle breeds.

A) Gir Breed

The GP unit of Gir cattle is located at Cattle Breeding Farm, Junagadh of Kamdhenu University Gandhinagar, Gujarat. The DR units of the breed are located in 10 farmer herds and 03 associated herds and a total of 18721 breedable females are identified and registered so far under the project.

Herd Strength

The herd strength of GP unit as on 31st December 2024 was 156 animals involving 105 females and 51 males. The numbers of female and male calves born during the year 2024 were 8 and 7, respectively. At the end of the year, the number of breedable females aged above 2.5 years was 83 which included 37 heifers, 19 milch and 27 dry cows. During the year, the GP unit maintained 21 young bulls of above 2 years of age.

The herd strength of the DR unit at CBF, Junagadh as on 31st December 2024 maintained 252 animals consisting of 187 female and 65 male animals. A total of 28 normal calvings resulting in 11 female and 17 male calves occurred during the year. The unit maintained 109 breedable females aged above 2.5 years and 52 young bulls above one year of age.

Bulls inducted and frozen semen doses produced

A total of 40 bulls in five sets (six in first set, nine in second set, nine in third set, nine in fourth set and seven in fifth set) have been put under semen collection. The balance of semen doses for future breeding as on 31st December 2024 since inception was 258145 (18762 of first set, 73128 of second set, 77830 of third set, 58885 of fourth set and 29540 of fifth set). During the year 2024, a total of 5975 semen doses were produced from the fourth (565) and fifth (5410) set of Gir bulls. A total of 3295 doses were utilized for insemination (110 of second, 185 of third, 495 of fourth and 2505 of fifth set (Table-1).

Insemination carried out, conception rate and daughters born

The details of insemination carried out, conception and daughters born are presented in Table-2. During the year 2024, a total of 52 inseminations were carried out and 19 pregnancies were confirmed resulting to an overall conception rate of 36.54 per cent which was lower than the overall conception rate of 49.52 per cent since inception of the project. The total number of inseminations carried out since inception for five sets was 832 consisting of 186 for first, 130 for second, 323 for third, 156 for fourth and 37 for fifth set of bulls. During the year 2024, a total of 8 daughters were produced which resulted in to a total of 209 daughters since inception of the project.

Set wise performance

A total of 40 bulls in five sets (6+9+9+9+7 bulls) have been inducted so far in the program. The total number of semen doses frozen since inception was 347838 (40133, 99556, 99149, 75315 and 33685 for the first five sets, respectively) out of which 89693 (21371, 26428, 21319, 16430 and 4145 for the first five sets, respectively) were utilized resulting to a storage balance of 258145 frozen semen doses. The cows covered for insemination in different sets were 38738 comprising of 12289 in first set, 8341 in second, 6760 in third, 8489 in fourth and 2859 in fifth set. A total of 8018 daughters have so far been produced from different sets (3149, 1648, 1173, 1780 and 268, respectively). A total of 1350 daughters reached AFC (540, 407, 291 and 112 of first four sets of bulls, respectively) of which 971 daughters (372, 384, 164 and 51 of first four sets of bulls, respectively) completed their first lactation.

Body weights

The averages for weight at birth, 3, 6, 12 months, maturity and calving of female animals were 20.50, 42.80, 93.80, 139.70, 280.10 and 336.30 kg, respectively. The average weights at birth, 3, 6, 12 months and maturity of male animals were 22.60, 44.70, 100.60, 147.30 and 298.30 kg, respectively.

Productive and Reproductive performance

The details of productive and reproductive performance of Gir cattle maintained under GP and DR unit of CBF, Junagadh are as follows:

Germplasm unit

The average first lactation 305-days milk yield, first lactation total milk yield and first peak yield were 2163.20 ± 251.00 , 3538.60 ± 697.00 and 11.10 ± 1.20 kg, respectively. The average first lactation length was 563.30 ± 60.80 days. The overall averages for age at first calving, first service period, first dry period and calving interval were 1632.20 days, 265.00, 152.00 and 552.00 days, respectively. The wet and herd averages were 7.20 and 3.20 kg, respectively.

Data recording unit

The average first lactation 305-days milk yield, first lactation total milk yield and peak yield were 2217.50 ± 81.10 , 3315.80 ± 382.60 and 11.40 ± 0.40 kg, respectively. The average first lactation length was 533.80 ± 70.50 days. The average age at first calving, first service period, first dry period and first calving interval were 1621.70 ± 22.20 , 200.30 ± 35.40 , 69.70 ± 42.40 and 489.30 ± 34.50 days, respectively. The wet and herd averages were 7.05 and 3.77 kg, respectively.

Other activities

During the reporting period, 38 registered scheduled caste farmers in the operational area were distributed with the kit consisting of mineral mixture, de-wormer, calcium supplement and milk can of 5 litre capacity. In addition, the farmers were also enlightened on the scientific information regarding dairy husbandry, feeding of dairy animals and importance of Gir cattle. Meeting of AI workers were frequently conducted to review the progress of the project and necessary suggestions were given to improve the efficiency of the implementation of the project.

B) Kankrej Breed

The GP unit of Kankrej cattle is located at Livestock Research Station, Dantiwada of Kamdhenu University Gandhinagar, Gujarat while 5 DR units with 13 AI centres covering 6200 Kankrej cows of 5100 farmers belonging to 64 villages in the native tract of Kankrej breed are included under the program.

Herd Strength

The herd strength of Kankrej animals as on 31st December 2024 was 58 (17 males and 41 females) in GP unit and 494 (101 males and 393 females) in DR unit. The total number of breedable females above 2.5 years in DR unit was 306 and the number of animals in milking was 106. During 2024, a total of 726 calves born of which 363 were females and 363 were males. As on 31st December, 2024, the GP unit maintained 41 elite cows and 17 breeding bulls and the DR unit maintained 193 elite cows, 24 young bulls and 18 breeding bulls.

Bulls inducted and frozen semen doses produced

A total of 48 Kankrej bulls in six sets have been inducted so far. During the year, 9478 frozen semen doses were produced from 8 bulls of fifth and 1 bull of sixth set with a total of 7649 doses being utilized for insemination. Since inception of the project, a total of 226858 semen doses were produced, of which 91148 were utilized and 2780 doses were discarded resulting to a balance of 132930 doses of frozen semen consisting of 806 of first set, 44337 of second set, 29472 of third set, 42966 of fourth set and 15349 of fifth set of bulls for future breeding.

Insemination carried out, conception rate and daughters born

During the reporting period, 1867 animals were inseminated, 988 animals were confirmed for pregnancy and 347 daughters born. The conception rate during the year 2024 was 52.92 per cent against overall conception rate of 47.78 per cent since inception of the project. The total number of daughters produced since inception of the project was 4926 consisting of 407, 1257, 1062, 1413 and 787, respectively for the different five sets of bulls.

Set wise performance

A total of 48 bulls in six sets (8+9+9+9+8+5 bulls) have been inducted so far in the program. The total number of semen doses frozen was 226858 (8000, 65119, 45412, 69109, 34638 and 4580 for the first six sets, respectively) out of which 91148 (7194, 20782, 15540, 24963, 20917 and 1752) were utilized for insemination and 2780 doses were discarded due to poor quality resulting to a storage balance of 132930 frozen semen doses.

The cows covered for insemination in different sets were 18005 comprising of 3000 in first set, 3500 in second, 3905 in third, 4100 in fourth and 3500 in fifth set. A total of 4926 daughters have so far been produced from first five sets (407, 1257, 1062, 1413 and 787, respectively). A total of 1092 daughters reached AFC (151, 400, 302 and 239 of first four sets of bulls, respectively) of which 1049 daughters (131, 370, 288 and 250 of first four sets of bulls, respectively) completed their first lactation.

Productive and Reproductive performance

The details of productive and reproductive performance of Kankrej cattle maintained under GP and DR unit of LRS, Sardarkrushinagar are as follows:

Germplasm unit

The average first lactation 305-days milk yield, first lactation total milk yield and first peak yield of Kankrej cows maintained in the GP units were 2522.78 ± 173.58 , 2869.80 ± 173.58 and 12.10 ± 0.70 kg, respectively. The average first lactation length was 475.00 ± 127.00 days. The overall averages for age at first calving, first service period, first dry period and first calving interval were 1414.00 ± 123.00 , 360.50 ± 94.50 , 213 and 653.00 ± 92.00 days, respectively. The wet and herd averages were 8.89 and 4.68 kg, respectively.

Data recording unit

The average first lactation 305-days milk yield, first lactation total milk yield and peak yield of Kankrej cows maintained in the DR units were 1696.95 ± 109.23 , 1862.24 ± 186.19 and 8.93 ± 0.20 kg, respectively. The average first lactation length was 312.00 ± 25.48 days. The average age at first calving, first service period, first dry period and first calving interval were 1369.54 ± 33.89 , 262.12 ± 34.47 , 175.00 ± 72.75 and 518.67 ± 48.07 days, respectively. The wet and herd averages were 7.48 and 3.80 kg, respectively.

Other activities

During the year, under the project, a total of 4928 farmers/visitors/trainees/students have visited the unit. Additionally, telephonic advice was provided to 250 farmers from various parts of the country. The scientist of the unit also organized two farmer's day in collaboration with Jay Bajrag Gaushala Gela and KVK Khedbrahma, as well as small farmer events at different centers. Scientists and staff working at station have frequently visited farmers' herds and provided technical input regarding animal health, management and feeding.

C) Sahiwal Breed

The GP unit of Sahiwal breed is located at the National Dairy Research Institute, Karnal and three DR units are located at i) Regional Research and Training Centre, Kaljharani,

Bathinda, GADVASU, Ludhiana, ii) G.B. Pant University of Agricultural and Technology, Pantnagar, Uttarkhand and iii) Livestock Farm, LUVAS, Hisar.

Herd Strength

Herd strength of GP unit at NDRI, Karnal as on 31st December 2024 was 455 with 359 females and 96 males. During the period, 77 female and 56 male calves were born, a total of 133 calves. A total of 257 breedable females of above 2 years of age were available of which 71 were heifers, 107 were dry and 79 were in milking. The germplasm unit maintained 54 young bulls of above two years of age.

The numbers of breedable females above 2.5 years of age in GP and different DR units were 655 consisting of 217 in NDRI, Karnal, 150 in LUVAS, Hisar, 111 in GADVASU, Ludhiana and 177 in GBPUAT, Pantnagar. In Sahiwal DR unit of GBPUAT, Pantnagar, 116 calving took place out of which 50 females and 66 males born; in LUVAS, Hisar, 81 calving took place of which 44 female and 37 males calves were born and in GADVASU, Ludhiana, 45 calving were taken place of which 15 females and 30 males born.

Bulls inducted and frozen semen doses produced

A total of 43 Sahiwal bulls in five sets (8 in first, 7 in second, 10 each in third and fourth and 8 in fifth sets) were inducted for progeny testing under the project. During the year, 35449 doses were frozen and 15088 doses were utilized for breeding (Table 1). At the end of year 2024, a total of 201578 (22592 in 1st set, 34156 in 2nd set, 31909 in 3rd set, 74851 in 4th set and 38079 in 5th set) semen doses were available for breeding. Since inception of the project, 351351 semen doses were frozen and 149773 doses were utilized/supplied/sold to the stakeholders and for the project for the genetic improvement of cattle, a total of 201578 doses were available for future use.

Insemination carried out, conception rate and daughters born

During the year 2024, a total of 829 inseminations (269 in NDRI, Karnal, 136 in LUVAS, Hisar, 125 in GADVASU, Ludhiana and 299 in GBPUAT, Pantnagar) were carried out and 394 cows were conceived (127 in Karnal; 73 in Hisar; 70 Ludhiana and 125 in Pantnagar). The conception rate was 36.80% in Karnal, 53.68% in Hisar, 56.00% in Ludhiana, and 41.80% in Pantnagar. During the reporting year, 171 daughters (62 in NDRI Karnal, 44 in LUVAS, Hisar, 15 in GADVASU, Ludhiana and 50 in Pantnagar) were born.

Since inceptions of the project, a total of 4206 inseminations were carried out of which, 1876 cows conceived. The overall conception rate was 44.63 per cent. A total of 1760 daughters (813 in Karnal, 188 in Hisar, 237 in Ludhiana and 522 in Pantnagar) were born.

Set wise performance

A total of 43 bulls in five sets (8+7+10+10+8 bulls) have so far been inducted in the program. The total number of semen doses frozen since inception was 351351 (54754 + 64365 + 56989 + 119039 + 56204 for the first five sets, respectively) of which 149773 frozen semen doses were utilized/ supplied to the stakeholders/ Institutes. A total 201578 doses of frozen semen were available as on 31st December 2024 (Table 2). The total number of cows covered for inseminations in different sets was 1876 (521+300+394+306+355). A total of 771 daughters born with 547 daughters (138+115+149+143+2) having reached the age of first calving and 499 daughters (138+111+146+103 + 1) have completed their first lactation since inception.

Productive and Reproductive performance

The details of productive and reproductive performance of Sahiwal cattle maintained under GP and different DR units are as follows:

Germplasm unit

The average first lactation 305-days milk yield, first lactation total milk yield and first peak yield were 2201.35 ± 78.06 , 2072.51 ± 70.42 and 10.16 ± 0.25 kg, respectively. The average first lactation length was 245.55 ± 12.00 days. The average age at first calving, first service period, first dry period and first calving interval were 1216.02 ± 23.37 , 100.91 ± 6.29 , 110.83 ± 6.76 and 396.13 ± 5.47 days, respectively. The wet and dry averages were 7.6 and 4.4 kg, respectively.

Data recording unit

The 305 days lactation milk yield and first lactation total milk yield were 2017.93 ± 104.91 and 2087.53 ± 113.31 kg in GBPUAT, Pantnagar; 1684.43 ± 79.86 and 1684.43 ± 79.86 kg in LUVAS, Hisar and 1868.57 ± 104.46 and 2209.35 ± 180.49 kg in GADVASU, Ludhiana, respectively. The average first lactation length of Sahiwal cows at Ludhiana, Hisar and Pantnagar were 356.88 ± 22.80 , 234.00 ± 10.73 and 300.09 ± 11.69 days, respectively. The lowest (1167.38 ± 19.69) and highest (1563.00 ± 46.94) days average age at first calving of was observed at respective GBPUAT, Pantnagar and GADVASU, Ludhiana units. However, first service period was lowest (153.69 ± 11.60 days) in GBPUAT, Pantnagar and highest (307.63 ± 43.05 days) in GADVASU, Ludhiana. The respective average first dry period of Ludhiana, Hisar and Pantnagar were 288.29 ± 47.18 , 215.57 ± 26.99 and 104.3 ± 9.7 days. The average first calving interval of Sahiwal in GADVASU, Ludhiana, LUVAS, Hisar and GBPUAT, Pantnagar were 598.25 ± 44.83 , 445.43 ± 43.20 and 433.17 ± 14.04 days, respectively. The first lactation wet averages in Hisar, Ludhiana and Pantnagar were 7.34, 6.67 and 6.95 kg, while, the herd averages were 3.66, 4.18 and 4.87 kg, respectively.

Table-1 Breed wise details of semen doses collected and utilized during the year 2024

Breed	Set No.	No. of bulls inducted	Semen doses produced		Total since inception	Semen doses utilized			Balance as on 31-12-2024
			Up to 31st Dec 2023	Jan-Dec 2024		Up to 31st Dec 2023	Jan-Dec 2024	Total since inception	
Sahiwal	I	8	54754	0	54754	32112	50	32162	22592
	II	7	64365	0	64365	30059	150	30209	34156
	III	10	56989	0	56989	25080	0	25080	31909
	IV	10	103654	15385	119039	35896	8292	44188	74851
	V	8	37440	20064	56204	11479	6646	18125	38079
	Total	43	317202	35449	351351	134626	15088	149773	201578
Gir	I	6	40133	0	40133	21371	0	21371	18762
	II	9	99556	0	99556	26318	110	26428	73128
	III	9	99149	0	99149	21134	185	21319	77830
	IV	9	74750	565	75315	15935	495	16430	58885
	V	7	28274	5410	33685	1640	2505	4145	29540
	Total	40	341863	5975	347838	86398	3295	89693	258145
Kankrej	I	8	8000	0	8000	7009	185	7194	806

	II	9	65119	0	65119	20547	235	20782	44337
	III	9	45412	0	45412	15410	130	15540	29472
	IV	9	69109	0	69109	24618	345	24963	42966
	V	8	26380	8258	34638	15890	6254	20917	12521
	VI	5	3360	1220	4580	83474	500	1752	2828
	Total	43	217380	9478	226858	83499	7649	91148	132930

Table-2 Details of inseminations carried out, conception and daughters born

Breed	Set No.	No. of bulls induced	AI done			Conception			Daughters born		
			Up to Dec 2023	During 2024	Total	Up to Dec 2023	During 2024	Total	Up to Dec 2023	During 2024	Total
Sahiwal	I	8	2290	28	2318	793	10	803	332	4	336
	II	7	1937	0	1937	733	0	733	295	0	295
	III	10	2092	0	2092	886	0	886	373	0	373
	IV	10	2235	0	2235	880	52	932	492	1	493
	V	10	1143	801	1944	560	385	945	97	166	263
	Total	45	9697	829	10526	3852	447	4299	1589	171	1760
Gir	I	6	12289	0	12289	6262	0	6262	3149	0	3149
	II	9	8341	0	8341	4108	0	4108	1648	0	1648
	III	9	6742	18	6760	3035	9	3044	1171	2	1173
	IV	9	8405	84	8489	4124	65	4189	1696	84	1780
	V	1	963	1894	2857	347	801	1148	5	263	268
	Total	34	36740	1996	38736	17876	875	18751	7669	349	8018
Kankrej	I	8	2178	0	2178	1138	0	1138	407	0	407
	II	9	7681	0	7681	3855	0	3855	1257	0	1257
	III	9	6453	0	6453	3038	0	3038	1062	0	1062
	IV	9	7609	3	7612	3555	1	3556	1413	0	1413
	V	10	3178	1864	5042	1267	987	2254	440	347	787
	Total	45	27102	1867	28966	12854	988	13841	4579	347	4926

B. GENETIC IMPROVEMENT OF CROSSBRED CATTLE UNDER FIELD CONDITIONS- FIELD PROGENY TESTING PROJECT (FPT)

Evaluation of bulls through progeny testing and their extensive use has been a major source of genetic improvement in dairy animals. Total 383 young HF crossbred bulls (Frieswal Bull) have been put under the test mating in different sets at four units. Daughters born from 14th sets of bull have completed their 1st lactation milk yield and have evaluated. A total 275 bulls have been evaluated on the basis of their daughter's 1st lactation milk yield. Through the intervention of Field Progeny Testing programme of this Institute the average first lactation 305 days milk yield of the Frieswal progenies in the adopted villages of FPT project has been increased by 69.6 % in KVASU, 45.88 % in GADVASU, 26.96 % in BAIF and 52.36 % in GBPUA&T unit. Subsequently average age at first calving (AFC) of the Frieswal progenies has been reduced by, 12.81 % in KVASU, 14.29 % in GADVASU, 2.82 % in BAIF and 12.92 % in GBPUA&T unit. The details on the comparative performance of crossbred cattle in four different FPT units during the year 2024 are summarized in Table-3.

Table-3. Comparative performance of 4 different units of FPT project during the reporting period (1.1.2024 to 31.12.2024)

PARTICULARS	KVASU THRISSUR	GADVASU LUDHIANA	BAIF PUNE	GBPUAT PANTNAGAR
TOTAL ARTIFICIAL INSEMINATIONS	5004	4864	5739	5175
PREGNANCIES CONFIRMED	1852	2019	1898	2898
CONCEPTION RATE %	47.98	48.2	46.67	53.63
TOTAL CALVING	1295	1635	1628	2222
FEMALE CALVES BORN	622	754	764	983
FEMALE CALVES REACHED AFC	248	507	281	197
FEMALE CALVES COMPLETED 1 ST LACTATION	190	465	206	171
AVERAGE 305 DAYS MILK YIELD (KG)	3322.07	3935.8	3720.51	3700.59
AVERAGE AFC (DAYS)	990.79	1021.56	987.21	955.8
TOTAL LOSS OF DATA (%)	12.6%	20.6	26.69%	13.93

Kerala Veterinary and Animal Sciences University Thrissur, Kerala (KVASU)

As crossbreeding of cattle is the accepted breeding policy in Kerala for genetic improvement of dairy animals as a result more than 95% of cattle of the state are crossbreds. Continued genetic improvement of the crossbred cattle of the state is attempted through the field progeny testing project. It opens up the availability of Frieswal bull semen to the farmers of the state. The progenies born under the project are normally producing 450 to 500 kg milk over and above their contemporaries and hence are in high demand. This increase of around 500 kg in a lactation is providing the farmers a benefit of Rs 15000 to 20000 per year per animal. The increasing number of inseminations under the project is an indicator for increasing popularity of the scheme in Kerala. The first set of bull at KVASU was executed in January 1992. A total of 363 bulls in 18 different sets have so far been inducted in the program. A total 155247 artificial Inseminations have so far been done in which 13917 female progenies were born and a total 3917 female progenies have reached age at first calving (Table-4).

Table- 4. Information regarding different sets of Bulls (KVASU)

SET NO	DATE OF START	TOTAL BULLS USED	TOTAL INSEMINATIONS	TOTAL AI'S FOLLOWED	PREGNANCIES CONFIRMED	CONCEPTION RATE (%)	FOLLOWED FOR CALVING	FEMALE CALVES	
								BORN	REACHED AFC
I	01/01/1992	12	23351	6722	2420	36	1902	956	319
II	01/04/1994	11	12817	4800	1680	35	1300	603	240
III	01/07/1995	11	9331	3942	1324	33.6	1065	757	89
IV	01/11/1998	15	11750	3753	1501	39.9	1489	676	178
V	01/07/2001	17	3437	3261	1136	34.8	847	401	139
VI	01/07/2003	20	8173	7683	2582	33.6	1689	746	216
VII	01/02/2005	24	5759	5211	2281	43.7	1298	597	180
VIII	01/09/2006	22	5703	5514	2472	44.8	1538	768	160
IX	01/02/2008	16	3393	3131	1181	37.7	801	394	81
X	01/07/2009	24	5781	5612	2124	37.8	1324	664	162
XI	01/04/2011	21	4820	4401	2006	45.6	1280	659	235
XII	01/08/2012	28	6045	5531	2357	42.6	1302	642	262

XIII	01/03/2014	14	5211	4850	2063	42.0	1114	545	257
XIV	01/07/2015	29	9682	9243	4147	44.9	2515	1229	516
XV	02/08/2017	26	10735	10191	4639	45.5	2733	1361	480
XVI	09/08/2019	25	14591	13242	5516	41.7	3159	1524	396
XVII	10/12/2021	23	9010	7962	3821	48.0	2390	1163	7
XVIII	05/10/2023	24	5658	3734	1662	44.5	488	232	0
TOTAL		362	155247	108783	44912	40.65	28234	1391	3917
								7	

During the period of report a total of 5004 artificial inseminations were carried out with the overall conception rate as 47.98 %. The average first lactation 305 days milk yield of daughters completed their first lactation in the reporting period (2024) was 3319.51±38.61kg. The average age at first calving of daughters was 996.5 ±7.18 days during this reporting period. The loss of data in the project was 0.07 % in 16th set, 10.1 % in 17th set, 12.6 % in 17th set of bull till the end of report period. About 3110 daughters from first fifteen sets of bulls have completed their 1st lactation 305 days milk yield. There is a consistent trend of increase in 1st lactation 305 days milk yield of daughters in subsequent sets of bulls.

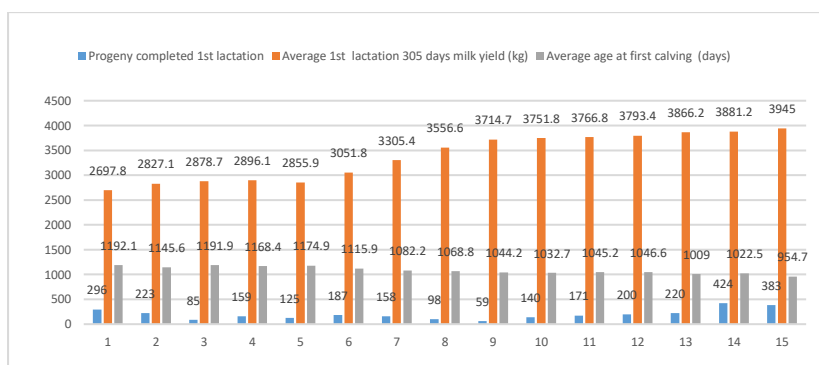


Fig. 1 Set wise Progeny Performance at KVASU unit since inception.

In the 1st set of bulls (1992) it was recorded as 1958.4 kgs and in currently under recording set of bull (16th & 17th) it was recorded as 3319.51 kgs which indicates a sharp increase of 1361.5 kgs milk (69.4%) in progenies of bulls under test. A trend of decrease in age at first calving was also observed in subsequent sets of bulls. It was recorded as 1136.4 days in progenies of first set of Bulls (1992) and which has reduced to 996.5 days in currently under recording set which indicate a sharp decrease of 139.9 days (14.03 %) in AFC (Fig.1).

Calving of 17th set of bulls has completed. Recording of first lactation milk yield of daughters of 14th set of bulls had completed and evaluated. The 15th set of bulls is under final stage of recording till the end of reporting period. The age at first calving of progenies is continued to be significantly lower than that of contemporaries.

Socio-economic status of farmers under the project

Socio- economic status of 478 dairy farmers in Thrissur district have been collected and analyzed. Socio economic status of the farmers owning progeny calved during the period and the production performance of the progenies in different group is presented in the Table-5. Majority of the farmers are classified as Agricultural Farmer and accounts for 72.2 % of the total registered farmers. This is clear indication that livestock is only a subsidiary enterprise for these farmers. Agricultural labours accounts for 17.1 % and the other occupational groups of owners are negligible. Majority of the farmers (37.0 %) are having an educational level of primary.

Table- 5. Production performance of the animals according to different categories of farmers

CATEGORY	NO. OF OBSERVATIONS	PERCENTAGE (%)	AVERAGE 1 ST LACT.305 DAYS MILK YIELD (KG)	
			AVERAGE	No.
OVERALL MEAN	478	100	3408.85 ± 42.86	144
FEEDING SYSTEM				
1. WITH FODDER	164	34.3	3420.42	50
2. WITHOUT FODDER	314	65.7	3402.69	94
EDUCATION STATUS OF OWNER				
1. ILLITERATE	13	2.7	3207.50	3
2. PRIMARY	177	37.0	3395.52	53
3. MATRIC	171	35.8	3351.47	53
4. SECONDARY	59	12.4	3422.14	18
5. COLLEGE	58	12.1	3650.74	17
HERD SIZE				
1. <3	212	44.4	3379.99	62
2. 4 TO 5	135	28.2	3470.07	37
3. 6 TO 10	103	21.5	3363.27	35
4. >10	28	5.9	3520.75	10
LAND HOLDING				
1. LANDLESS	0	0	3357.00	5
2. BELOW 10 CENTS	20	4.2	3531.42	46
3. 10 TO 49 CENTS	153	32.0	3184.29	21
4. 50 TO 99 CENTS	92	19.2	3300.35	39
5. 1 TO 2 ACRES	103	21.6	3676.00	15
6. 2 TO 3 ACRES	57	11.9	3559.58	6
7. 3 TO 4 ACRES	24	5.0	3296.88	12
8. MORE THAN 4 ACRES	29	6.1	3357.00	5
OCCUPATION OF OWNER				
1. AGRIC. FARMER	345	72.2	3392.32	114
2. AGRIC. LABOUR	82	17.1	3349.40	21
3. GOVERNMENT JOB	11	2.3	4193.75	2
4. PRIVATE JOB	21	4.4	3637.92	6
5. BUSINESS	19	4.0	3597.50	1

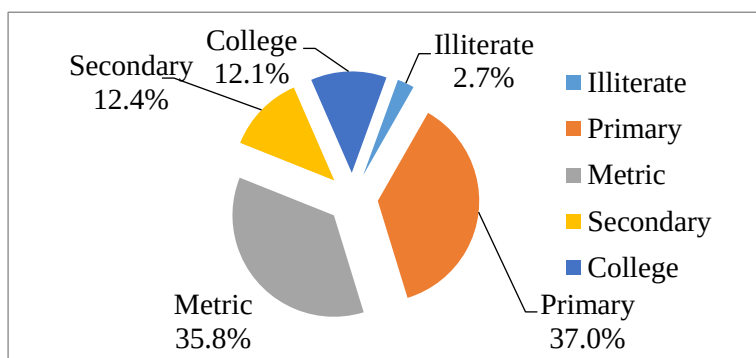


Fig. 2. Education level of Animal owners participating in the project

The proportion of illiterate farmers are negligible (2.7 %). The farmers with primary level of education accounted for 35.8 % followed by those with metric and college qualification (Fig-2). Artificial Insemination centres covering 276 villages in Ludhiana district. Four of these AI centres are operated by Punjab State Department of Animal Husbandry and others by trained inseminators. A total 23233 farmers have so far been registered and benefited through this project. During the year a total of 4864 artificial inseminations were conducted with frozen semen of 24 bulls of 17th set and 24 bulls of 18th set with overall conception rate 48.2 %. The average first lactation 305 days milk yield of daughters completed their first lactation in the reporting period (2024) was found as 3935.8 kg. The average age at first calving for daughters was recorded as 1021.56 days in this reporting period 2024. About 20.6 % of the data was lost due to different causes and the sale of the animals was the major cause of the loss of data. The set wise progeny performance was as a total of 184, 154, 397, 361, 361, 278, 351, 326, 647, 576, 690, 806, 768, 904 and 310 progenies of 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th and 17th sets, respectively of test bulls completed their first lactation 305.

The land holding pattern showed that major part (32.0%) of the farmers had a land holding of 10-49 cents. Farmers with 50-99 cents and 1-2 acres of land holders were 19.2 and 21.6 % respectively. 11.9 % farmers having 2-3 acres of land. Only 6.1 % farmers having land holding of more than 4 acres whereas, farmers having 1-2 acres of land shows the highest milk production among the progenies of Frieswal cattle and recorded as 3676.00 kgs (Fig-3). The farmers with three or less than three animals accounted for 44.4 % of the progeny owners. The farmers with more than 10 animals in their herd were low (5.9%) followed by 6-10 animals (21.5%) and 4-5 animals (28.2%), respectively.

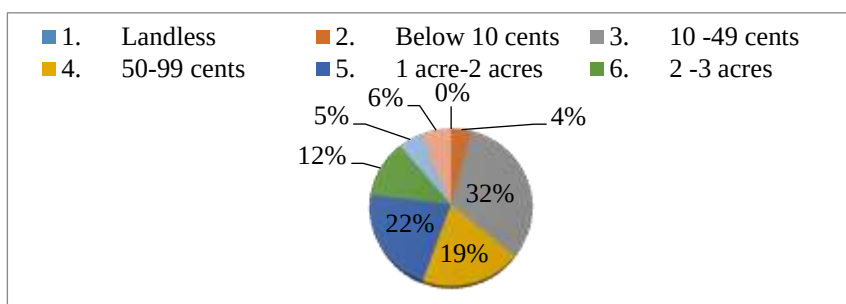


Fig. 3. Land Holding pattern of Animal Owners participating in the project

Guru Angad Dev Veterinary & Animal Sciences University (GADVASU), Ludhiana

The Artificial insemination work of the Field Progeny Testing project is undertaken through 33 days milk production and their average first lactation 305 days milk production was 2697.8 ± 40.1 , 2827.09 ± 48.7 , 2878.7 ± 25.5 , 2896.1 ± 26.0 , 2855.9 ± 25.9 , 3051.8 ± 24.5 , 3305.4 ± 28.9 , 3556.6 ± 31.2 , 3714.7 ± 22.9 , 3751.8 ± 22.9 , 3766.8 ± 21.1 , 3793.4 ± 17.7 , 3866.2 ± 15.7 , 3881.2 ± 15.8 , and 3945.0 ± 25.6 , respectively. A total 382 bulls has so far been introduced in 18 different sets and total 180381 inseminations done in which 26880 female progenies were born, out of which 8960 has reached age at first calving (Table-6). In first set of bulls (1995), the average 305-days milk yield of daughters was 2697.8 kg and in currently under recording set of bull (16th set) it was 3935.8kg indicating a sharp increase of 1238.0 kg milk (45.88%) in the daughters of bulls under test. The AFC of daughters in first set of bull (1995) was 1192 days which has reduced to 1021.56 days in currently under recording set of bulls (17th) showing a sharp decrease of 170.4 days (14.29 %) (Fig. 4).

Field Progeny Testing Project has major contribution in changing the scenario of dairy farming in the adopted villages in Ludhiana district by providing technical knowhow, germplasm and motivation to farmers. The supply semen of high genetic potential test bulls and progeny tested bulls to the farmers in the villages adopted under the Field Progeny Testing Project has helped in improving their economic level. With the result of supply of high-quality semen of test bulls has increased to 3935.8 kg.in the year 2024. Some progressive dairy farmers after getting training and superior germplasm from the project have established outstanding crossbred herds with first lactation milk yield of more than 6400 kg and peak yield of more than 40 kg a day.

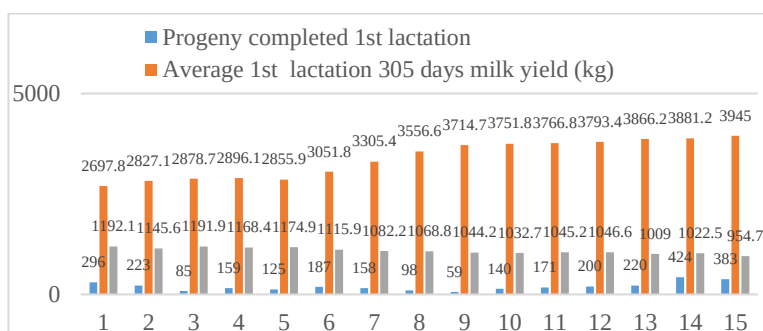


Fig.- 4. Set wise progeny performance at GADVASU unit since inception

Socio-economic status of farmers under the project

The production performance of the animals according to different categories of farmers (Table 7) showed that the farmers maintaining their cows with fodder production had higher milk yield of their crossbred cows than the cows maintained by farmers without fodder. Crossbred cows maintained by farmers having adequate fodder supply produced 3937.5 ± 96.9 kg (n=455) during first lactation against 3881.2 ± 141.5 kg (n=10) of milk by the farmers having little or no green fodder supply. Commercial farmers had high milk yield (3958.2 ± 19.4 kg) of their animals than the non-commercial farmers (2220.7 ± 326.3 kg) with the availability of remunerative milk prices, the commercial farmers give more attention to feeding and management practices.

Highest milk production (3962.9 ± 39.1 kg) was recorded by owners having secondary level of education. Lower educated owners have more awareness and practiced dairying on scientific lines for getting higher productivity (Fig. 5). The farmers having herd size of 6 to 10 animals had the maximum lactation milk yield of their cows (4127.0 ± 49.7 kg).

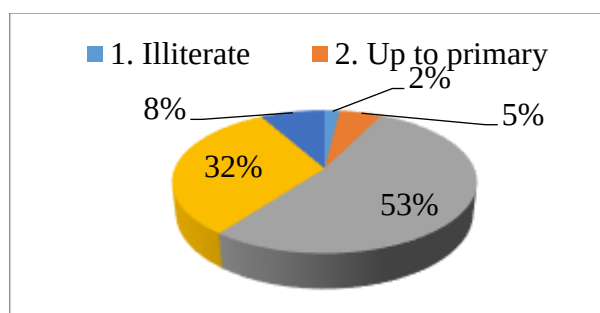


Fig. 5. Education Level of Animal Owners participating in the project

Table- 6. Information regarding different sets of Bulls (GADVASU)

SET NO.	DATE OF START	TOTAL BULLS USED	TOTAL AI	TOTAL A.I.'s FOLLOWED	PREGNANCIES CONFIRMED	CR %	FOLLOWED FOR CALVING	FEMALES CALVES	
								BORN	REACHED AFC
II	1.04.95	18	7595	7355	3065	41.7	3000	855	227
III	1.01.97	10	5150	4865	2132	43.8	2000	789	210
IV	1.01.99	23	18006	17159	8258	48.1	8000	1844	562
V	16.12.01	30	12548	11504	5720	49.7	5720	1368	490
VI	1.04.03	22	10409	10154	4362	43.0	4362	1497	478
VII	1.2.05	25	8265	8105	3476	42.9	3476	1181	359
VIII	1.8.06	22	9710	9710	3999	41.1	3999	1120	448
IX	1.1.08	16	9611	9611	3898	40.6	3898	1186	461
X	1.7.09	24	14581	14581	5679	38.9	5679	1671	885
XI	1.3.11	20	12971	12971	5604	43.2	5604	2072	688
XII	1.8.12	28	15662	15662	7008	44.7	7008	2500	771
XIII	1.2.14	15	6662	6662	3039	45.6	3039	1321	861
XIV	1.8.15	30	8299	8299	3851	46.4	3851	1571	795
XV	1.6.17	26	10715	10715	5043	47.1	5043	2225	1044
XVI	1-6-19	25	16514	16514	8311	50.3	8311	3406	679
XVI I	22-11-21	24	9243	9243	4836	52.3	4836	1934	2
XVI II	29-09-23	24	6440	4188	2019	48.2	2019	340	0
	TOTAL	382	182381	177298	80300	45.3	79845	26880	8960

Table-7. Production performance of the animals according to different categories of farmers

CATEGORY	No.	PERCENTAGE	1 ST LACT. 305-DAYS MILK YIELD (KG.)
OVERALL MEAN	465	100	3935.8±21.5
FEEDING SYSTEM			
1. WITH FODDER	455	96.9	3937.5±96.9
2. WITHOUT FODDER	10	3.01	3881.2±141.5
TYPE OF FARMER			
1. COMMERCIAL	459	98.7	3958.2±19.4
2. NON-COMMERCIAL	6	1.29	2220.7±326.3
EDUCATION			
1. ILLITERATE	9	1.9	3908.6±113.4
2. UP TO PRIMARY	25	54.3	3588.2±120.2
3 UP TO MATRIC	246	52.9	3955.1±27.6
4. UP TO SECONDARY	147	31.6	3962.9±39.1
5. COLLEGE LEVEL	38	8.2	3941.4±78.0
HERD SIZE			
1. ≤ 3	433	93.1	3938.1±22.5
2. 4 TO 5	19	4.1	3862.6±107.2
3. 6 TO 10	6	1.3	4127.0±49.7
4. > 10	7	1.5	3828.3±168.8
LAND HOLDING			
1. LANDLESS	20	4.3	3967.6±64.3
2. LESS THAN 1 ACRE	8	1.7	3844.2±162.6
3. 1 TO 2 ACRES	48	10.3	3663.9±89.7
4. 2 TO 5 ACRES	110	23.6	4003.8±34.6
5. 5 TO 10 ACRES	228	49.0	4040.1±25.2
6. > 10 ACRES	51	10.9	3580.7±85.4
OCCUPATION OF OWNER :			
1. AGRIC. FARMER	409	87.9	3974.9±21.1
2. AGRIC. LABOUR	18	3.9	3662.8±118.8
3. SERVICE	1	0.21	2187.6±0.0
4. BUSINESS	1	0.21	3451.0±0.0
5. DAIRYING	34	7.3	3708.2±110.5
6. OTHERS	2	0.43	3372.7±257.6

ssIt was also observed that animals of the farmers having 5-10 acres of land produced maximum milk as 4040.1±25.2 kg. Total 87.9 % of the owners having Agriculture occupation as their whole-time occupation. The milk production of the cows reared by such farmers was 3974.9±21.1 kg which was significantly higher than the milk production of animals of owners having other than of these occupations (Fig. 6). This could be due to the fact that the agricultural farmers are giving more attention towards dairy farming along with agriculture farming and providing good quality feed, fodder, health care and management to the animals.

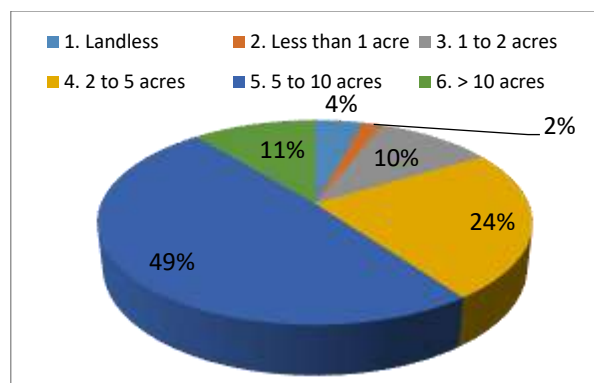


Fig. 6. Land holding pattern of Animal Owners participating in the project

BAIF Development Research Foundation, Uruli-Kanchan, Pune

Data generated over 29 years period from 1995 to 2024 on 6816 crossbred progenies reached to age at first calving (AFC) born out of 359 sires and owned by 1198 farmers spread over 143 village in 27 cattle developing centers from Ahmednagar, Pune and Satara district of Western Maharashtra. Out of this crossbred progeny born, 4899 completed their first lactation milk yield. A total of 359 bulls from 18 different sets have so far been used for insemination. A total 156569 Artificial Inseminations have so far been done out of which 146626 AI followed and 66807 progenies were confirmed, leading to a conception rate of 45.56 %. A total 19829 female progenies were born and 6816 female progenies have reached at the age of first calving through the use of semen of these test bulls (Table-8).

A total of 4899 daughters from first 16 sets of bulls have completed their first lactation records. The first lactation 305 days milk yield showed an increasing trend among the progenies of different sets. During the year 2024, a total of 5739 artificial inseminations were carried out with the overall conception rate 46.67%. Average first lactation 305 days milk yield of daughters completed their first lactation in the reporting period (2024) was 3720.51 kg. The average age at first calving of daughters was recorded as 987.21 days in this reporting period 2024. The overall loss of data was recorded as 26.69% till the end of this reporting period. There is a trend of increase in 1st lactation 305 days milk yield of daughters in subsequent sets of bulls. In the 1st set of bull (1995), it was recorded as 2930.4 kg and in currently under recording set of bull (16th & 17th), it was recorded as 3720.51 kgs which indicates a sharp increase of 790.11 kg (26.96%) milk per lactation in progenies of bulls under test. A trend of decrease in age at first calving was also observed in subsequent sets of bulls. It was recorded as 976.5 days in progenies of first set of Bulls (1995) and which has reduced to 948.91 days in currently under recording set of bull which indicate a sharp decrease of 27.6 days (2.82%) in Age at First Calving (Fig. 7).

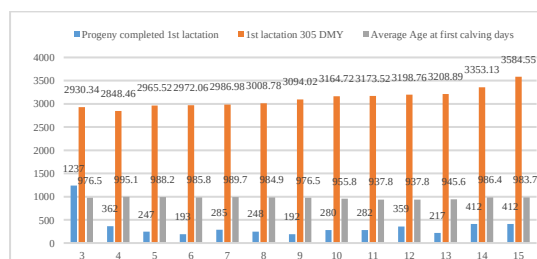


Fig. 7. Set wise Progeny Performance at BAIF unit since inception

Table-8: Information regarding different set of bulls in BAIF unit

SET NO	BULL BATCH START DATE	BULLS USED	A.I. DONE	A.I. FOLLOWED	PREGNANCIES CONFIRMED	CONCEPTION RATE	FOLLOWED FOR CALVING	FEMALE CALVES	
								BORN	REACHED AFC
III	JUL-95	20	16118	15063	7001	46.48%	4868	2344	1563
IV	JUL-98	19	21321	17239	7673	44.51%	3815	1756	514
V	JUL-01	20	7461	7380	3398	46.04%	2626	1201	364
VI	JUL-03	20	5249	5162	2162	41.88%	1493	731	289
VII	FEB-05	25	6806	6638	2989	45.03%	1969	856	394
VIII	SEP-06	22	6533	6327	2899	45.82%	1993	885	371
IX	FEB-08	16	4902	4902	2169	44.25%	1561	733	313
X	AUG-09	24	6893	6867	2987	43.50%	1997	878	391
XI	APR-11	21	6364	6364	3109	48.85%	2270	1010	409
XII	AUG-12	28	9270	9030	4190	46.40%	2509	1182	504
XIII	MAR-14	15	7139	7139	3221	45.12%	2536	1163	305
XIV	AUG-15	30	14223	14189	6196	43.67%	4007	1783	578
XV*	JUL-17	26	12535	12301	5515	44.83%	3888	1840	573
XVI*	JUL-19	25	15265	14819	7220	48.72%	3971	1823	248
XVII**	DEC-21	24	10751	9170	4205	45.86%	3593	1644	0
XVII I	DEC-23	24	5739	4067	1898	46.67	0	0	0
TOTAL		359	156569	146626	66807	45.56%	43096	19829	6816

Table 9: Production performance of the animals according to different categories of farmers: BAIF*A. Education Status of farmers participating in the project.*

EDUCATION LEVEL	ILLITERATE	PRIMARY	SECONDARY	HIGHER SECONDARY	GRADUATE & ABOVE	TOTAL
NO. OF COW OWNERS	84 (9.39%)	539 (40.41%)	455 (37.09%)	72 (8.51%)	48 (8.59%)	1198

B. Landholding-wise frequency of farmers.

FREQUENCY OF FARMERS	LANDHOLDING (ACRES)				TOTAL
	0	UP TO 5	5 TO 10	ABOVE 10	
ACCORDING TO TOTAL LANDHOLDING	72 (4.26%)	686 (59.12%)	356 (25.88%)	84 (10.74%)	1198
ACCORDING TO LAND UNDER FODDER CROP	340 (28.38%)	802 (66.94%)	54 (4.50%)	03 (0.25%)	1198

C. Main Occupation of farmers participating in the project.

OCCUPATION TYPE	AGRICULTURE	DAIRY	SERVICE	OTHER	AGRICULTURE LABOR	BUSINESS	TOTAL
NO. OF COW OWNERS	1103 (92.07%)	54 (4.50%)	14 (1.16%)	9 (0.75%)	8 (0.66%)	10 (0.83%)	1198

D. Types of cattle housing in the project area.

HOUSING TYPE	PERMANENT	SEMI-PERMANENT	TEMPORARY	THATCHED	TOTAL
NO. OF HERDS	389 (32.22%)	361 (30.13%)	332 (27.71%)	116 (9.68%)	1198

Note. Figures in parenthesis indicate the percentage

The 14th bull set completed milk recording of their progenies and evaluated where 15th, 16th and 17th sets are under recording. The status of feeding and management of crossbred animals in field has favorably changed due to frequent visits of scientists and discussions with herd owners. Process of identification of quality sires based on their progeny is standardized and their use in development process for improving milk production in rural dairy animals demonstrated. The information generated through the project is used by the farmers for marketing animals and getting more price to their animals whenever they sale recorded animals.

Socio-economic status of farmers under the project

Socio-economic status of the farmers owning progenies of the project during the reporting period and the performance of progenies in different groups is presented in the Table 9. Out of total 1198 farmers, 40.41% farmers had education up to primary level. The percentage of farmers having secondary education was 37.09, whereas the proportion of illiterate cow owner was 9.39%. The percentage of farmers having education graduate and above was 4.59. The average herd size in the project operational area was found to be 8.61 (fig. 8).

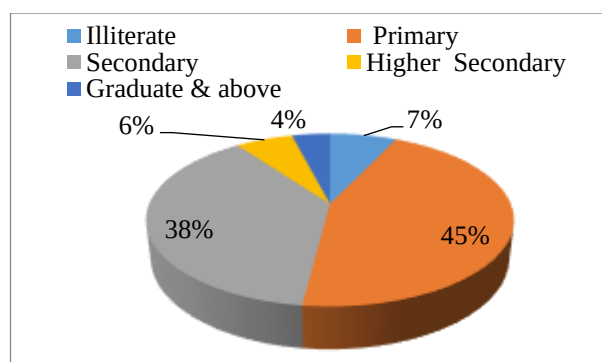


Fig. 8. Education status of Animal Owners participating in the project

Among landholders, more than 2/3rd (71.64%) cattle owners were found cultivating different fodder crops. The proportion of landless and those who didn't have land under fodder crop was 6.01 and 28.35 percent respectively. The fodder crops generally grown are sorghum, bajra, sugarcane, lucerne and maize. The dry and green fodders, thus, available to animals are sorghum straw, bajra straw, sugarcane tops, lucerne and maize. In concentrate, farmers are found to feed ready-made feed purchased from market. The thumb rule of concentrate feeding is half kg for every litre of milk produced. Due to non-availability of sufficient land, grazing is not practiced and the animals are managed intensively.

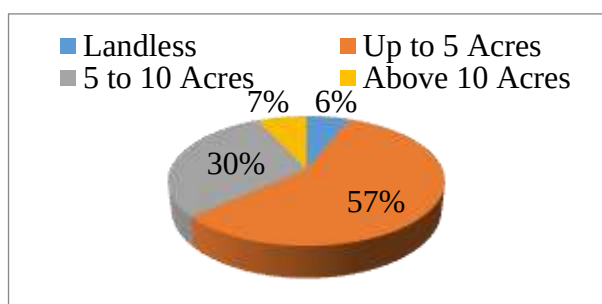


Fig. 9. Land Holding pattern of Animal Owners participating in the project

About 92.07 per cent of cattle owners were agriculturists and almost all (93.98%) owned land. Nearly, 57 per cent farmers had land up to 5 acres and the percentage of farmers having land more than 10 acres was 7.01 per cent (Fig. 9)

The herd owners protect their animals from infectious diseases by preventive vaccinations against FMD, HS and BQ regularly. For external parasite control, insecticides were used. The use of internal parasiticides was found restricted to calf hood stage. Regarding veterinary aids whenever required, help from nearby Govt. Dispensaries is sought. Approximately 62.60% of herd owners had permanent or semi-permanent cattle sheds for their animals. The cattle sheds were found constructed from either bricks, stones using clay as a cementing material or re-in-force cement concrete. About 27.71 per cent owners had temporary type and 9.68 per cent thatched type of housing to their animals, which was made by using wood, dried wheat straws or bajra stovers. None of the animal was kept without shelter.

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The project is being implemented presently through 8 A.I. centers of U.S. Nagar and Nainital districts of Uttarakhand. During the year 2024, a total of 5175 A.I. were carried out, 5403 A.I. were follow-up, and 2898 PD were confirmed, leading to a 53.63% conception rate. A total of 983 daughters (643 of Set-17 & 340 daughters of Set-18) took birth, and 197 daughters (1 of Set-15 and 194 of set-16 and 3 of Set-17) reached at AFC and 171 daughters (25 of Set-15, 146 of Set-16) completed their 1st lactation (Table-10).

The average first lactation 305 days milk yield of daughters completed their first lactation during the reporting period (2024) was 3700.59 kg. The average age at first calving of daughters was 955.8 days during the reporting period. The overall loss of data was 13.93 % till the end of this reporting period. About 1999 daughters from first 7 sets of bulls have completed their 1st lactation 305 days milk yield. There is a trend of increase in 1st lactation 305 days milk yield of daughters in subsequent sets of bulls. I

n the daughters of 1st set of bulls (2010) it was 2494.8 kgs and in daughters of currently under recording set of bull (16th & 17th) it was 3801.12 kg which indicates a sharp increase of 1306.3 kg (52.36%) milk in progenies of bulls under test. A trend of decrease in age at first calving was also observed in subsequent sets of bulls. It was 1149 days in progenies of first set of bulls (2010) and which has reduced to 1000.5 days in currently under recording set of bull which indicate decrease of 148.5 days (12.92 %) in Age at first calving (Fig. 10).

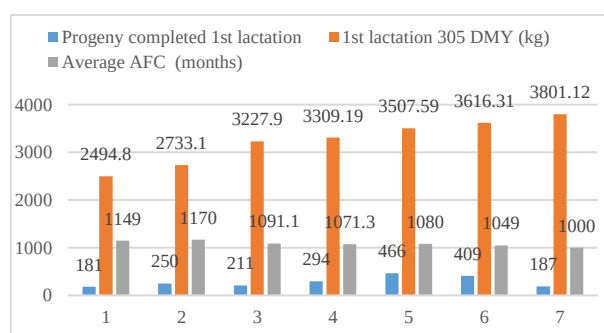


Fig. 10. Set wise progeny performance at GBPUA & T, Pantnagar unit since inception

Table-10: Information regarding different set of bulls in GBPAU & T, Pantnagar unit.

SET NO.	DATE (FSD RECEIVED)	FSD RECEIVED	BULLS USED	TOTAL A.I.	A.I. FOLLOWED	PREGNANCY CONFIRMED	TOTAL CALVING	FEMALE CALVES	
								BORN	REACHED AFC
10	20.01.2010	3000	10	1784	1750	1030	782	340	201
11	16.03.2011	2906	06	2303	2303	1546	1207	542	296
12	25.07.2012	3150	09	2473	2473	1405	1215	573	224
	04.09.2013	1260							
13	05.02.2014	7350	15	5205	5205	2944	2433	1058	308
14	22.07.2015 17.06.2016	13538	30	9787	9787	5414	4582	2126	511
15	15.06.2017 12.10.2018	12989	26	9886	9871	5664	4587	2160	462
16	25.06.2019 09.02.2021	15784	25	12568	12462	7107	5545	2492	374
17	30.11.2021	11859	24	9428	9282	5026	4072	1799	4
18	11.10.2023	11760	24	5766	4392	2350	725	340	-

TOTAL	83596	169	59200	57525	32486	25148	11430	2380
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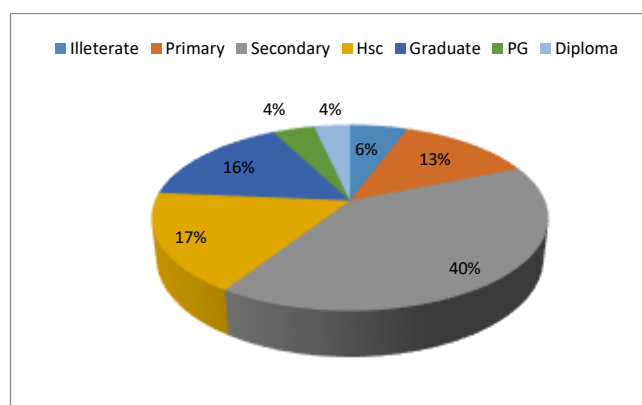


Fig. 11. Education status of Animal Owners participating in the project

Socio-economic status of farmers under the Project

Socio-economic status of the farmers owning progenies under the project during reporting period (2024) and their contribution in animal rearing in different groups are presented on table- 11.

The educational status of the owners of the progenies were analyzed. The owners of animals with an educational qualification of higher secondary were 17.3%. Illiterate owner were 5.6% and 40.3% of the owners were having an educational qualification of Matriculation whereas 16.0 % of the owners were having graduate/college qualification and 4.1% owners having post graduate qualification (Fig-11).

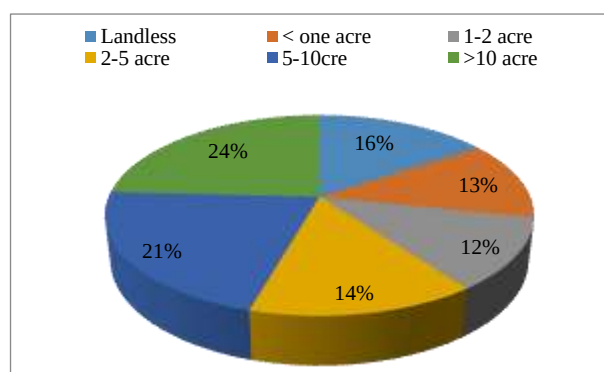


Fig. 12. Land Holding pattern of Animal Owners participating in the project

According to land holding patterns about 24.2% farmers were having more than 10 acres of land, 12.7% farmers having less than one acres and 15.6 farmers are landless whereas 21.4% farmers having 5-10 acres of land. About 25% farmers (11.6% up to 2 acres and 14.5%, up to 2-5 acres) (Fig-12). A total of 4 field level training programs, 2 animal welfare camps and 11 Kisan-Chaupal were conducted in field where in 381 farmers took active part to understand the programme. The two success stories of farmers adopting Frieswal animals in the project is submitted.

Table. 11. Status of Farmers participating in the project according to different Category.

EDUCATIO N	ILLETER ATE	PRIMAR Y	SECONDA RY	HSC	GRADUAT E	PG	DIPLO MA
	5.6	13.2	40.3	17.3	16.0	4.1	3.5

LAND HOLDING	LANDLES S	< 1 ACRE	1-2 ACRE	2-5 ACRE	5-10 ACRE	>10 ACRE	-
	15.6	12.7	11.6	14.5	21.4	24.2	-
OCCUPATI ON	FARMER	LABOU R	SERVICE	BUSINES S	DAIRY	OTHER	-
	65.4	18.9	10.0	1.4	3.3	1.0	-
HOUSING	ATTACHE D	SEPARA TE	-	PERM.	SEMI PERM.	TEMP.	THATC H
	52.5	47.5	-	64.1	20.8	13.7	1.4
FEEDING	STALL	GRAZIN G	BOTH	-	-	-	-
	97.8	1.1	1.1	-	-	-	-

(II) Institutional Programmes:

A. Semen Production and Distribution

Germplasm production and performance of Frieswal bulls

During the year 2024, germplasm production was actively carried out in Frieswal bulls, where semen samples from 43 bulls were frozen after meeting the minimum quality criteria set by the Central Monitoring Unit (CMU), which includes a semen volume of at least 1.0 ml, sperm concentration of 500 million/ml, and initial progressive motility of 70%, with post-thaw motility exceeding 50%. A total of 73,144 semen doses were produced for future breeding, research projects, and various cattle development programs. Overall, 3,341 ejaculates were collected from 62 Frieswal bulls. The mean semen characteristics observed were 5.18 ± 0.03 ml for ejaculate volume, 1243.31 ± 8.09 million/ml for sperm concentration, $59.11 \pm 0.23\%$ for initial progressive motility, and $39.56 \pm 0.19\%$ for post-thaw motility. In addition, 17,220 frozen semen doses were made available to the institute's Semen Distribution Centre for implementation of the Field Progeny Testing Project and distribution to various developmental agencies, institutions, para-veterinarians, and progressive farmers to support ongoing cattle genetic improvement programs.

Germplasm production and performance of Sahiwal bulls

In the case of Sahiwal bulls, a total of 13,290 semen doses were frozen from six selected bulls. The evaluation of semen quality was based on 343 ejaculates collected from seven bulls throughout the year. The average semen volume recorded was 4.29 ± 0.08 ml, while the sperm concentration was 1227.58 ± 26.21 million/ml. The initial motility and post-thaw motility were found to be $61.98 \pm 0.61\%$ and $37.58 \pm 0.66\%$, respectively. From the total production, 759 semen doses were disbursed to the Semen Distribution Centre for distribution, sale, and use in various cattle breeding and development initiatives.

Quality assessment of Frieswal bull semen (QC Laboratory)

Frozen semen samples (121) from breeding bulls were evaluated for semen quality parameters like post thaw motility, incubation test, acrosome integrity, hypoosmotic swelling test (HOST), sperm concentration and microbial load. Post thaw semen quality was evaluated in randomly selected two cryopreserved straws per bull (0.25 ml, French mini), thawed at 37°C for 30 seconds. The percent progressive motility following thawing at 0, 60, 120 minutes of incubation at 37°C were 51.09 ± 0.28 , 33.09 ± 0.49 and 21.57 ± 0.38 , respectively. The plasma membrane integrity (%) as determined by hypoosmotic swelling test (HOST) was 44.83 ± 0.33 while acrosome integrity (%) as determined by Giemsa staining was 73.55 ± 0.31 . The average sperm concentration per 0.25 ml straw was 21.65 ± 0.10 million. The mean bacterial load per ml recorded in the frozen semen samples of the bulls was 780.39 ± 105.08 CFU. Microbial load of glassware, AV and Laminar air flow was nil.

The neat semen of 24 newly introduced bulls was assessed for viability and morphology using eosin - nigrosin stain and acrosome integrity by Giemsa staining. The average percent live sperms and abnormalities of the head, mid piece and tail were 71.53 ± 0.67 , 8.24 ± 1.16 , 6.28 ± 1.32 and 5.27 ± 1.11 , respectively and average percent of intact acrosome was 74.16 ± 1.59 . Neat semen from seven problems bulls, whose semen was frequently rejected due to poor motility, was also assessed for viability and morphology. The average per cent live sperm was 58.85 ± 3.86 and the abnormalities of sperm head, mid piece and tail were 9.88 ± 2.82 , 8.84 ± 1.37 and 3.25 ± 0.36 percent, respectively.

Table 1: The quality control parameters of frozen- thawed Frieswal bull semen.

Semen attributes (N=121)	Mean ± SEM
PTM (%)	51.09±0.28
Motility after incubation for 60 mins (%)	33.09±0.49
Motility after incubation for 120 mins (%)	21.57±0.38
HOST (%)	44.83±0.33
Acr-Int (%)	73.55±0.31
Concentration (million/straw)	21.65±0.10
CFU/ml	780.39±105.08

Table 2: Quality control parameters for viability and morphology of Frieswal bull semen (neat semen)

Parameters	New bulls (n=72 samples)	Problem bulls (n=7)
Live (%)	71.53±0.67	58.85±3.86
Abnormal head (%)	8.24±1.16	9.88±2.82
Abnormal mid piece (%)	6.28±1.32	8.84±1.37
Abnormal tail (%)	5.27±1.11	3.25±0.36
Total abnormality (%)	19.74±2.89	22.06±2.31
Intact Acrosome (%)	74.16±1.59	-

B. Augmentation of Breeding and Reproductive Efficiency

(i) Optimization of Guide RNA for CRISPR/Cas9-Mediated Knockout of CD46 in Cattle Fibroblasts

The project was initiated last year with the procurement of all necessary reagents and materials. Its primary objective is to optimize guide RNAs (gRNAs) for CRISPR/Cas9-mediated knockout of the CD46 gene in cattle fibroblasts, with the aim of reducing susceptibility to bovine viral diarrhoea virus (BVDV). BVDV poses a significant challenge to cattle health and the livestock industry worldwide, causing immunosuppression, respiratory and gastrointestinal disorders, reproductive failures, and resulting in considerable economic losses. The virus enters host cells through receptor-mediated endocytosis, with the transmembrane glycoprotein CD46 serving as a key entry receptor. Genome editing of CD46 has therefore emerged as a promising strategy to decrease cellular susceptibility to BVDV infection. However, it is crucial to optimize this approach to preserve the essential physiological functions of CD46, such as complement regulation and immune modulation.

During the course of this project, we focused on the design and optimization of highly specific and efficient gRNAs targeting the bovine CD46 gene. Advanced bioinformatics tools were employed to identify optimal gRNA sequences, with particular emphasis on minimizing potential off-target effects to ensure both the safety and efficacy of the genome editing process. Following the design phase, these gRNAs were synthesized and are now ready for experimental validation.

In the next phase, these synthesized gRNAs will be cloned into a vector and tested for their effectiveness in facilitating targeted gene editing in vitro using cattle fibroblast cultures. Successful validation will provide a robust foundation for further functional studies in cell culture and will also pave the way for future in vivo experiments aimed at generating BVDV-resistant cattle. The ultimate goal of this research is to develop innovative genetic approaches that enhance disease resistance in livestock, thereby reducing economic losses and contributing to more sustainable and resilient cattle production systems. The long-term impact of this work will depend on further validation and comprehensive assessment of the safety and efficacy of the edited animals under real-world conditions.

(II) Multiplication of Superior Indigenous Cattle Germ-plasm through Multiple Ovulation and Embryo Transfer (MOET):

During the reporting period, a comparative evaluation of superovulatory responses in Sahiwal cows was conducted using two exogenous gonadotropins—Folltropin-V and Stimufol—administered over two treatment durations (4-day and 5-day regimens). The efficacy of each protocol was assessed based on ovarian follicular development, corpora lutea (CL) formation, embryo yield, and associated hormonal profiles. On the day of artificial insemination (AI), the mean number of follicles observed in Group I (5-day Folltropin-V), Group II (4-day Folltropin-V), Group III (5-day Stimufol), and Group IV (4-day Stimufol) were 12.17 ± 0.79 , 10.83 ± 0.60 , 9.67 ± 0.67 , and 8.83 ± 0.65 , respectively. The data indicate that Folltropin-V induced a significantly higher follicular response compared to Stimufol, with the extended 5-day Folltropin-V protocol demonstrating the most pronounced stimulation. On the day of embryo flushing, the mean number of corpora lutea recorded in Groups I through IV were 8.33 ± 0.71 , 7.16 ± 0.40 , 4.66 ± 0.49 , and 4.17 ± 0.48 , respectively. The higher CL count in Folltropin-treated groups underscores its superior luteotrophic efficacy over Stimufol, particularly under the 5-day administration schedule. The number of transferable embryos (Grades 1 and 2) recovered during embryo collection was also assessed. Group I (5-day Folltropin-V) yielded an average of 4.50 ± 0.22 viable embryos, followed by 4.00 ± 0.26 in Group II (4-day Folltropin-V), 3.00 ± 0.37 in Group III (5-day Stimufol), and 2.33 ± 0.33 in Group IV (4-day Stimufol). These findings corroborate the enhanced embryogenic potential of Folltropin-V, particularly when administered over a 5-day protocol. The results clearly demonstrate that Folltropin-V, especially in the 5-day treatment regimen, is more effective than Stimufol in eliciting a robust superovulatory response, as evidenced by greater follicular development, CL formation, and viable embryo yield in Sahiwal cows.

Table: Effect of exogenous gonadotropins on ovarian follicular development, corpora lutea (CL) formation, embryo yield

	Group I (5-day Folltropin-V),	Group II (4-day Folltropin-V),	Group III (5-day Stimufol)	Group IV (4-day Stimufol)
Follicular Development	12.17 ± 0.79,	10.83 ± 0.60 ,	9.67 ± 0.67 , and	8.83 ± 0.65
Corpora Lutea (CL) Formation	8.33 ± 0.71	7.16 ± 0.40	4.66 ± 0.49	4.17 ± 0.48

Embryo Yield	4.50 ± 0.22	4.00 ± 0.26	3.00 ± 0.37	2.33 ± 0.33
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Hormonal Profiles:

Serum cortisol concentrations exhibited a significant peak on Day 12/13 across all treatment groups when compared to Day 0, Day 9, and Day 20/21. This elevation is indicative of a physiological stress response or heightened metabolic activity associated with the peri-ovulatory phase. A significant increase ($P \leq 0.05$) in circulating estrogen levels was observed on Day 12/13 in all groups. This rise correlated with the concurrent increase in the number of ovulatory-sized follicles, reflecting the stimulatory effects of exogenous gonadotropin administration during the superovulatory window. Progesterone levels were significantly elevated ($P \leq 0.05$) on Day 20/21 in all treatment groups, consistent with the establishment of multiple functional corpora lutea post-ovulation. Comparatively, progesterone concentrations on Day 9 were significantly lower than those recorded on Day 20/21. On Days 0 and 12/13, progesterone levels remained below 1.0 ng/mL, reflecting baseline luteal activity or the luteolytic phase. Overall, Folltropin-V demonstrated superior superovulatory performance relative to Stimufol, as evidenced by enhanced ovulatory response and increased embryo yield. Although both the 4-day and 5-day Folltropin-V protocols yielded statistically comparable outcomes, the 5-day regimen consistently resulted in numerically higher values across all measured parameters, including follicular development, corpora lutea formation, and embryo recovery. This suggests a potential practical advantage for the 5-day Folltropin-V protocol in optimizing reproductive efficiency in bovine embryo transfer programs, particularly under field conditions.

Table: Hormonal Profiles During Super Ovulatory Protocol

Hormone	Day 0	Day 9	Day 12/13	Day 20/21
Cortisol	Baseline	No significant change	Significantly increased (all groups)	Returned to baseline or reduced
Estrogen	Baseline	Moderate	Significantly elevated ($P \leq 0.05$)	Decreased to basal
Progesterone	< 1.0 ng/mL	Significantly lower than day 20/21	< 1.0 ng/mL (low luteal activity)	Significantly elevated ($P \leq 0.05$) due to functional CL

Multiple Ovulation and Embryo Transfer (MOET) protocols were successfully standardized for four cattle breeds—Kankrej, Gir, Sahiwal, and Frieswal—by optimizing gonadotropin dosing and treatment schedules. Optimal superovulatory response was achieved using a total dose of 330 mg Folltropin-V, administered over a 5-day protocol in 10 divided and reducing doses. A total of 360 mg Folltropin-V delivered over 5 days in 10 tapering doses yielded the best ovarian response and embryo production outcomes. The most effective response in Sahiwal cows was observed with a 260 mg total dose of Folltropin-V using a 5-day, 10-dose decreasing schedule. Frieswal cows exhibited optimal superovulation and embryo recovery when treated with 400 mg of Folltropin-V, administered over a 4-day protocol in 8 divided and tapering

doses. These breed-specific dose optimizations highlight the importance of tailored superovulatory regimens for maximizing reproductive efficiency in MOET programs, considering breed physiology and endocrine responsiveness.

Table: Standardized MOET Protocols for Different Cattle Breeds

Breed	Total FSH Dose (Folltropin-V)	Protocol Duration	Dose Schedule	Response Summary
Kankrej	340 mg	5 days	10 reducing doses	Good follicular and luteal response
Gir	360 mg	5 days	10 reducing doses	Consistent superovulation
Sahiwal	260 mg	5 days	10 reducing doses	Effective response at lower dosage
Frieswal	400 mg	4 days	8 reducing divided doses	Optimal yield with shorter protocol

(III) Optimizing Viability-Based Approaches for skewing sex ratio in dairy cattle

Under this project, two studies were conducted to evaluate the potential of Resiquimod and Captopril in skewing the sex ratio and enhancing semen cryopreservation in Frieswal bulls. In the first study, Captopril was tested at concentrations of 5, 10, and 15 nM. The 10 nM group demonstrated the most favorable results, with improved progressive motility ($44.17 \pm 1.90\%$), viability ($51.00 \pm 0.97\%$), plasma membrane integrity ($45.00 \pm 1.00\%$), and acrosome integrity ($57.50 \pm 0.76\%$). DNA analysis showed enrichment of X-sperm in the upper layer, supported by increased MAOA band intensity and lower CT values in RT-PCR. These findings highlight Captopril's dual efficacy in enhancing semen preservation and serving as a cost-effective agent for sperm sex selection. In the second study, semen was treated with Resiquimod at concentrations of 0.2 μ M, 0.4 μ M, and 0.6 μ M. Among these, the 0.4 μ M group showed optimal results, with significant improvements in post-thaw sperm quality, including progressive motility ($46.67 \pm 0.76\%$), viability ($51.33 \pm 1.28\%$), plasma membrane integrity ($50.67 \pm 1.09\%$), and acrosome integrity ($59.33 \pm 0.71\%$). PCR and RT-PCR analyses confirmed enrichment of X-bearing sperm, with lower CT values and higher MAOA gene band intensity, indicating a favorable shift toward female-producing sperm.



Figure : Genomic DNA Extraction and X- & Y- skewing sex ratio validation by PCR & Real time PCR (qPCR)

- Agarose gel analysis of PCR product of X-sperm specific MAOA primers and Y-sperm-specific SRY with 5nM captopril for 60 minutes incubation
- Agarose gel analysis of PCR product of X-sperm specific MAOA primers and Y-sperm-specific SRY with 10nM captopril for 60 minutes incubation
- Agarose gel analysis of PCR product of X-sperm specific MAOA primers and Y-sperm-specific SRY with 15nM captopril for 60 minutes incubation

(IV) Biochemical constituents of blood and semen in relation to fertility attributes of Frieswal bulls

A total of 16 young Frieswal bulls (24–42 months) were selected based on semen donation and physical semen quality. All bulls donated semen across four seasons. Based on semen characteristics volume, color, consistency, sperm concentration, and initial motility eight bulls were categorized as good (G-I) and eight as poor (G-II). In G-I, average semen volume, sperm concentration, initial motility, and post-thaw motility were 5.38 ml, 1256.42 million/ml, 64.82%, and 43.18%, respectively, from 189 ejaculates. In G-II, respective values were 4.63 ml, 1197.40 million/ml, 52.76%, and 32.34% from 204 ejaculates; only seven bulls passed post-thaw quality. In G-I, live sperm averaged 78.44%, and abnormalities in head, mid-piece, tail were 3.46%, 4.48%, and 1.40%, with 76.30% intact acrosomes. In problem bulls, live sperm was 54.24%, with head, mid-piece, and tail abnormalities at 12.47%, 5.84%, and 3.20%, respectively

C. Improvement of cattle productivity through Nutrition and Management Approaches

(I) Quality augmentation of alternate feed resources through ensiling.

Preparation of silage (*in vitro*) from Wild guinea grass:

Wild guinea grass (*Megathyrus maximus*; WGG) is a weed and it spreads quickly along the roadsides (Photo 1).



Photo 1: Wild guinea grass

Additives like- mineral mixture (MM), maize flour (MF), jaggery powder (JP) and composite microbial mixture of Lactobacilli (LB) were used for making quality silage (*in vitro*) from WGG. Forage was chopped into pieces of 1-2cm. Additives i.e., mineral mixture (MM), maize flour (MF), jaggery powder (JP) and composite microbial suspension of Lactobacilli (1.5×10^6 CFU/100g fresh WGG; LAB) were used for making silage (*in vitro*) from WGG.



Photo 2: Chopped WGG and mixing of additives to the for silage preparation

WGG forage was chopped into pieces of 1-2cm. Additives i.e., mineral mixture (MM), maize flour (MF), jaggery powder (JP) and composite microbial suspension of Lactobacilli (1.5×10^6 CFU/100g fresh WGG; LAB) were used for making silage (*in vitro*) from WGG. 2.5 kg WGG was mixed with 50g DW (Control; T-1), 50g DW+5g MM (T-2), 50g DW+5g MM+15g MF (T-3), 50g DW+5g MM+15g JP (T-4), 5g MM +50ml LAB (T-5), and 50g DW+5g MM+7.5g JP+7.5g JP+50ml LAB (T-6). A 500g portion of each mixture was filled in tear-proof high density polythene bags in quadruples. After the removal of air, individual bags were sealed. These were placed under dark in polystyrene box for ensiling for 45 days. Samples were analysed as per standard procedures.



Photo 3: Appearance of silage prepared from chopped WGG - *in vitro*

Results (Table 1 and Fig 1) indicated a marginal improvement in silage quality on addition of MM (T-2) which was further improved on addition of MF&JP (T-3&T-4) because of better supply of fermentable energy and better microbial activity on addition of lactic acid bacteria T-5). However, best silage quality was produced with further addition of LAB being source of several species of lactic acid bacteria (T-6). With use of additives i.e., MM, MF, JP & LAB at respective levels of 0.2, 0.6, 0.6 g & 1.5×10^6 CFU per 100g WGG (fresh matter basis), good quality silage may be prepared.

Table 1. Nutrient composition of fresh WGG and silage (*in vitro*) under different treatments and fermentation parameters.

Attributes	WGG (initial) Treatments						WGG Silage (after 45d) Treatments					
	T-1	T-2	T-3	T-4	T-5	T-6	T-1	T-2	T-3	T-4	T-5	T-6
Nutrient (Average % DM basis, except DM)												
DM	25.78	26.11	26.26	26.42	26.04	26.37	23.43 ^{ab}	23.2 ^{ab}	22.95 ^a	23.09 ^{ab}	23.72 ^{ab}	24.15 ^b
CP	9.39	9.45	9.66	9.65	9.72	9.82	9.47	9.56	10.19	9.61	9.78	9.98
EE	1.77	1.78	1.91	1.72	1.8	1.83	1.57	1.72	1.83	1.56	1.59	1.61
CF	28.31	27.65	27.93	27.85	27.05	27.95	30.42 ^{cd}	30.05 ^{bc}	30.94 ^d	29.47 ^a	29.68 ^{ab}	30.82 ^d
NDF	72.42	73.04	72.86	72.46	73.37	72.86	69.47	68.9	69.91	71.06	69.99	70.13
ADF	39.85	41.18	39.18	38.68	37.1	39.48	41.06 ^{ab}	42.45 ^b	41.19 ^{ab}	39.98 ^a	40.86 ^{ab}	41.38 ^b
ASH	10.91	11.05	11.64	11.51	10.98	11.75	12.62	12.37	12.64	12.39	12.08	12.57
OM	89.09	88.95	88.36	88.49	89.02	88.25	87.38	87.63	87.36	87.61	87.92	87.43
NFE	49.62	50.07	48.86	49.27	50.46	48.64	45.92 ^{ab}	46.3 ^{ab}	44.4 ^a	46.97 ^b	46.86 ^b	45.02 ^{ab}
Silage fermentation parameters												
pH							4.61 ^d	4.53 ^d	4.32 ^b	4.06 ^a	4.42 ^c	4.09 ^a
Total N (% DM Basis)							1.52	1.53	1.63	1.54	1.57	1.6
Amm N (% DM Basis)							0.2 ^c	0.21 ^c	0.17 ^b	0.14 ^a	0.17 ^b	0.14 ^a
Ammonia N (% of TN)							13.27 ^c	13.79 ^c	10.37 ^b	9.17 ^a	10.68 ^b	8.9 ^a
Lactic Acid (g/100g DM)							4.62 ^a	4.46 ^a	5.23 ^b	6.13 ^c	6.84 ^d	7.53 ^c
LAB Count (x10 ⁵ /g DM)							2.06 ^a	2.15 ^{ab}	2.43 ^b	1.98 ^a	2.93 ^c	3.29 ^d

NB: Values bearing different superscripts in a row differ significantly (P<0.05)

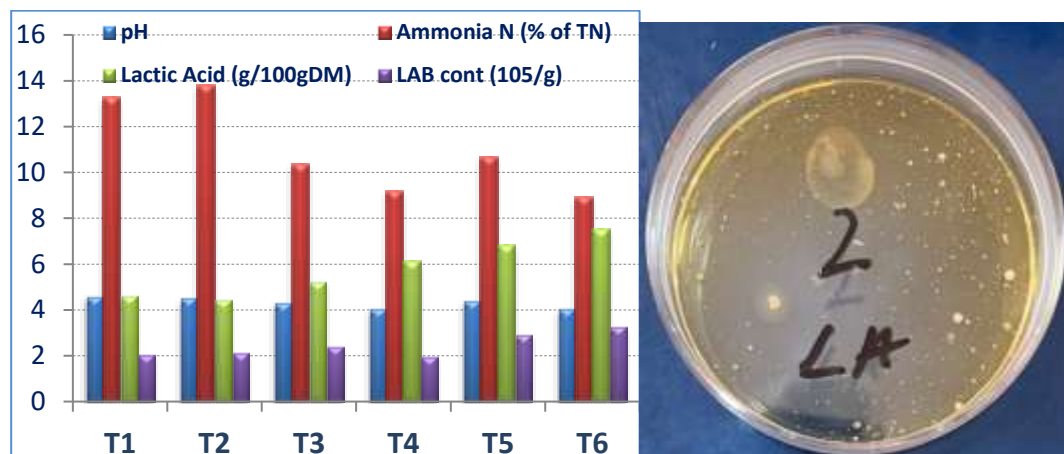


Fig.1: Fermentation characteristics (L) and plate showing growth of LAB colonies on MRS agar (R) from WGG silage (*in vitro*).

(II) Influence of dietary supplementation of botanicals on bull semen quality

a) Influence of dietary supplementation of botanicals on sexual performance and semen quality in Frieswal bulls.

Two groups of Frieswal breeding bull with 6-8 animals each were selected from the available stock at MGU. One group served as control (G-1; average BW 678±38.5 kg) while other

group served as treatment (G-2; average BW 687±18.4 kg). The experimental feeding was initiated during July 2024 and individual animal were orally fed (@100g/d) with a mixture of botanicals every day morning (at the time of concentrate feeding) for duration of 6 months. The semen from individual animal was collected as per the norms.

During the experimental feeding overall reaction time (sec) was improved from 47±2.0 in control to 44±2.0 in treatment group. Important semen quality parameters viz., ejaculate volume (ml), sperm concentration (x10⁶/ml), initial motility (%) and PTM (%) were also improved on supplemental feeding (Table.2)

Table 2. Semen quality parameters of Frieswal breeding bulls on supplemental feeding with a mixture of botanicals.

Attributes		Ejaculate Volume (ml)	Sperm Concentration (mil/ml)	Total Sperm (mil)	Initial Motility (%)	% PTM
GROUP						
G-1	Mean	5.26	1099.6	5685.4	59.7	37.6
n=71	SE	0.23	50.8	346.8	18.4	2.4
G-2	Mean	5.30	1511.3	7360.8	64.4	40.9
n=84	SE	0.19	103	337.6	19.6	1.3
Significance		ns	**	**	*	*
PERIOD						
Initial	Mean	5.43	1224.8	6702.9	62.9	36.7^{ab}
n=42	SE	0.25	67.8	475.7	1.5	3
1st Cycle	Mean	5.56	1384.4	7463.4	64.4	40.9^{ab}
n=36	SE	0.33	66.5	496.9	2	1.6
2nd Cycle	Mean	5.09	1193.2	5931.8	60.5	35.9^a
n=40	SE	0.31	75.6	507.8	2	2.9
3rd Cycle	Mean	5.05	1276.8	6337.5	61.4	45.0^b
n=37	SE	0.28	82.7	512.5	1.5	1.8
Significance		ns	ns	ns	ns	*
OVERALL	Mean	5.28	1266.1	6593.3	62.3	39.7
n=155	SE	0.15	36.8	250.7	0.9	1.2

NB: Values bearing different superscripts across a column differ significantly (* P<0.05; ** P<0.01)

b) Influence of dietary supplementation of botanicals on the blood plasma biochemical parameters in Frieswal breeding bulls.

The data on the blood plasma biochemical parameters viz., glucose, total protein, albumin, cholesterol, calcium and phosphorus has been depicted in table 3. The levels of parameters like-glucose and phosphorus were similar across the control (G-1) and treatment (G-2) groups. Moreover, the values of total protein, albumin, cholesterol and calcium were significantly higher

in treatment (G-2) group. The portrayal of such parameters, except calcium remained similar across the semen cycles on dietary supplementation of botanical mixture. Overall values of these blood plasma parameters remained under the normal physiological limits in both the groups and different sperm cycles.

Table 3. Blood plasma biochemical parameters of Frieswal breeding bulls on supplemental feeding with a mixture of botanicals.

Attributes		Glucose (mg/dl)	Total Protein (g/dl)	Albumin (g/dl)	Cholesterol (mg/dl)	Calcium (mg/dl)	Phosphorus (mg/dl)
		n=32	n=32	n=32	n=32	n=32	n=32
GROUP							
G-1	Mean	52.25	7.77	1.76	94.49	9.22	4.41
	SE	1.31	0.16	0.10	3.67	0.07	0.08
G-2	Mean	57.61	8.34	2.10	88.17	9.35	4.53
	SE	1.26	0.20	0.12	4.86	0.05	0.17
Significance		ns	**	**	*	*	ns
PERIOD							
Initial	Mean	51.59	7.23	1.36	86.42	9.13	4.47
	SE	0.98	0.22	0.10	4.30	0.09	0.15
1st Cycle	Mean	50.67	8.69	2.15	85.76	9.19	4.60
	SE	0.97	0.19	0.07	4.81	0.08	0.19
2nd Cycle	Mean	59.72	7.34	1.68	95.11	9.31	4.21
	SE	2.43	0.19	0.14	9.34	0.07	0.16
3rd Cycle	Mean	57.76	8.94	2.25	98.01	9.51	4.62
	SE	1.92	0.14	0.14	4.41	0.08	0.24
Significance		ns	ns	ns	ns	*	ns
OVERALL (n=155)	Mean	54.93	8.05	1.93	91.33	9.28	4.47
	SE	0.96	0.13	0.08	3.05	0.04	0.09

NB: Values bearing different superscripts across a column differ significantly (* P<0.05; ** P<0.01)

(III) Production of Omega-3 fatty acids enriched designed milk through feeding of microalgae derived from cattle effluents: waste to wealth approach

This project was initiated in coolobration with The Energy and Resource Institute (TERI) and microalgae were produced utilizing cattle effluents. The proximate compositions and fatty acid content of the microalgae (DM basis) were as below:

Proximate compositions:

Name	Percentage (%)	Name	Percentage (%)
Moisture	5.62	Ash	10.2
Crude Protein	42.5	Crude Fibre	9.15
Carbohydrate	12.46		
Fat	11.25		

Fatty acid content:

Fatty acid	Name	%
C _{14:0}	Myristic	2.10
C _{16:0}	Palmitic	53.60
C _{17:1}	Hepatadecanoic	14.84
C _{18:0}	Stearic	7.79
C _{18:1}	Oleic	6.74
C _{18:2}	Linoleic	5.54
C _{18:3}	Alpha linolenic	9.66
TSFA (total saturated fatty acids)	-	64.54
TUSFA (total unsaturated fatty acids)	-	35.46

A small-scale pilot study was conducted and data analysis is under progress. Initial results are encouraging.

(IV) Effect of Soy Lecithin on semen quality parameters and semen production in Frieswal Bulls

The aim of the project was to evaluate the effect of soy lecithin feeding on semen quality parameters, semen production and its effect on blood/ seminal plasma profile in Frieswal Bulls

	Initial				1 st Cycle			
	Vol. (ml)	Conc. (mil/ml)	IM (%)	PTM (%)	Vol. (ml)	Conc. (mil/ml)	IM (%)	PTM (%)
C	5.5 ± 0.4	1063.4 ± 98.7	60.0 ± 2.0	38.0 ± 8.0	5.3 ± 0.5	1369.4 ± 105.9	64.4 ± 2.2	40.0 ± 2.9
T	4.7 ± 0.3	1154.8 ± 110	62.3 ± 3.0	32.7 ± 2.7	4.7 ± 0.3	1326.7 ± 97.3	64.8 ± 2.2	41.8 ± 3.0
	NS	*	NS	*	NS	NS	NS	NS
	2 nd Cycle				3 rd Cycle			
	Vol. (ml)	Conc. (mil/ml)	IM (%)	PTM (%)	Vol. (ml)	Conc. (mil/ml)	IM (%)	PTM (%)
C	5.3 ± 0.5	1022.8 ± 92.4	56.5 ± 2.9	30.0 ± 5.2	4.9 ± 0.5	968.9 ± 90.7	58.8 ± 2.4	42.0 ± 3.7
T	4.3 ± 0.4	1264.7 ± 126.0	65.2 ± 2.5	46.2 ± 2.4	5.5 ± 0.4	1310.5 ± 103.3	68.9 ± 2.1	42.3 ± 2.3
	NS	*	**	*	NS	**	**	NS

During first feeding experiment some improvement was observed in seminal parameters. Semen vol., concentration, initial motility and post thaw motility was significantly improved in 2nd and 3rd cycle among the treated group. Second feeding experiment is in under progress.

(V) Evaluating bull breeding soundness using machine learning tools

Frieswal and Sahiwal bulls under semen collection were selected to predict the breeding soundness of bulls from their physical condition, behaviour, and semen characteristics using machine learning techniques. Observations on Breeding Soundness (scrotal circumference, body condition, scrotal skin thickness, etc.) and about 10 images from each bull were taken for further

analysis. The semen ejaculates collected twice a week from these bulls were evaluated for their quality and were processed for cryopreservation.



Fig: Recording of observations on bulls

Breeding soundness was performed for the bull calves received at MGU and at the age of first semen collection. The research experiments of scientists belonging to CGB, CNM and CPR divisions were conducted on semen donating Frieswal bulls.

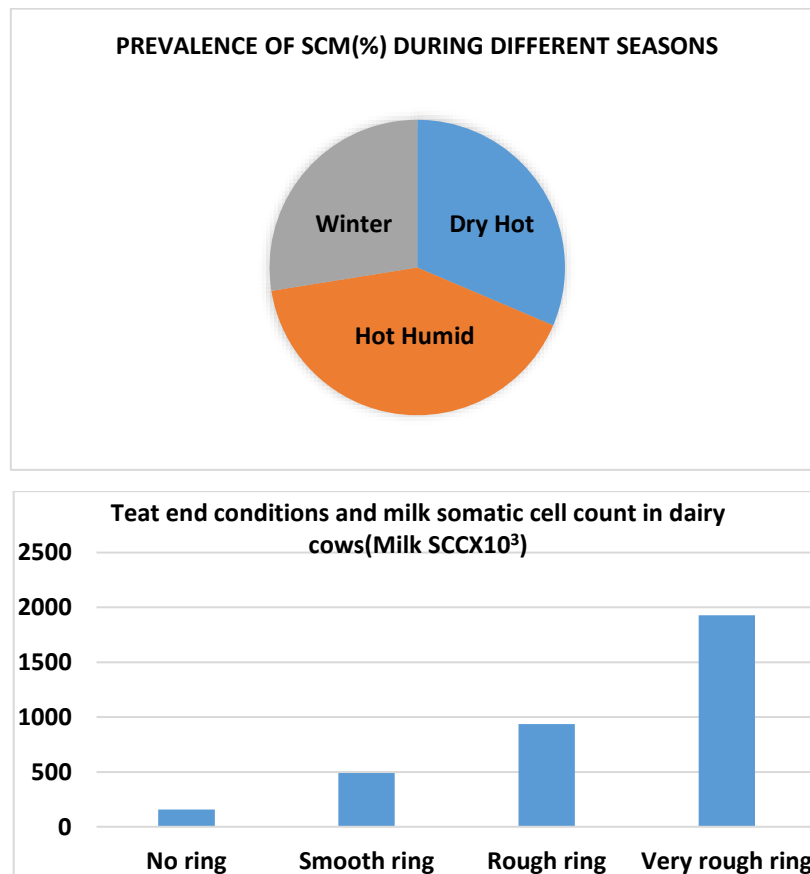
(VI) Assessment of subclinical mastitis and development of therapeutics for its management in cattle

The study was conducted on Frieswal dairy cows maintained at the organized dairy farm of ICAR-National Dairy Research Institute (NDRI), Karnal. Individual animal parameters, including age, parity, milk yield, lactation stage, and season, were systematically recorded. Screening for subclinical mastitis (SCM) was performed using the California Mastitis Test (CMT). Thermal images of individual udder quarters were captured using an infrared thermographic camera positioned at a standardized distance from both lateral and caudal perspectives of the udder. Additionally, approximately 20 ml of quarter foremilk was aseptically collected in sterile tubes for further analysis. Out of 152 lactating cows screened, 75 animals (49.3%) were found to be positive for SCM in one or more udder quarters. The incidence of SCM was notably higher in cows of 1st to 3rd parity, during early lactation stages, and among high-producing individuals. A total of 30.92% of udder quarters were affected, with hind quarters showing a higher frequency of infection. Seasonal variation was evident, with the highest prevalence of SCM recorded during the hot-humid period, followed by dry-hot and winter seasons.

Teats exhibiting rough or very rough rings at the teat sphincter showed significantly elevated somatic cell counts ($\text{SCC} \times 10^3$) compared to those with smooth or no rings. Infected milk samples demonstrated elevated SCC, electrical conductivity, and salt concentrations, whereas milk from healthy quarters had higher levels of fat, protein, lactose, and solids-not-fat (SNF). Infrared thermography revealed significantly higher udder surface temperatures (UST) in mastitis-affected quarters compared to healthy ones. The temperature differential ranged from 0.9°C to 2.0°C across different CMT scores. During the summer, udder skin surface temperature (USST) ranged from 36.7°C to 38.7°C, whereas in the winter season, it ranged from 34.1°C to 35.4°C, indicating the sensitivity of thermographic assessment to seasonal changes and udder health status. Antibioqram

analysis showed that **gentamicin**, **chloramphenicol**, **ciprofloxacin**, and **ceftriaxone** exhibited high efficacy against mastitis-causing organisms. Moderate sensitivity was observed for **penicillin**, **ampicillin**, **tetracycline**, and **streptomycin**. Notably, *Streptococcus spp.* exhibited resistance to tetracycline, while *E. coli* strains were resistant to streptomycin and ampicillin.

Subclinical mastitis was more frequently observed in cows of lower parity, early lactation, and in high milk yielders, particularly affecting hind teats. Infrared thermography proved to be a valuable, non-invasive diagnostic tool for early detection of SCM. Among tested antimicrobials, gentamicin, chloramphenicol, ciprofloxacin, and ceftriaxone demonstrated superior in vitro efficacy against isolated mastitis pathogens, supporting their potential utility in therapeutic protocols.



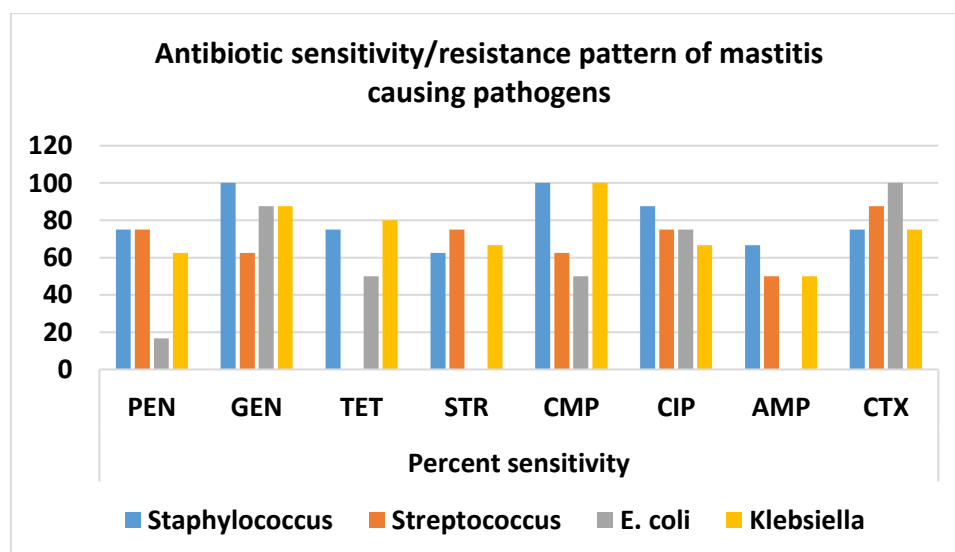
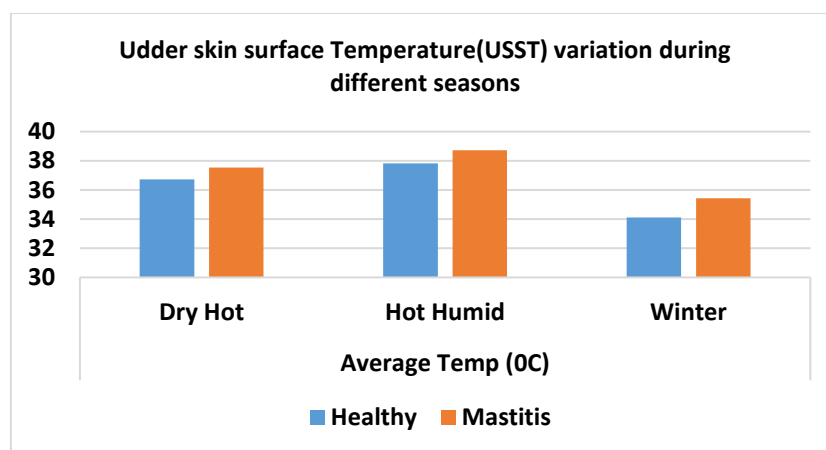


Table: Antibigram of the isolated organisms from milk samples

PEN-Penicillin, GEN- Gentamicin, TET- Tetracycline, STR- Streptomycin, CMP- Chloramphenicol, CIP- Ciprofloxacin, AMP- Ampicillin, CTX- Ceftriaxone

(VII) Evaluation of Herbo-Mineral Supplementation for Amelioration of Immuno-metabolic and Oxidative Stress in Transitional Cow

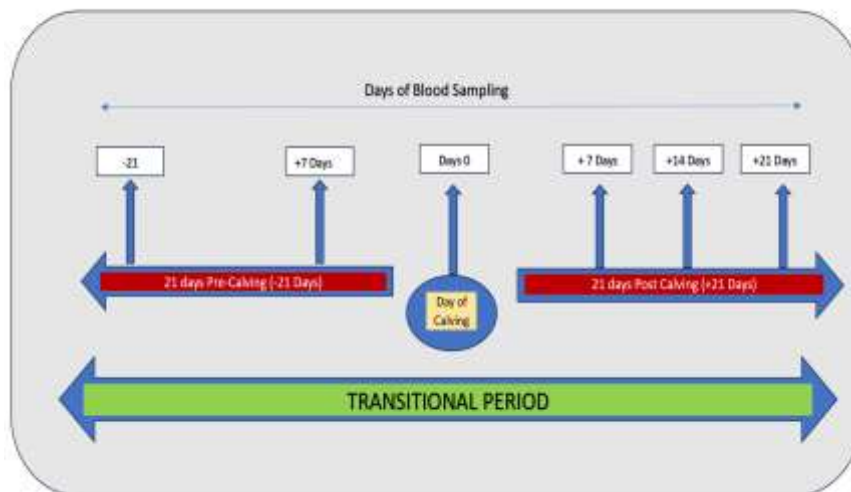
Three distinct herbo-mineral formulations were developed using selected medicinal plants and a common mineral mixture. The plant species incorporated into the formulations included *Asparagus racemosus*, *Withania somnifera*, *Glycyrrhiza glabra*, *Phyllanthus niruri*, *Tephrosia purpurea*, *Phyllanthus emblica*, *Linum usitatissimum*, *Trachyspermum ammi*, *Trigonella foenum-graecum*, *Zingiber officinale*, *Cuminum cyminum*, and *Foeniculum vulgare*. Various parts of these botanicals were shade-dried, finely powdered, and blended in differing proportions to yield three experimental herbo-mineral formulations. A standardized mineral premix containing essential macro- and micro-elements such as calcium, phosphorus, potassium, magnesium, iron, zinc, copper, cobalt, iodine, and sulphur was uniformly incorporated into each of the three formulations to ensure mineral adequacy. The feeding trial was conducted at the Livestock Research Centre

(LRC), Sardar Vallabhbhai Patel University of Agriculture and Technology, Modipuram. A total of 72 blood samples were collected from 12 experimental animals throughout the transition period to assess the physiological and metabolic impact of the herbo-mineral supplementation. Blood samples were collected at six critical time points corresponding to different phases of the transition period viz: Day -21 (pre-calving), Day -7 (pre-calving), Day 0 (day of calving), Day +7 (post-calving), Day +14 (post-calving), Day +21 (post-calving). All blood samples were preserved at -20°C for subsequent biochemical and haematological analyses.

Table:

S. No.	Group (No. of Animals)	Status of Animal	Treatment
1.	Group 1 (N=6)	Transitional period	Animals were fed with Herbo-Mineral Mixture (Formulation 001) 100 gm daily from -21days prior to calving to +14 days' post calving.
2.	Group 2 (N=6)	Transitional period	No treatment

Fig 1:
collection
during
period



**Days of blood
from animals
transitional**

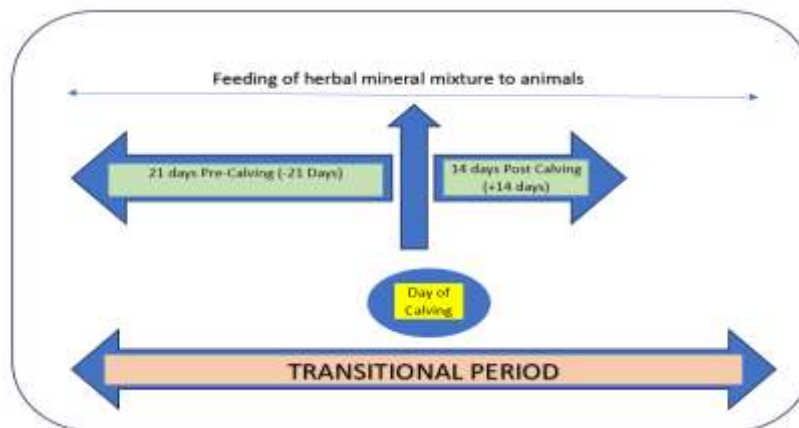


Fig 2: Days on which Herbo-mineral mixture was fed to animals

(VIII) Investigation of Heat stress impact on Frieswal cattle and enhancement of their thermotolerance through HSP40 gene modulation

Sixteen animals ($n = 8$ per group) were selected based on uniformity in body weight and age. These animals were divided into two groups and housed under two different shed conditions. One group was kept in a modified shed equipped with fans and foggers to maintain a cooler ambient environment, while the other group was maintained in a conventional shed to serve as the heat-stressed control. Recording of physiological parameters such as rectal temperature, respiration rate, and heart were made along with the blood sampling for subsequent biochemical and molecular analyses. A significant increase ($p < 0.05$) in Rectal temperature, Respiration rate, AST, ALT and Creatinine was observed in the heat stress group compared to the control group.

D. Economics of Cattle Husbandry

(I) Comparative Performance of Indigenous vis-a-vis Crossbred Cattle at Commercial Dairy Farms

A field-based study was conducted on commercial dairy herds located across five districts—Muzaffarnagar, Meerut, Baghpat, Moradabad, and Ghaziabad—to compare the productive, reproductive, and economic performance of indigenous versus crossbred cattle. The primary objective was to assess the economic viability and management efficiency of both cattle types under practical farming conditions. The study revealed that the daily expenditure on maintaining dairy herds varied widely across districts, with the total herd-level costs ranging from ₹7,546.29 in Moradabad to ₹14,250.77 in Ghaziabad. Major cost components included green and dry fodder, concentrates, labour, veterinary services, and depreciation on animals, equipment, and infrastructure. Daily per-animal expenditures were calculated as ₹307.08 in Muzaffarnagar, ₹321.03 in Meerut, ₹391.30 in Baghpat, ₹279.16 in Moradabad, and ₹427.80 in Ghaziabad. These variations reflected differences in herd sizes, input usage patterns, and regional cost structures.

With respect to milk production economics in crossbred cows, the average cost of production was ₹43.15 per litre across all locations. District-wise, this ranged from ₹37.18 in Moradabad to ₹54.44 in Meerut. Correspondingly, the average sale price was ₹49.21 per litre, ranging from ₹40.00 in Moradabad to ₹57.50 in Ghaziabad. The net return per litre of milk was found to be ₹4.89 overall, with Ghaziabad reporting the highest return of ₹10.00 per litre and Moradabad the lowest at ₹2.82 per litre. In contrast, milk production from indigenous cows showed an average cost of ₹43.12 per litre. District-wise costs were highest in Moradabad (₹46.37) and lowest in Meerut (₹36.63). The sale price, however, was more favourable, averaging ₹59.67 per litre, with Meerut achieving a premium price of ₹85.00. This resulted in an overall average profit margin of ₹5.88 per litre. Notably, dairies in Moradabad reported a negative return of ₹-2.37 per litre, attributed to higher production costs and lower market prices.

Reproductive and productive parameters were also evaluated. Among indigenous cattle, the average parity was 3.23 ± 0.10 , with Moradabad reporting the highest parity at 3.46 ± 0.41 . Average milk yield was 7.43 ± 0.18 kg/day, with the highest yield observed in Meerut (8.20 ± 0.39 kg/day). The average age at first calving (AFC) across districts was 41.89 ± 0.42 months, highest in Moradabad (42.55 ± 1.60 months), likely due to suboptimal management practices. However, statistical analysis revealed that differences in indigenous cattle performance across districts were

not significant. For crossbred cattle, performance metrics indicated an overall parity of 2.95 ± 0.06 . District-wise parity ranged from 2.86 ± 0.12 in Meerut to 3.00 ± 0.25 in Moradabad and Baghpat. The overall average daily milk yield in crossbreds was 11.30 ± 0.19 kg, with the highest yields in Muzaffarnagar (11.90 ± 0.43 kg) and Meerut (11.71 ± 0.36 kg). The average AFC among crossbreds was significantly lower at 23.99 ± 0.09 months, reflecting the impact of improved genetic potential and management. Significant differences in AFC were observed across districts, with Moradabad again showing the highest AFC (25.55 ± 0.27 months).

Analysis of health and reproductive disorders in crossbred cattle revealed that repeat breeding was the most prevalent issue (33.57%), followed by anoestrus (21.74%), metritis (8.83%), and retained placenta (2.72%). Additionally, diseases such as foot-and-mouth disease (FMD) and mastitis were observed in several herds, although most farmers were reported to follow regular vaccination and deworming schedules. The study also calculated the Standard Animal Unit (SAU) across districts, with Ghaziabad having the highest at 45.48, followed by Meerut (32.89), Moradabad (27.57), Baghpat (24.18), and Muzaffarnagar (17.78). These values correspond to the size and productivity levels of the dairy herds in each district.

In conclusion, the study underscores that both indigenous and crossbred cattle have their relative strengths and economic implications under commercial dairy farm conditions. Crossbred cattle demonstrated superior milk productivity and earlier calving age, whereas indigenous cows, while yielding slightly less, fetched higher prices for their milk, particularly in local and niche markets. Economic viability was also influenced by location-specific factors such as feed costs, labour availability, and market access. The findings of this study offer valuable insights for optimizing herd composition and resource allocation in commercial dairy enterprises, and hold relevance for policy planning and support programs aimed at improving dairy productivity and profitability in the region.

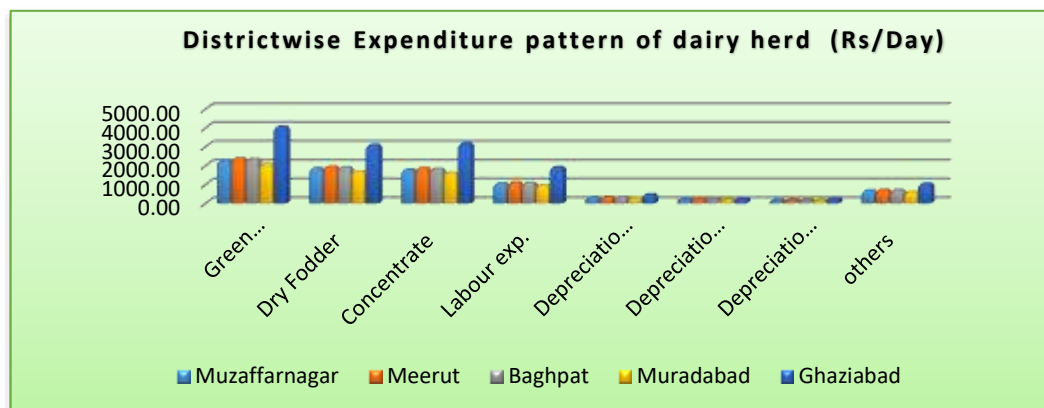


Fig : District-wise Expenditure pattern of a dairy herd (Rs/Day)

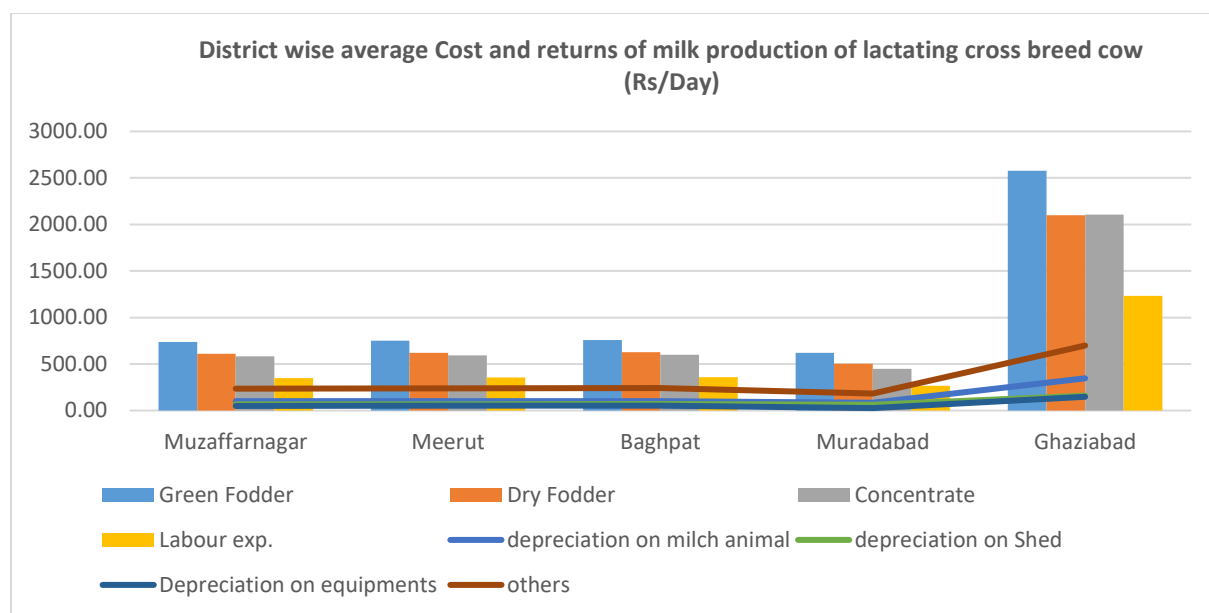


Fig 2: District-wise average cost and return of milk production of lactating crossbred cows (Rs/Day)

Table 2 District-wise Cost and returns of milk production of lactating cross-breed cow (Rs/Day)

S N	Particulars	Muzaffarnagar		Meerut		Baghpat		Moradabad		Ghaziabad		Overall Average
		Average	%	Average	%	Average	%	Average	%	Average	%	
1	Green Fodder	737.49	27.30	750.32	27.02	756.73	27.00	621.85	28.56	2577.32	27.41	1088.74
2	Dry Fodder	609.62	22.41	620.22	22.50	625.53	22.49	504.15	23.16	2100.34	21.50	891.97
3	Concentrate	582.72	21.51	592.86	21.49	597.92	21.00	448.40	20.60	2104.52	22.40	865.29
4	Mineral Mixture	35.37	1.29	35.98	1.30	36.29	1.28	26.46	1.25	119.12	1.27	50.64
5	Veterinary Exp.	29.85	1.00	30.37	1.10	30.63	1.20	22.29	1.25	77.56	0.82	38.14
6	Insurance cost	0.00	0.00	0.00	0.00	0.00	0.30	8.75	0.40	0.00	0.00	1.75
7	Labour exp.	348.57	12.90	354.63	12.70	357.66	12.69	266.08	12.22	1230.93	13.50	511.57
8	Miscellaneous exp.	20.97	0.77	21.33	0.77	21.51	0.77	15.03	0.69	70.08	0.75	29.79
9	Interest on milch animal	58.54	2.36	59.56	2.16	60.07	2.20	49.11	2.26	203.55	2.16	86.16
10	Depreciation on milch animals	99.59	3.70	101.32	3.65	102.19	3.80	83.58	3.90	346.16	3.68	146.57
11	Interest on shed/building	44.47	1.66	45.24	1.63	45.63	1.70	41.53	1.91	120.37	1.28	59.45
12	Depreciation on the Shed	66.79	2.52	67.95	2.45	68.53	2.51	62.16	2.86	159.94	1.70	85.07
13	Interest on equipment	36.85	1.70	37.49	1.45	37.81	1.34	19.18	0.88	107.96	1.15	47.86
14	Depreciation on equipment	50.51	1.82	51.39	1.86	51.82	1.90	26.33	1.21	147.75	1.57	65.56
15	Total expenditure	2729.37		2776.84		2800.58		2194.90		9402.68		3980.87
16	Value of dung	20.70		21.06		21.24		17.75		72.17		30.58
17	Net cost (15-16)	2708.67	100.0	2755.78	100.0	2779.34	100.0	2177.15	100.0	9330.51		3950.29
18	milk production per day	72.45		78.39		74.34		59.25		199.50		96.79
19	Per litre cost of production	44.58		42.13		44.38		37.18		47.50		43.15

20	sales price per litre	46.46		54.44		47.67		40.00		57.50		49.21
21	profit/loss	3.21		5.14		3.29		2.82		10.00		4.89

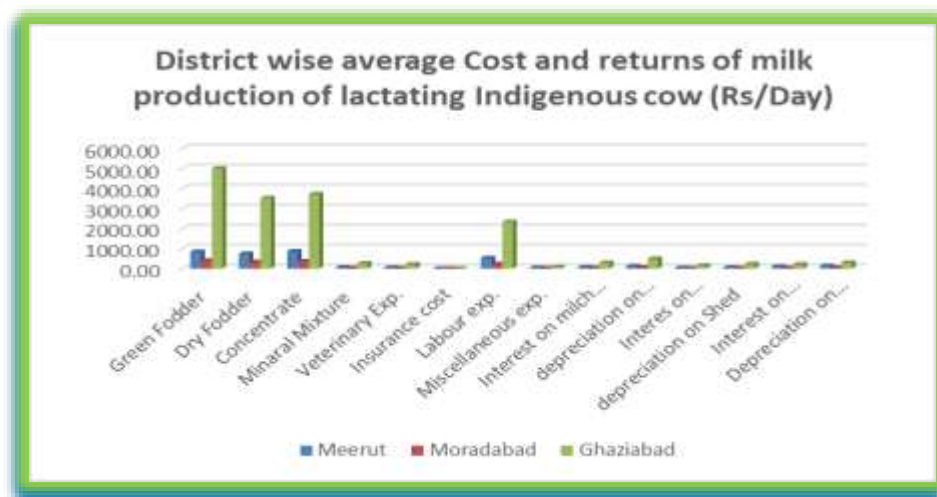


Fig 3: District-wise average cost and return of milk production of lactating Indigenous cows (Rs/Day)

Table 5: Comparison of the performances of crossbred cattle among districts

Districts	Number of Animals (N)	Parity order (Mean $\pm$ SE)	Milk yield (Mean $\pm$ SE)	AFC (Mean $\pm$ SE)
Baghpat	94	3.00 $\pm$ 0.13	10.97 $\pm$ 0.38	24.36 $\pm$ 0.15 ^b
Meerut	98	2.86 $\pm$ 0.12	11.71 $\pm$ 0.36	24.15 $\pm$ 0.15 ^b
Ghaziabad	83	2.98 $\pm$ 0.14	10.85 $\pm$ 0.38	23.84 $\pm$ 0.17 ^b
Muzaffarnagar	70	2.96 $\pm$ 0.14	11.90 $\pm$ 0.43	22.91 $\pm$ 0.19 ^a
Moradabad	22	3.00 $\pm$ 0.25	10.69 $\pm$ 0.66	25.55 $\pm$ 0.27 ^c
Total	367	2.95 $\pm$ 0.06	11.30 $\pm$ 0.19	23.99 $\pm$ 0.09

Means with different superscripts ^(a,b,c) differ significantly

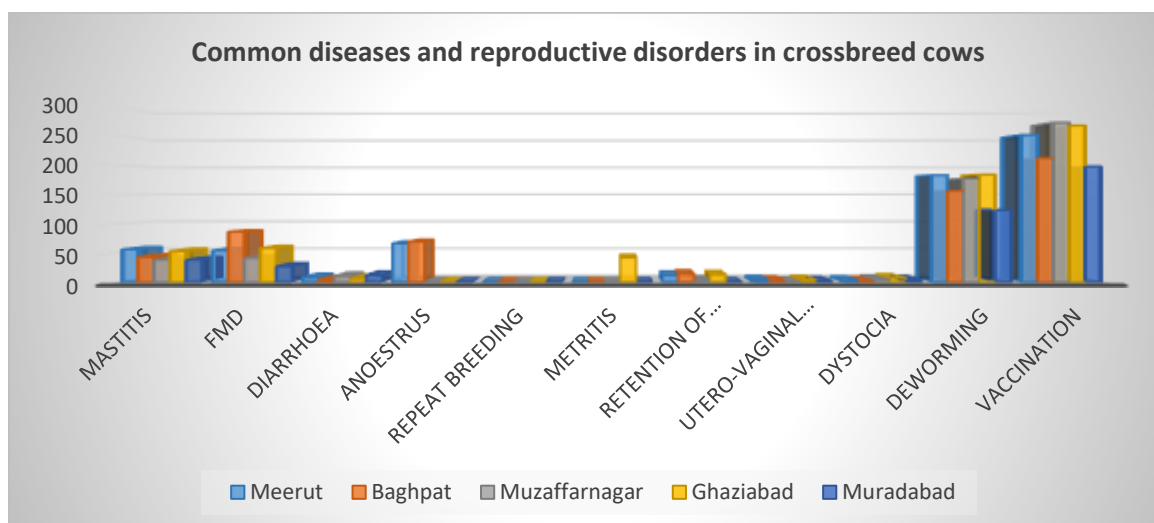


Fig 4. Common diseases and reproductive disorders in crossbreed cows

(II) Development of dung-based bio- briquettes as solid fuel source

The process of biomass briquette production using cattle dung was optimized to improve its combustion efficiency and suitability as a renewable solid fuel. To enhance the calorific value of the briquettes, the incorporation of sugarcane bagasse was standardized, with 10% inclusion found to be optimal. Conversely, the direct addition of flower waste negatively impacted the drying kinetics of the briquettes and was therefore deemed unsuitable for use in the formulation. A combination of chemical additives comprising potassium nitrate (KNO_3), manganese dioxide (MnO_2), citric acid, and glycerine was identified as an effective combustion promoter, while a mixture of aluminium hydroxide and ammonium molybdate demonstrated efficacy as a smoke suppressant. In addition, calcium oxide (CaO) was validated as an effective desulfurizing agent. The optimal inclusion rates for these additives were determined (specific levels under intellectual property rights protection). The incorporation of these chemical additives significantly improved the energy output of the briquettes, with calorific values increasing approximately 2.5 to 3 times compared to conventional dung cakes. Analytical comparison between treated and untreated (control) briquettes showed that moisture content, volatile matter, and fixed carbon were marginally higher in the treatment group, whereas the ash content was also elevated due to additive incorporation. These findings suggest that optimized dung-based briquettes, supplemented with appropriate additives, can serve as an efficient and environmentally improved solid biofuel alternative.

(III) Analysis of differences in food values of milk from Frieswal, Sahiwal and Tharparkar

The primary objective of the project was to examine variations in the major and minor constituents of milk from Frieswal, Sahiwal, and Tharparkar cattle breeds and their impact on nutritional value. Daily milk analysis using Lacto-scan revealed significant breed-specific differences in key milk components. Indigenous breeds showed notably higher levels of fat, SNF, protein, lactose, and salt content compared to Frieswal. Among the indigenous breeds, Sahiwal milk contained higher values of these components than Tharparkar. Minor variations were observed in pH and electrical conductivity. Overall, fat percentages were uniformly low across all three breeds, indicating the need to revise feeding strategies. The project also aims to explore differences in metabolite and protein profiles among these cattle breeds.

(IV) Economics of dairy cattle farming in Uttar Pradesh

A structured field survey was conducted to analyze dairy farming systems in four purposively selected districts of Uttar Pradesh—Saharanpur, Bijnor, Azamgarh, and Prayagraj. These districts were chosen based on the presence and distribution of both crossbred and indigenous breeds of dairy cattle. Data were collected through a pre-tested and standardized proforma by interviewing 320 dairy farmers, with 20 farmers selected from each of the 16 surveyed villages. The information gathered covered a wide range of parameters, including socio-economic characteristics of the farmers, livestock and farm inventories, monthly recurring expenses, milk production and utilization patterns, feed and fodder expenditure, labor involvement, milk marketing and processing activities, household consumption of milk and milk products, animal productivity indicators, and revenue generated from milk and livestock sales. To facilitate comparative analysis, livestock holdings were standardized into Standard Animal Units (SAUs) as per the classification recommended for the northern region of India by Sirohi et al. (2015).

Based on herd size, dairy households were grouped into three categories: small (1–3 milch animals), medium (4–6 milch animals), and large (more than 6 milch animals). The survey revealed that the majority of households (71.56%) belonged to the small herd category, followed by medium (25%) and large (3.44%) herd categories. The average milch SAUs per household were 1.73, 3.74, and 9.93 for small, medium, and large herd households respectively, while the overall average stood at 2.51 milch SAUs per household. An analysis of the composition and herd size of dairy cattle revealed that a total of 468 indigenous and 525 crossbred cattle were maintained across surveyed households. In both breed categories, adult lactating animals constituted the largest proportion of the herd. Among indigenous cattle, 44.23% were lactating, and in crossbred cattle, the corresponding figure was 48.58%. The overall average herd size was 3.10 SAUs per household, with large herd households maintaining an average of 12.09 SAUs, medium herds 4.47 SAUs, and small herds 2.19 SAUs. With respect to milch animals, the average number was highest in large herd households at 7.00 milch SAUs per household, followed by medium (2.80) and small (1.32), resulting in an overall mean of 1.89 milch SAUs per household.

Milk productivity per animal is a crucial factor influencing the profitability of dairy farming. In the study area, crossbred cattle exhibited significantly higher milk yield, averaging 8.26 litres per animal per day, compared to 4.86 litres for indigenous cattle. At the household level, average daily milk production was highest among crossbred cattle (26.93 litres per day) and lower in indigenous cattle (11.88 litres per day), with an overall average of 19.40 litres per household per day. Large herd households contributed the most to milk production, averaging 39.00 litres per day, while medium and small herd households produced 14.43 and 4.79 litres per day respectively.

The marketing of milk among the surveyed households showed a high level of commercialization. On average, 16.52 litres of milk were marketed daily per household, representing 89.78% of total production. Households in the large herd category marketed the most milk (33.64 litres/day), followed by medium (12.63 litres/day) and small (3.29 litres/day) herd households. The average household consumption of milk was 1.88 litres per day, while milk losses during handling and milking were minimal at 0.07 litres per day. The utilization pattern remained consistent across herd size categories, with larger households both producing and marketing higher quantities of milk.

In terms of economics, the cost of milk production was analysed separately for indigenous and crossbred cattle. For indigenous cattle, the average gross cost of milk production was estimated at Rs.192.75 per animal per day, comprising 94.16% variable cost and 5.84% fixed cost. Among variable costs, feed and fodder expenses constituted the largest share (69.06%), followed by labor (23.57%) and veterinary and miscellaneous expenses (1.53%). After accounting for dung value, the net cost was Rs.177.84 per animal per day. The average milk yield was 4.86 litres per animal per day, and the average price received for milk was Rs.40.88 per litre. This resulted in a gross return of Rs.213.24 and a net return of Rs.35.41 per animal per day. The cost of milk production per litre was Rs.36.66, with net returns per litre at Rs.7.57.

For crossbred cattle, the average gross cost of milk production was higher at Rs.249.86 per animal per day, with variable costs accounting for 92.27% and fixed costs for 7.73%. Feed and fodder again made up the largest share of the cost structure at 72.86%, followed by labor (17.45%) and veterinary/miscellaneous expenses (1.96%). The net cost, after subtracting dung value, was Rs.234.36 per animal per day. With a higher milk yield of 8.26 litres per animal per day and an average milk price of Rs.36.32 per litre, the gross return was Rs.315.56 per animal per day. Net return amounted to Rs.81.20 per animal per day. The cost of milk production per litre was lower

at Rs.28.37, and net return per litre was higher at Rs.9.83, indicating better profitability from crossbred cattle compared to indigenous cattle.

A comparative evaluation revealed that while the cost of production per litre was higher for indigenous cattle (Rs.36.66) than for crossbred cattle (Rs.28.37), the milk price obtained for indigenous milk was also higher (Rs.40.88 vs. Rs.36.32), largely due to higher fat content. However, due to significantly higher milk yield in crossbreds, net returns per animal and per litre were higher for crossbred cattle (Rs.81.20 and Rs.9.83) compared to indigenous cattle (Rs.35.41 and Rs.7.57). The overall average milk yield was 6.56 litres per animal per day, and the average gross return across both cattle types was Rs.268.41 per animal per day. Regression analysis of resource use efficiency indicated that for indigenous cattle, dry fodder and concentrate feed had a statistically significant positive impact on milk production. For crossbred cattle, concentrate feed was the only input with a significant effect. This highlights the importance of nutritional management, particularly the use of concentrate feed, in improving milk yield and overall dairy productivity.

In conclusion, the study confirmed that crossbred cattle contributed a larger share to total milk production (69.38%) compared to indigenous cattle (30.61%), primarily due to their superior genetic potential for milk yield. Net returns from milk production were significantly higher in crossbred cattle, making them a preferred choice among farmers in the study area. The results also underscore the importance of feed management, with dry fodder and concentrate playing critical roles in determining milk output, especially in indigenous cattle. Enhancing the supply and quality of feed resources, along with strategic breeding and animal healthcare, can substantially improve the productivity and profitability of dairy farming in Uttar Pradesh.

Table 1: Distribution of households based on dairy cattle stock (Number of households, N=320)

Particulars	Dairy Cattle			Overall
	Small (1-3 animals)	Medium (4-6 animals)	Large (Above 6 animals)	
Number of Household	229 (71.56)	80 (25.00)	11 (03.44)	320 (100)
SAUs per household (Average)	1.73	3.74	9.93	2.51

Figures in the parenthesis indicate the percentage of households' distribution in different categories

Table 2: Composition and herd size of dairy cattle stock maintained by households

Type of animals	households			
	Small	Medium	Large	Overall
Indigenous Cattle				
Young stock	81 (29.03)	38 (28.57)	7 (12.50)	126 (26.92)
Heifers	29 (10.39)	11 (8.27)	21 (37.50)	61 (13.03)
Adult in milk	119 (42.65)	66 (49.62)	22 (39.28)	207 (44.23)
Adult in dry	50 (17.93)	18 (13.54)	6 (10.72)	74 (15.82)
Total	279 (100)	133 (100)	56 (100)	468 (100)
Crossbred Cattle				
Young stock	76 (34.08)	68 (30.23)	16 (20.78)	160 (30.48)
Heifers	12 (05.38)	17 (07.55)	12 (15.58)	41 (07.80)
Adult in milk	108 (48.44)	112 (49.78)	35 (45.46)	255 (48.58)

Adult in dry	27 (12.10)	28 (12.44)	14 (18.18)	69 (13.14)
Total	223 (100)	225 (100)	77 (100)	525 (100)
Milch cattle per household	1.32	2.80	7.00	1.89
Herd size of cattle per household	2.19	4.47	12.09	3.10

Table 4. Milk production of dairy cattle by households (litres/day/household)

Particulars	Small	Medium	Large	Overall
Indigenous	3.48	10.16	22.00	11.88 (30.61) *
Crossbred	6.11	18.70	56.00	26.93 (69.38) *
Overall	4.79 (08.22) **	14.43 (24.79) **	39.00 (66.99) **	19.40

*Figures in the parenthesis indicate the contribution of different breed in total milk production

**Figures in the parenthesis indicate the share of households in total milk production

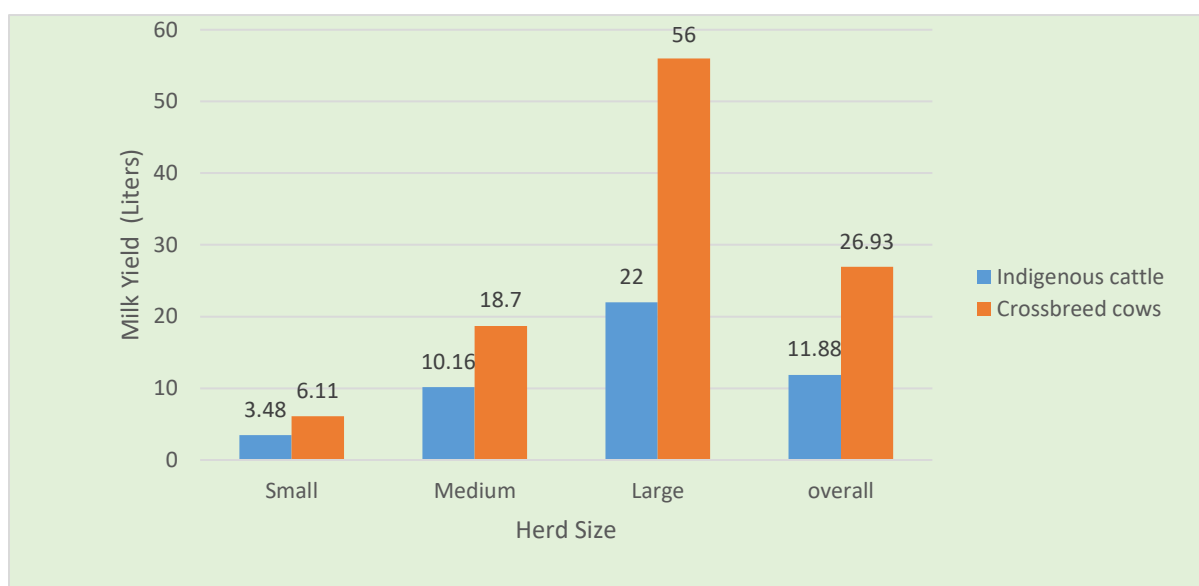


Table 5. Milk marketed by producer households (litres/day/household)

Category of households	Milk production per household	Milk consumption per household	Marketed surplus
Small	4.79	1.50 (31.32)	3.29 (68.68)
Medium	14.43	1.80 (12.48)	12.63 (87.52)
Large	36.00	2.36 (06.56)	33.64 (93.44)
Overall	18.40	1.88 (10.22)	16.52 (89.78)

Figures in the parenthesis indicate the percentage of marketed surplus

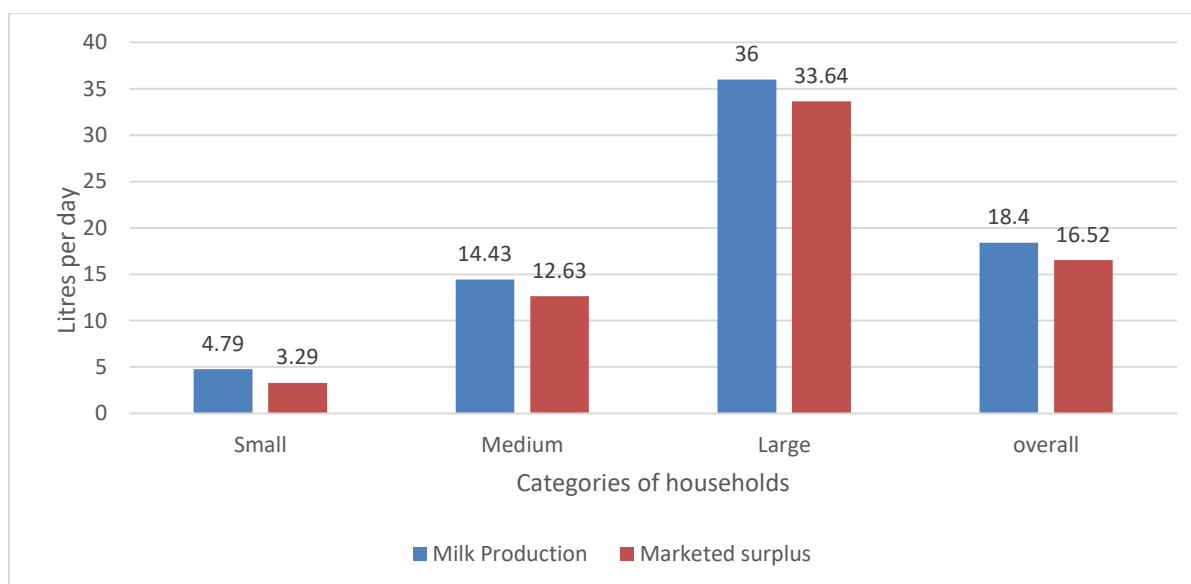


Table 6. Utilization pattern of milk production at the household (liters/day/household)

Particulars	Small	Medium	Large	Overall
Milk production	4.79	14.43	36.00	18.40
Milk sold	3.26 (68.05)	12.56 (87.04)	33.53 (93.14)	16.45 (89.40)
Losses	0.03 (00.63)	0.07 (00.48)	0.11 (00.30)	0.07 (00.38)
Milk retained at home	1.50 (31.32)	1.80 (12.48)	2.36 (06.56)	1.88 (10.22)

Figures in the parenthesis indicate the percentage to columns the total milk production

Table 7. Cost and returns of milk production of indigenous cattle by households (Rs./Animal/ Day)

Cost and Returns components	Small	Medium	Large	Overall
Green fodder (F1)	45.46 (30.86)	62.33 (31.11)	80.36 (34.84)	62.71 (32.53)
Dry fodder (F2)	14.93 (10.13)	35.66 (17.80)	34.80 (15.08)	28.46 (14.76)
Concentrate(F3)	32.75 (22.23)	38.31 (19.12)	54.89 (23.79)	41.98 (21.77)
Feed and fodder cost V1 (F1+F2+F3)	93.14 (63.23)	136.30 (68.04)	170.05 (73.73)	133.16 (69.06)
Labour Cost (V2)	37.21 (25.26)	47.01 (23.47)	52.17 (22.62)	45.46 (23.57)
Veterinary & Miscellaneous cost (V3)	02.70 (01.84)	03.14 (01.57)	02.81 (01.22)	02.88 (01.53)
Total Variable Cost (V1+V2+V3)	133.05 (90.33)	186.45 (93.08)	225.03 (97.57)	181.51 (94.16)
Total Fixed Cost (TFC)	14.25 (9.67)	13.86 (6.92)	05.61 (2.43)	11.24 (5.84)
Gross Cost (A=TFC+TVC)	147.3 (100.00)	200.31 (100.00)	230.64 (100.00)	192.75 (100.00)
Value of Dung(B)	17.45	17.11	10.17	14.91
Net Cost (C=A-B)	129.85	183.20	220.47	177.84
Price of milk (Rs/litre)	41.00	41.64	40.00	40.88

Milk production (litre/animal/day) (E)	03.48	05.08	06.02	04.86
Gross Return (D)	160.13	228.64	250.97	213.24
Net Returns (D-C)	30.28	45.44	30.50	35.41
Cost of milk production (Rs/litre) (C/E)	37.31	36.06	36.62	36.66
Net Returns (Rs/litre) (D-C/E)	08.70	08.94	05.07	7.57

Figures in the parenthesis indicate the percentage of the gross cost of milk production

Table 8. Cost and return of milk production of crossbred cattle in households (Rs. /Animal/ Day)

Cost and Return components	Herd size category			Overall
	Small	Medium	Large	
Green fodder (F1)	73.35 (33.61)	75.34 (32.61)	113.70 (37.86)	87.46 (35.00)
Dry fodder (F2)	28.12 (12.88)	36.23 (15.68)	48.24 (16.06)	37.53 (15.02)
Concentrate (F3)	43.87 (20.10)	51.11 (22.13)	76.21 (25.38)	57.06 (22.84)
Feed and fodder cost (F1+F2+F3)	145.34 (66.59)	162.68 (70.42)	238.15 (79.30)	182.05 (72.86)
Labour cost (V2)	38.47 (17.63)	43.70 (18.92)	48.59 (16.18)	43.59 (17.45)
Veterinary & Miscellaneous cost (V3)	5.60 (02.56)	3.42 (01.48)	5.69 (01.90)	4.90 (01.96)
Total Variable Cost (V1+V2+V3)	189.41 (86.78)	209.83 (90.83)	292.43 (97.38)	230.55 (92.27)
Total Fixed Cost (TFC)	28.85 (13.21)	21.19 (09.17)	7.88 (02.62)	19.30 (07.73)
Gross Cost (A=TFC+TVC)	218.26 (100.0)	231.02 (100.0)	300.31 (100.0)	249.86 (100.0)
Value of Dung (B)	16	15.5	15	15.5
Net Cost (C=A-B)	202.26	215.52	285.31	234.36
Price of milk (Rs./litre)	36.75	36.00	36.23	36.32
Milk production (litre/animal/day)(E)	06.80	08.00	10.00	08.26
Gross Return (D)	265.9	303.5	377.3	315.56
Net Returns (D-C)	63.64	87.98	91.99	81.20
Cost of milk production (Rs/litre) (C/E)	29.74	28.73	28.53	28.37
Net Returns (Rs./litre) (D-C/E)	9.36	11.00	9.20	9.83

Figures in the parenthesis indicate the percentage of the gross cost of milk production

Table 9: Cost and return of milk production across indigenous and crossbred cattle by households (Rs. /Animal/ Day)

Cost and Returns components	Indigenous cattle	Crossbred cattle	Overall
Green fodder (F1)	62.71 (32.53)	87.46 (35.00)	75.08 (33.92)
Dry fodder (F2)	28.46 (14.76)	37.53 (15.02)	32.99 (14.90)
Concentrate (F3)	41.98 (21.77)	57.06 (22.84)	49.52 (22.37)
Feed and fodder cost (F1+F2+F3)	133.16 (69.06)	182.05 (72.86)	157.60 (71.21)
Labour cost (V2)	45.46 (23.57)	43.59 (17.45)	44.52 (20.12)
Veterinary & Miscellaneous cost (V3)	02.88 (01.53)	4.90 (01.96)	3.89 (1.76)
Total Variable Cost (V1+V2+V3)	181.51 (94.16)	230.55 (92.27)	206.03 (93.09)
Total Fixed Cost (TFC)	11.24 (5.84)	19.30 (07.73)	15.27 (6.90)
Gross Cost (A=TFC+TVC)	192.75 (100.00)	249.86 (100.00)	221.30 (100.00)
Value of Dung (B)	14.91	15.50	15.20
Net Cost (C=A-B)	177.84	234.36	206.10
Price of milk (Rs. /litre)	40.88	36.32	38.60
Milk production (litre/animal/day) (E)	04.86	08.26	06.56
Gross Return (D)	213.24	315.56	268.41
Net Returns (D-C)	35.41	81.20	62.31
Cost of milk production (Rs/litre) (C/E)	36.66	28.37	31.41
Net Returns (RS/litre) (D-C/E)	07.57	09.83	09.50

Figures in the parenthesis indicate the percentage of the gross cost of milk production

Table 10. Resources use efficiency of Indigenous and Crossbred cattle for milk production.

Inputs	Indigenous Cattle		Crossbreed Cattle	
	Coefficients	Standard error	Coefficients	Standard error
Green Fodder	0.05	0.12	-0.20	0.35
Dry Fodder	0.52***	0.15	0.15	0.27
Concentrate	0.42***	0.10	1.89**	0.87
Labour	-0.10	0.12	0.10	0.22
Veterinary charge	0.50	0.14	-0.06	0.20
R² value		0.58		0.30
No of observation		160		160

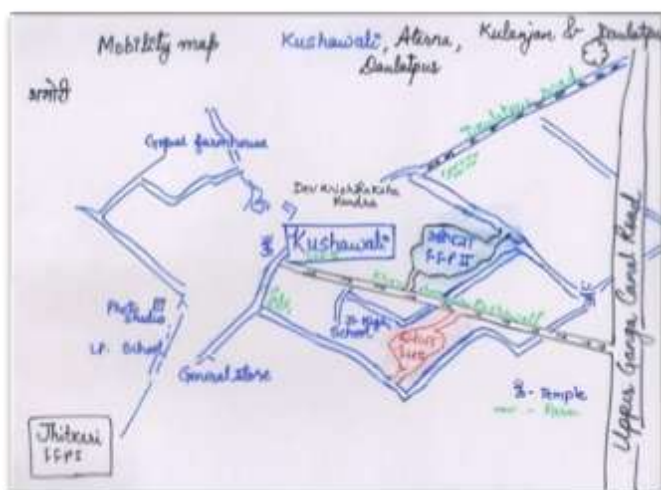
*Significant at 10 per cent level ($p < 0.1$), **Significant at 5 per cent level ($P < 0.05$),

***Significant at 1 per cent level ($P < 0.01$)

III. ICAR Funded Schemes

A. FARMER FIRST PROGRAMME

Extensive outreach and development initiatives were undertaken under the Farmer FIRST Programme. These included 23 Animal Health Camps, serving 1,230 animals, and 52 outreach visits that benefited 976 farmers and 452 farm families. Twelve demonstrations on livestock and Integrated Farming Systems (IFS) were conducted. A training program and Farmer's Field Day were also organized. On Kisan Diwas 2024, nine progressive farmers and nine para-veterinarians were felicitated. Vermicomposting units were demonstrated and established in selected villages, benefiting 580 farmers. IFS demonstrations included the cultivation of hybrid Napier grass, mustard, black lentils, vegetables, and sunflower within mango orchards. Technical support was extended to vegetable and pulse crop cultivation, reaching 600 farmers. Training and demonstrations on milk processing, packaging, and marketing were held, benefiting 700 farmers. Additionally, a Farmer Producer Organization (FPO) named *Kaleena Argo Farmer Producer Company Limited* was formed. A total of 1,400 doses of quality semen were provided to nine local inseminators, resulting in 356 successful pregnancies. These inseminators also received refresher training in artificial insemination (AI). A design patent was granted for the “Uplatoon – Dung Cake Maker” (Patent No. 439725-001, dated 06.12.2024). An eight-day training programme titled “सतत आजीविका के लिए डेयरी फार्मिंग : प्रभावी रणनीतियाँ एवं हस्तक्षेप” was conducted from 17th to 24th December 2024. Additionally, a Field Day/Kisan Diwas was celebrated on 23rd December 2024.



Mobility Map of FFP-II adopted villages



Organic Vegetable Farming in Kushwali village

B. CRP on Agro-Biodiversity

The project for establishing a cryo-bank of somatic cells from Indigenous cattle breeds was taken up with ICAR-NBAGR, Karnal serving as the lead centre and ICAR-CIRC, Meerut as the collaborating unit. The main objective was to ensure the long-term conservation of valuable Indigenous cattle genetic resources. For the current year, the target breeds identified for cryo-banking at ICAR-CIRC, Meerut included Ponwar, Vechur, Pullikulam, Krishna Valley, and Khariar, with cryo-banking of Vechur being carried out at the lead centre, NBAGR. During the reporting period, somatic cell cryo-banking was successfully conducted for four Indigenous breeds: Badri, Pullikulam, Ponwar, and Khariar. Ear tissue samples were collected from Badri cattle at GBPUA&T, Pantnagar (Uttarakhand); Pullikulam cattle at the Pullikulam Research Station, Manamadurai (Tamil Nadu); Ponwar cattle from the Pilibhit region (Uttar Pradesh); and Khariar cattle from the Nuapada region (Odisha). A total of 4 samples for each breed, 2 males and 2 females were included in the study. These samples were processed for fibroblast cell culture at ICAR-CIRC, Meerut up to five passages.

As a result, viable fibroblast cells were successfully cryopreserved for Badri (42 vials: 15 from males, 27 from females), Pullikulam (10 vials: 5 from males, 5 from females), and Khariar (vials: 13 from males, 15 from females). However, the fibroblast cells derived from Ponwar cattle were lost during processing, and renewed efforts are underway to recollect samples and complete their cryopreservation. For Pullikulam, while two male and two female samples were collected, only one male and one female sample were processed at ICAR-CIRC, Meerut, with the remaining samples sent to ICAR-NBAGR, Karnal. The preserved fibroblast cells from Badri, Pullikulam, and Khariar are currently being expanded to facilitate large-scale cryo-banking, which will significantly contribute to the long-term conservation of these valuable Indigenous genetic resources. In addition to these efforts, several other Indigenous breeds have already been conserved at NBAGR, Karnal, further strengthening the national initiative for genetic resource conservation.



C. **Swacchta Action Plan (SAP)**

A grant of ₹18 lakhs was received under the scheme to enhance the "microbial-based agricultural waste management system." The existing vermicomposting facility was expanded with the addition of eight new vermi beds, enabling the processing of an extra 16 tonnes of dung waste. A mechanical composting machine was also installed to rapidly convert feed and fodder waste from the animal farm, along with tree leaves and other biomass, into material suitable for vermicomposting. The process for handling dry waste was optimized alongside dung waste, with the mechanically treated output—after 6–8 hours—layered into the vermi beds to accelerate composting. The upgraded unit, now comprising 14 beds, has a monthly production capacity of approximately 30 quintals. It generated around ₹6 lakhs in revenue through the sale of vermicompost to farmers, urban residents, and distribution to villages under the SCSP and TSP schemes.

D. **All India network program on Ethno Veterinary Medicine**

The objective of the project is to evaluate the effect of as an alternative additive to enhance bull sperm freezability. Study was conducted at Cattle Reproduction and Physiology division of ICAR-CIRC, Meerut. Frieswal (Holstein Friesian and Sahiwal cross; having 5/8 Holstein Friesian inheritance) breeding bulls maintained under uniform feeding and housing conditions was utilized for the study. The semen ejaculates were collected using artificial vagina as per regular standard practice. A total of 36 ejaculates from 3 breeding bulls using Artificial vagina method as per CMU. The part of fresh ejaculates was initially diluted (1:1) in Tris-egg yolk-glycerol extender (TEYG) and initial percent progressive motility was done at 200x magnification with phase contrast microscope. Samples with $\geq 70\%$ progressive motility, ≥ 500 million spermatozoa/mL, and >2 mL volume was utilized for further processing, supplementation, and cryopreservation. If any of the ejaculate failed above criteria, it was rejected to avoid any incongruity in the experiment. A total of two plant extracts obtained from CSIR-CIMAP and code as R_AMR_E and R-AMS-E were used each time during in the study

The samples were divided into four groups: a control group (CG) without supplementation and treatment groups I, II, and III (TG-I, TG-II, and TG-III) supplemented with 1%, 2%, and 4% v/v aqueous extract, respectively. Post-thaw semen quality was evaluated based on progressive motility, viability, acrosome integrity, plasma membrane integrity, and two oxidative stress markers: reactive oxygen species (ROS) and malondialdehyde (MDA) levels. R_AMR_E and R-AMS-E extract supplementation significantly ($p < 0.05$) enhanced post-thaw sperm motility, viability, acrosome integrity, and plasma membrane integrity compared to the control group. Additionally, oxidative stress markers, viz. reactive oxygen species (ROS) and malondialdehyde (MDA), were significantly ($p < 0.05$) reduced in treated samples, indicating its antioxidative protective effect during cryopreservation. Among the tested concentrations 1% v/v in case of R-AMS-E extract and 4% in case of R_AMR_E demonstrated optimal efficacy in preserving sperm functional parameters.

E. **SPECIAL ASSISTANCE PROGRAMME OF CENTRAL GOVERNMENT**

(i) **Activities under Scheduled Caste Sub Plan (SCSP)**

Sabka Saath Sabka Vikas is very much essential for overall development of farming community. Keeping this mission in mind, various training programmes were conducted for the benefit of farmers and livestock keepers belonging to scheduled caste community under SCSP. Details of the programmes conducted are as below:

S.No.	Name of the training	Venue & Date	No. of Farmers	Input Distributed
1	Rice Producer Kisan Goshthi	22 Apr 2024 Village Phaphunda, Meerut	81	Electric Madhani Dewormer Antiseptic Cream CIRC-Mineral mixture
2	Rice Producer Kisan Goshthi	24 Apr 2024 Village Manduwala, Saharanpur	49	Dewormer Paddy Seed Antiseptic Cream Acaricide CIRC-Mineral mixture
3	Rice Producer Kisan Goshthi	24 Apr 2024 Village Lal Wala Khalsa, Haridwar	37	Dewormer Paddy Seed Antiseptic Cream Acaricide
4	Rice Producer Kisan Goshthi	30 Apr 2024 Village Phaphunda, Meerut	25	Paddy Seed CIRC-Mineral mixture
5	Labour Day	01 May 2024 ICAR - CIRC, Meerut	75	Iron Tasla PVC Pipe Steel Bucket CIRC-Mineral mixture
6	Rice Producer Kisan Goshthi	07 May 2024 Village Tiyala, Hapur	44	Dewormer Mineral mixture Paddy Seed Steel Bucket
7	Shikshak Samman Diwas cum Input Distribution Camp on “Vermicomposting”	05 Sep 2024 DAV Higher Secondary School, Sadar, Meerut	45	Milk Can
8	Augmentation of milk production through supplementary feeding	11 Sep 2024 ICAR –CIRC, Meerut	165	Cattle Feed Dewormer Iron Tasla Antiseptic Cream Sickle Spade
9	Augmentation of milk production through supplementary feeding	13 Sep 2024 Village Manduwala, Saharanpur	40	Cattle Feed Dewormer Iron Tasla Antiseptic Cream Sickle
10	Augmentation of milk production through supplementary feeding	27 Sep 2024 KVK Babugarh, Hapur	122	Cattle Feed Dewormer Iron Tasla Antiseptic Cream
11	Value addition of milk	29 Oct 2024 KVK, Babugarh	30	Electric Madhani Muslin Cloth Citric Acid Dewormer

12	Augmentation of milk production through supplementary feeding	03 Nov 2024 ICAR-CIRC, Meerut	249	Iron Tasla Mineral mixture Steel Bucket Sickle Spade CIRC-Mineral mixture
13	Wheat Producer Kisan Goshthi	13 Nov 2024 Village Phaphunda, Meerut	71	Wheat seed CIRC-Mineral mixture

Organization of Kisan Mela

S.No.	Details of Kisan Mela	No. of Farmers participated	Date & Venue
1	Pashu Aarogya Mela In Collaboration with KVK, Piprakothi, DRPCA, PUSA, Samastipur Bihar under SCSP programme	400	KVK, Piprakothi 11th Feb 2024

Development of Model Villages

Under the Schedule Caste Sub Plan Five villages of district Meerut viz. Allipur, Chandsara, Hajipur, Jalalpur and Phaphunda were adopted under the project “***Improvement of productivity of livestock through different interventions for sustainable food security and livelihoods***”. During the last five-year various interventions were executed under the project pertaining to livestock production in the adopted villages which resulted in augmentation of milk production in adopted villages and increasing the farmer income and household nutritional security. The interventions executed and the input distributed in the adopted villages under SCSP are as below:

S.No.	Name of Intervention	Input Distributed
1	Augmentation of Milk Production	Cattle Feed, CIRC Mineral Mixture
2	Clean Milk Production	Tarpaulin, Steel Buckets, Milk Can Iron Tasla, PVC Pipes
3	Health care of animals	Teat dip, CMT Kits, Acaricidal medicines, Dewormers, Skin Creams, Vaccination of animals
4	Value Addition of Milk	Electric Mathani, Muslin Cloth and Citric Acid
5	Reduction of drudgery to farm women	Sickle, Spade, Chaff Cutter
6	Augmentation of Fodder supply	Hybrid Napier slips, Fodder Preservation, Silo bags
7	Value Addition of Dung	Vermibeds, Earthworms
8	Household Nutritional Security	Paddy Seed, Wheat Seed



(ii) NEH region activities

Under the scheme the institute is working for the livelihood improvement of the farmers belonging to north eastern hill (NEH) region by establishing Custom Hiring Centres, self-help groups, organizing training on scientific animal husbandry practices, awareness programmes animal health camps and distribution of various input to the farmers of NEH region.

Establishment of Custom Hiring Centre

At Meghalaya:

Two custom hiring centre were established at East Khasi Hills at the premises of two self-help group namely Shalyntem Ki Nongre Society, Tynring and Nangsanirat Women SHG, Umsawmat. constituted under ICAR –ATARI Zone VII and Krishi Vigyan Kendra, East Khasi Hills, Department of Agriculture and Farmers Welfare, Meghalaya in collaboration with ICAR-CIRC, Meerut under NEH Component of the Institute. The self-help group and custom hiring centres established under this project are benefitting the farmers in reducing the drudgery associated with various farm related activities. All the farm implements given to these custom hiring centres were procured from ICAR Research Complex for NEH Region, Umiam, Meghalaya with aim to promote and popularization various technologies developed by ICAR for increase farmer acceptability and adaptability.

Name of the minor farm implement	Quantity
1. Adjustable Row Maker	30 No.
2. Cono Weeder	30 No.
3. Fruit Harvester (Crown Type)	30 No.
4. Fruit Harvester (Cut Type)	30 No.
5. Garden Rake	50 No.
6. Hand Fork	50 No.
7. Manual Trolley with Single Wheel	30 No.
8. Multipurpose U Blade Weeder	30 No.
9. Multipurpose V Blade Weeder	30 No.
10. SRI Row Maker	30 No.
11. Wheel Hoe with one sweep blade	30 No.
12. Wheel Hoe with three sweep blade	30 No.
13. Zero till furrow opener	30 No.



Custom Hiring Centre Established in Collaboration with ICAR –ATARI Zone VII and Krishi Vigyan Kendra, East Khasi Hills, Department of Agriculture and Farmers Welfare

Training programmes conducted for the farmers of NEH region

During the year 2024-25, a total of 5 training programmes were organized with the support of ICAR-NRC Mithun for the farmers of North eastern region. In these programmes farmers were given training on scientific cattle health management, vermicomposting, scientific breeding, husbandry, vaccination etc. 450 farmers from different district of North eastern region participated in these programmes and benefitted.

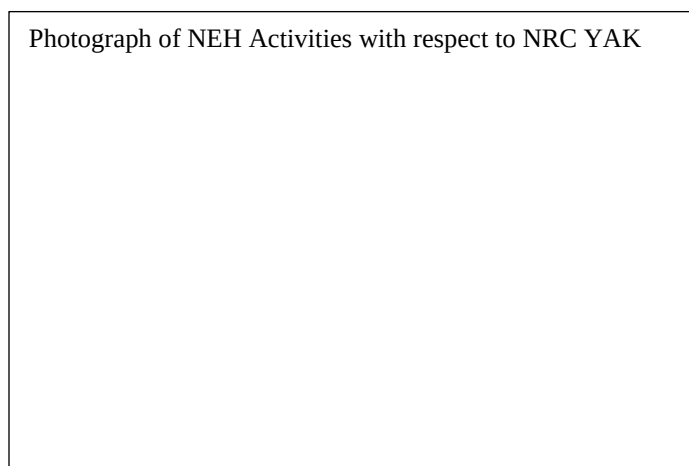
S No	Name of the programme	Venue and date	No of farmer
1	Workshop on Promotion of Scientific Cattle Production in Nagaland State”	Medziphema, Nagaland, 25th June 2024	140
2	Interactive meeting with farmers	KVK Phek, Porba Nagaland 26 th June 2024	50
3	Hands on training on vermi composting technique to women farmers	NRC Mithun, Nagaland 25 th November 2024	20
4	Training on Scientific breeding, husbandry and health practices for Mithun production	Bichom District Arunachal Pradesh 5 th December 2024	120

5	Training on Scientific Mithun Husbandry and Vaccination camp	Kadi Village, Tamelong district 14th November 2024	100
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NEH activities undertaken by ICAR-CIRC in collaboration with NRC Yak

During the year 2024-25, a total of 4 (four) Awareness cum input distribution programmes were organized with the help of ICAR-NRC Yak, Dirang. In these programmes Animal Feed ingredients, small and medium equipment's, medicines etc were distributed for scientific cattle rearing to the farmers of Arunachal Pradesh. Approx. 900 farmers were benefitted by input distribution programmes.

Photograph



(iii) Tribal Sub Plan

Under the Tribal Sub-Plan (TSP), various programs were conducted for the benefit of the Scheduled Tribe community. A total number of 300 farmers were benefitted under TSP project to support their livestock rearing practices, ensuring better productivity and sustainability enhancing farmers' knowledge on cattle nutrition, health, reproduction and production, with expert lectures delivered on these critical aspects. As a result, the economic condition of the tribal families showed signs of improvement, supporting their livelihood and overall well-being.



Fig. Training cum input distribution programme under TSP at Bawan Sarai Village, Kotwali block, Bijnor District

S.No.	Name of Programme	Date	Venue
1	Training cum input distribution programme under TSP scheme where a total of 100 tribal farmers participated and benefitted and distributed Tasla, Bucket, Cattle feed, Mineral mixtures and interacted with farmers.	20th December, 2024	Bawan Sarai village of Bijnor District

IV. Externally Funded Projects

DAHD Sponsored Projects

(I) Establishment of an Advanced Assisted Reproductive Technologies (ART) Centre: Nurturing Innovations in Cattle Reproduction/ Establishment of Centre of Excellence (OPU-IVF Lab) at ICAR-CIRC Meerut under RGM.

Under this project, significant progress has been made in advancing assisted reproductive technologies (ART) in cattle. A total of 48 cattle embryos have been successfully produced through the in vitro fertilization (IVF) technique. These embryos were developed in collaboration with ICAR-NDRI, Eastern Regional Station (ERS), Kalyani, West Bengal. The embryo production and cryopreservation were conducted at the ICAR-NDRI, Kalyani institute. The cryopreserved embryos, along with cryopreserved mature oocytes, were subsequently transported to ICAR-CIRC, Meerut for further research and application under this initiative. Additionally, three Trigas incubator—a critical equipment for IVF procedures—has been successfully procured under this project to strengthen the laboratory infrastructure at ICAR-CIRC, Meerut. This collaborative effort marks a key milestone toward establishing a Centre of Excellence in ART, enhancing the capabilities for cattle reproductive management and germplasm conservation.

In continuation of IVF Embryos of Tharparkar and Gir cattle were produced in collaboration with ULDB Kalsi, Dehradun using sex sorted semen of their respective bulls and a total of 15 IVF sexed (Female) embryos (9 Tharparkar & 6 Gir) were transferred in our CIRC recipients from which Four recipients are expected to conceive on non return basis.

(II) Strengthening of semen station under Rashtriya Gokul Mission

The objective of this project is to establish a state-of-the-art frozen semen station as per CMU guidelines, enhance the production of quality bull semen through improved nutritional, managerial, and health strategies, assess reproductive performance using advanced molecular tools in semen biology, and provide hands-on training in artificial insemination to strengthen human resource skills. During the year 2024–25, under the project "Strengthening of Semen Station under Rashtriya Gokul Mission," a total of **99,239 semen doses** were produced, including **86,706 doses from Frieswal bulls** and **12,533 doses from Sahiwal bulls** and **Semen Sale, Frieswal 67810 doses & Sahiwal 12694 doses** which is **80504**. We conducted initial semen motility evaluations and post-thaw motility assessments to ensure semen quality. We also facilitated the procurement of semen straws and other essential consumables. These efforts contributed significantly to achieving the project's objectives and enhancing the overall efficiency and capacity of the semen station.

DST Sponsored Projects

Utilization of paddy straw as complete fodder block by treating with Gomutra (Indigenous cow urine)

The present experiment was carried out to standardize cow urine treated paddy straw fodder blocks. The fodder blocks of paddy straw treated with indigenous cow urine, commercial urea and water were prepared with inclusion of concentrate mixture and were analysed for proximate principles and in-vitro analysis. The dry matter and crude protein content in different treatments varied from 85.21 to 91.13% and 6.09 to 8.23%, respectively. Upon in-vitro analysis, IVDMD varied from 39.9 to 75.8% among different treatments. After standardization, indigenous cow urine treated fodder blocks were prepared and a feeding trial was conducted on growing cattle calves at COVAS, SVPUAT, Modipuram. The blood and rumen liquor samples were collected and observations on the performance of experimental animals were recorded.

Utilization of paddy straw as complete fodder block by treating with Gomutra (Indigenous cow urine)

—The present study was undertaken with the objective of standardizing paddy straw based fodder blocks treated with indigenous cow urine. Fodder blocks were prepared using paddy straw treated with three different additives: indigenous cow urine, commercial urea, and plain water. To improve the nutritive value, a concentrate mixture was incorporated into the formulation. These blocks were then subjected to proximate analysis and in-vitro digestibility testing to assess their chemical composition and potential nutritional benefits. The dry matter (DM) content of the various treatments ranged from 85.21% to 91.13%, indicating good storage potential and stability. The crude protein (CP) content varied between 6.09% and 8.23%, with certain treatments showing a clear enhancement in protein levels, likely due to nitrogen enrichment from urea or cow urine. Other parameters analyzed included organic matter (OM), ether extract (EE), acid insoluble ash (AIA), and neutral detergent fiber (NDF), which exhibited moderate variability across treatments, reflecting differences in fiber composition and mineral content.

—The specific chemical composition of each treatment is detailed in the following results: DM ranged from 85.21% to 91.13%, OM from 85.41% to 89.74%, CP from 6.09% to 8.23%, EE from 0.91% to 1.78%, AIA from 6.21% to 8.05%, and NDF from 61.20% to 71.50%. These findings suggest that cow urine treatment, particularly when combined with concentrate, had a positive effect on enhancing the nutritive profile of the paddy straw based fodder blocks. To assess digestibility and fermentation characteristics, in-vitro gas production studies were conducted. The gas production ranged from 9.4 ml to 19.0 ml, with methane production varying between 9.08% and 14.05%. In-vitro dry matter digestibility (IVDMD) showed a wide range, from 39.89% to 75.80%, whereas in-vitro organic matter digestibility (IVOMD) ranged from 40.02% to 77.03%. The highest IVDMD and IVOMD values were observed in the treatment that yielded the highest gas production, indicating improved digestibility due to better fermentability of the treated fodder.

— Following the laboratory evaluation, the most promising formulation cow urine treated fodder blocks was selected for a feeding trial. This trial was carried out on growing cattle calves at the College of Veterinary and Animal Sciences (COVAS), SVPUAT, Modipuram. During the feeding period, blood and rumen liquor samples were collected periodically to assess metabolic and ruminal parameters. Animal performance data, including feed intake, weight gain, and general health observations, were also recorded to evaluate the efficacy of the standardized fodder blocks in improving livestock productivity.



Fig: Cow urine treated complete feed block

— Overall, the study indicated that treatment of paddy straw with indigenous cow urine, in combination with concentrate, not only improved the proximate composition and digestibility of the fodder blocks but also showed potential as a sustainable and cost effective feed resource for growing cattle. The feeding trial further supported these findings, indicating improved performance and physiological responses in calves fed with the treated fodder blocks.

Table: Composition of fodder blocks

Sl	DM (%)	OM (%)	CP (%)	EE (%)	AIA (%)	NDF (%)
1	88.01±0.93	88.39±1.16	7.72±0.82	0.91±0.91	6.78±1.12	61.20±1.04
2	87.08±0.82	89.74±1.15	7.69±0.88	1.78±1.10	6.42±0.15	63.23±1.27
3	87.16±1.12	87.99±0.81	8.02±1.01	0.92±0.02	7.93±1.42	62.40±0.93
4	90.04±1.02	89.73±0.65	7.99±1.01	1.75±0.91	6.21±0.75	64.78±0.85
5	91.13±1.03	85.41±0.98	8.23±1.05	1.11±1.01	7.56±0.93	68.28±1.01
6	85.21±1.13	87.41±0.97	6.34±1.21	1.04±1.02	7.32±0.67	67.76±0.76
7	89.02±0.91	86.33±1.22	6.09±0.81	1.19±1.52	7.95±1.22	70.12±0.92
8	89.67±0.81	87.76±0.90	6.12±1.15	1.02±0.73	8.05±1.01	71.50±1.13

Table: In-vitro analysis of fodder blocks

S.No.	Gas Production (ml)	Methane (%)	IVDMD (%)	IVOMD (%)
1	13±1.42	11.55±1.09	65.29±1.67	68.20±1.32
2	16±1.81	14.05±2.01	70.03±2.09	72.92±2.11
3	17±1.33	12.44±1.87	68.72±1.95	71.09±1.90
4	17.5±2.11	11.96±1.42	68.62±1.49	70.02±1.65

5	19.0±1.09	12.80±1.02	75.8±1.69	77.03±1.56
6	10.5±1.23	11.80±1.34	66.7±2.10	68.3±1.32
7	9.7±1.31	10.99±1.23	39.89±1.83	40.02±1.77
8	9.4±1.02	9.08±1.02	55.19±1.75	56.3±1.89

V. Service sections:

(I) Male Germplasm Unit

The herd strength of Frieswal and Sahiwal bulls and bull calves at MGU on 1st January, 2024 was 93. The unit received two Frieswal bull calves from FPT unit BAIF, Pune and two from ICAR-CIRC herd maintained at ICAR-NDRI, Karnal. Figure 1 indicates the number of semen ejaculates collected during different months in the reported period. The adult bulls including training bulls are prepared and taken for routine semen collection at Semen Freezing Laboratory. Semen ejaculates (3530) were collected at semen collection centre.

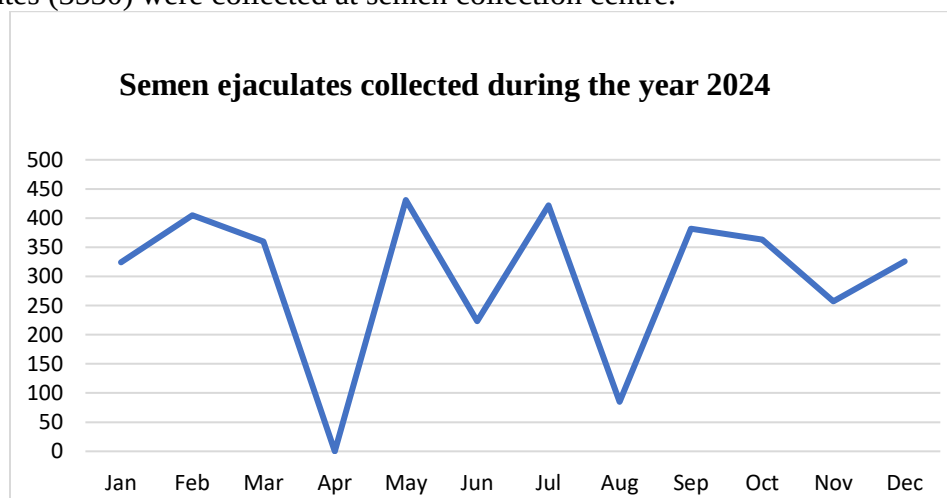


Figure 1: Number of semen ejaculates collected during the reported year

(II) Experimental Dairy Unit

The herd strength of Frieswal and Sahiwal cows and calves at experimental dairy unit on 1st January, 2024 was 42. During the year, three Sahiwal female calves and seven Frieswal female and 3 male calves were born at the dairy unit of the institute. 22425 litres of milk amounting Rs 11,21,250/- was produced in the experimental dairy unit of the institute. Figure 1 indicates the quantity of milk produced during different months in the reported period.

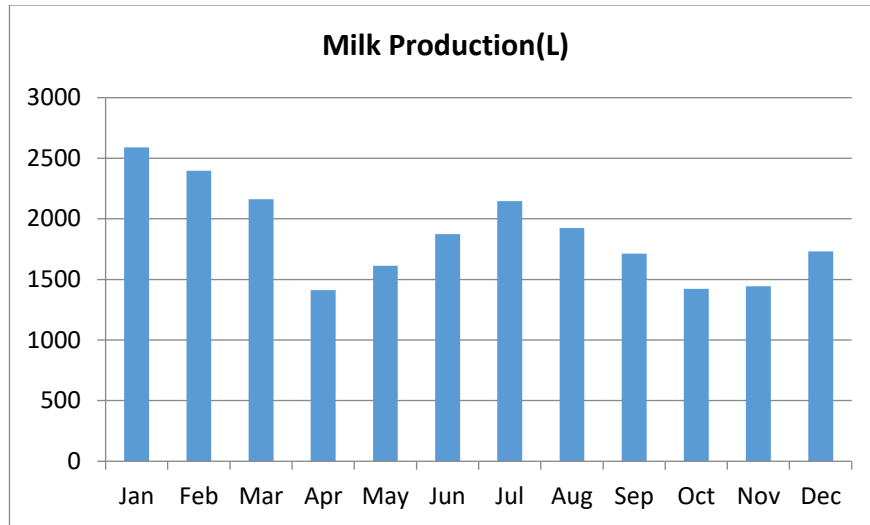


Figure: Milk production at the experimental dairy unit during the reported year
The research experiments of scientists of the institute were conducted on Sahiwal and Frieswal cows during the year.

INSTITUTE FUNCTIONARIES

A) Priority Setting, Monitoring and Evaluation (PME) Cell

The Priority Setting, Monitoring and Evaluation (PME) Cell supports the Director of the Institute in guiding research efforts with a focus on priorities, efficient resource allocation, relevance, and the monitoring and evaluation of research projects, ensuring institutional accountability. The Cell compiles and integrates inputs from QRT, RAC, IRC, institutional vision documents, and ICAR to propose research priorities and identify key researchable issues. It is responsible for annual updates and submitting reports to the Director for the assignment of research projects. Additionally, it coordinates the annual monitoring of ongoing projects and evaluates completed ones through internal and external experts. The Cell also facilitates the validation and/or impact assessment of successful technologies claimed by scientists using expert review. Moreover, it conducts regular sensitization and capacity-building programs for scientists in collaboration with the HRD unit, and maintains a comprehensive database of all publications, developed technologies, IPRs (in coordination with ITMU), consultancies, completed and ongoing projects.

RESEARCH PROJECT

The following research projects were in operation during the year 2024

AICRP on Cattle					
S. No.	Project Title	period	PI	Co-PIs	Status
1.	Genetic studies on the performance of important indigenous breeds and their improvement through selection (IBP)	(04/01/2011 to 30/3/2026)	Dr Sushil Kumar	Dr Suresh Kumar D. S Dr Divya Devara	Ongoing
2.	Field recording of performance data for undertaking large scale progeny testing (FPT)	(01/07/1992 to 31/3/2026)	Dr Achintya Kumar Das	Dr R. Kumar	Ongoing
Institutional					
1.	Comparative performance of Indigenous vis-à-vis crossbred cattle at commercial dairy farms	1/10/2020 to 31/03/2024	Dr Ravinder Kumar	Dr A. K. Das Dr H. L. Singh (SVPUAT)	Completed
2.	Productivity enhancement of farmers cattle through Frieswal cattle breed under	01/09/2024 to 31/08/2027	Dr Ravinder Kumar	Dr Sushil Kumar Dr Suresh Kumar D. S	Ongoing

	field conditions of western part of Uttar Pradesh			Dr Divya Devara	
3.	Study on utilization pattern of ICT tools by extension workers and dairy farmers of western Uttar Pradesh	01/09/2024 to 31/08/2027	Dr Naresh Kumar	Dr S.K. Verma Dr Rajiv Ranjan Kumar	Ongoing
4.	Optimization of Guide RNA for CRISPR/Cas9-mediated knockout of CD46 in cattle fibroblasts.	01/10/2024 to 30/09/2027	Dr Divya Devera	Dr A K Mohanty, Dr Sushil Kumar, Dr Ravinder Kumar, Dr Rajiv Ranjan Kumar, Dr Anjali, Dr P Chandra Sekhar	Ongoing
5.	Multiplication of superior indigenous cattle germplasm through multiple ovulation and embryo transfer (MOET)	1/10/2020 to 31/03/2025	Dr Suresh Kumar D.S	Dr R. Kumar Dr S. Saha Dr M. Pande Dr Sushil Kumar	Ongoing
6.	Biochemical constituents of blood and semen in relation to fertility attributes of Frieswal bulls	01/07/2021 to 31/03/2025	Dr. S. Saha	Dr Pramod Singh Dr Megha Pande	Ongoing
7.	Assessment of subclinical mastitis and development of therapeutics for its management in cattle	01/04/2021 to 30/09/2024	Dr. Naimi Chand	Dr A.S. Sirohi, Dr Sumit Mahajan	Completed
8.	Evaluation of herbo-mineral supplementation for amelioration of immune-metabolic and oxidative stress in transitional cow	1/07/2023 to 30/06/2026	Dr S Mahajan	Dr S. K. Verma Dr A. S. Sirohi Dr N. Chand	Ongoing

9.	Optimizing Bull semen sex sorting technology through viability-based approaches	01/10/2023 to 30/09/2026	Dr Megha Pande	Dr. Suresh Kumar D.S, Dr. A.K. Mohanty, Dr Anjali, Dr S. Saha, Dr A.S Sirohi, Dr N. Chand, Dr S. Mahajan	Ongoing
10.	Investigation of Heat stress impact on Frieswal cattle and enhancement of their thermo tolerance through HSP40 gene modulation	01/09/2024 to 31/08/2027	Dr Anjali	Dr. Megha Pande, Dr. Suresh Kumar, Dr. Divya, Dr. S. Saha, Dr. Rajiv Ranjan, Dr. A.K. Mohanty	Ongoing
11.	Influence of Dietary supplementation of botanicals on Bull semen quality	01/04/2024 to 31/10/2025	Dr Pramod Singh	Dr S Saha Dr A. Biswas Dr AVS Sirohi	Ongoing
12.	Quality augmentation of alternate feed resources through ensiling	01/01/2024 to 31/10/2025	Dr Pramod Singh	Dr Naimi Chand and Dr A. Biswas	Ongoing
13.	Effect of Soy Lecithin on semen quality parameters and semen production in Frieswal bulls	01/10/2022 to 31/03/2026	Dr. S.K. Verma	Dr Sumit Mahajan and Dr S Saha	Ongoing
14.	Development of dung-based bio-briquettes as a solid fuel source	01/10/2022 to 30/09/2025	Dr. Rajiv Ranjan Kumar	Dr S K Verma	Ongoing
15.	Production of omega-3 fatty acids enriched designer milk through feeding of microalgae derived from cattle effluents: A waste to wealth approach	01/09/2024 to 31/08/2027	Dr A Biswas	Dr Pramod Singh Dr. S.K. Verma Dr. Rajiv Ranjan Kumar Dr AVS Sirohi	Ongoing
16.	Predicting Bull Breeding soundness	01/09/2024 to 31/08/2027	Dr A S Sirohi	Dr Naimi Chand	Ongoing

	using machine learning tools			Dr Megha Pande	
17.	Analysis of differences in milk constituents of Frieswal and Sahiwal.	01/09/2024 to 31/08/2026	Dr R R Kumar	Dr Naimi Chand Dr Divya Devara	Ongoing
Service Project					
1.	Quality assessment of Frieswal bull semen	01/06/2013 onwards	Dr Naimi Chand	Dr M. Pande	Ongoing
Externally funded					
1.	DST SUTRA-PIC project: Utilization of paddy straw as complete fodder block by treating with Gomutra (Indigenous cow urine)	01.01.2022 to 31.07. 2025	Dr. A.S. Sirohi	Dr Naimi Chand Dr S K Verma, CCPI: Dr Nitin Tyagi, NDRI, Karnal, CCPI: Dr Sachin Kumar, NDRI; CCPI: Dr Faheem Ahmad, SVPUAT, Modipuram)	Ongoing
2.	Strengthening of Semen Station under Rashtriya Gokul Mission	01/01/2022	Dr. Megha Pande (Nodal Officer)	Dr. Suresh Kumar Dr. A.S. Sirohi Dr. Naimi Chand Dr. S. Saha Dr. Sumit Mahajan	Ongoing
3.	Establishment of an Advanced Assisted Reproductive Technologies (ART) Centre: Nurturing Innovations in Cattle Reproduction/ Establishment of Centre of Excellence (OPU-IVF Lab) at	01/04/2024	Dr Suresh Kumar D. S	Dr Megha Pande, Dr S. Saha, Dr Anjali	Ongoing

	ICAR-CIRC Meerut under RGM.				
ICAR Funded Scheme					
1.	Livelihood Improvement through Sustainable Dairy Farming using Suitable Interventions (Farmer FIRST Programme)	05/04/2017 To 31/03/2021	Dr Suresh Kumar D. S.	Dr. S. Saha Dr. Naresh Prasad Dr. Naimi Chand Dr. Megha Pande Dr. JP Dabas	Ongoing
2.	All India network program on Ethno-Veterinary Medicine	01/07/2024 onwards	Dr. Sumit Mahajan	Dr. Naimi Chand Dr. A.V.S.Sirohi Dr. S.K. Dabas	Ongoing
3.	National Agriculture Innovation Fund (NAIF)	01/06/2009 onwards	Dr. Sumit Mahajan	Dr. Sushil Kumar	Ongoing
4.	Special Assistance Program of Central government SCSP/TSP/NEHR	Ongoing activities	Nodal officer: Dr S K Verma	All the Scientist of Institute	Ongoing
5.	CRP on Agro-biodiversity	Ongoing activities	Dr Rajiv Ranjan Kumar	Dr D Divya Dr Anjali	Ongoing
6.	Microbial-based Agricultural Waste Management using Vermicomposting under Swachhta Action Plan	Ongoing activities	Dr Rajiv Ranjan Kumar	Dr Naresh Prasad	Ongoing

PUBLICATIONS

Research Papers:

ICAR-CIRC as lead Centre for place of work International:

1. Pande, M., Ghosh, S. K., Tyagi, S., Katiyar, R., Kumar, S., Srivastava, N., Sirohi, A.S., Sarika, Chand, N., Dhara, S.K. and Bhure, S.K and Mahajan, S. 2024. Novel Antioxidant Humanin Analogue Restores Bull Semen Cryosurvivability. *Andrologia*, 5582359 14 pages, 2024. <https://doi.org/10.1155/2024/5582359>
2. Pande, M., Kumar, S., Tyagi, S., Sirohi, A. S., Chand, N., Soni, Y. K., Mahajan, S., Saha, S., Sharma, A., Sarika, Rajoriya, J. S., Anjali, & Mohanty, A. K. (2024). Endogenous Tissue Inhibitor of Metalloproteinase-2 Levels Are Associated with High-Quality Neat Semen but Unrelated to Sperm Cryoresistance in Bulls. *Reproduction in Domestic Animals*, 59(11), e14741.

National:

1. Pande Megha, Kumar Suresh, Soni Y.K., Prasad N., Chand N., Saha S., Sarika, Arya S., Tyagi S. (2025). Cytological, Bacteriological and Antibigram Studies for the Management of Uterine Infection in Repeat Breeder Bovines. *Indian Journal of Animal Research*. 59(3): 509-514. doi: 10.18805/IJAR.B-4776.
2. Singh, J.K., Singh, P., Pande, M., Sharma, A., Kumar, S., Chand, N., Prasad, R., Saha, S., Sirohi, A.S. and Sarika (2025). Novel Insights into Androgen Hormone Dynamics and Semen Quality Response to Herbal Feed Supplementation in Breeding Bulls. *Indian Journal of Animal Research*. 1-7. doi: 10.18805/IJAR.B-5421.
3. Sirohi, A.S., Fahim, A., Katoch, S., Chand, N., Tomar, K., Verma, S.K., Singh, R., Mahajan, S., Pande, M. and Trivedi, A.K. (2024). Biochemical and Microbiological Characteristics of Indigenous and Crossbred Fresh Cow Urine. *Journal of Animal Research*. 14(02): 161-165.

Research Papers where ICAR-CIRC Scientist contributed as Co-author (Other Than Institute)

1. C.K. Faslu Rahman, **Rajiv Ranjan Kumar**, Sagar Chand, Ashok Kumar Pattanaik, Pratima Raypa, Ayon Tarafdar, Sanjod Kumar Mendiratta, Argana Ajay. Keratin-based pet food produced through proteolytic hydrolysis of chicken feather: Characterisation and palatability study. *Process Biochemistry*. 2024; 146 ():214-224.

2. Gowthaman, V., Sharma, D., Deo, C., Tiwari, A. K., **Biswas, A***. (2024). Production performance, serum lipid profile and gut health in Indian native Kadaknath chickens fed diet incorporated with liquorice root powder. *Heliyon*, 10(22): e40230 DOI: 10.1016/j.heliyon
3. Monika, M., Tyagi, J.S., Sonale, N., **Biswas, A.**, Murali, D., Sky, Tiwari, A. K., Rokade, J.J. (2024). Evaluating the efficacy of Lactobacillus acidophilus derived postbiotics on growth metrics, health, and gut integrity in broiler chickens. *Scientific Reports*, 14 (1), 24768; DOI: 10.1038/s41598-024-74078-0
4. Agashe, J.L., Deo, C., **Biswas, A.***, Sharma, D., Nampalle, M.T., Tiwari, A. K. (2024). Adequate levels of zinc and copper on turkey poult performance, immunological response, and skeletal health. *Biological Trace Element Research*, 13(6): 1-9. DOI: 10.1007/s12011-024-04257-7
5. **Biswas, A***, Deo, C., Sharma, D., Matin, A., Tiwari, A. K. (2024). Production performance, haematological parameters, serum biochemistry, and expression of HSP-70 in broiler chickens fed dietary ascorbic acid during heat stress. *International Journal of Biometeorology*, 68(1):68-43. DOI: 10.1007/s00484-023-02568-3;
6. Agashe, J.L., Deo, C., **Biswas, A**, Mukesh, N. T., Bhanja, S.K., Jadhav, S.E., Vikas, B. (2024). Effect of feeding different dietary levels of zinc and iron on growth performance immune response and haematological parameters of growing turkey poult's. *Animal Nutrition and Feed Technology*, 24(1):227-238.

Book Chapter

1. Shweta Anand, Rajesh Mandil, Rachna Varma & **Rajiv Ranjan Kumar**. (2024) Nanotechnology in Medicine: Designing, Nanoparticles for Targeted Diagnosis and Therapy. *Advances in Nanotechnology and its Application in Animal Health* Edited By Vibha Yadav, R K Joshi, D Niyogi, S V Singh and Rajesh Kumar ABS Books Publisher and Exporter, Kyrgyzstan, ISBN: 978-81-19708-62-8
2. **Rajiv Ranjan Kumar**, Shweta Anand and Punit Arora (2024). Identification of Novel Protein/Peptide Biomarkers in Meat Authentication and Development of Rapid Detection Methods in Green and Sustainable Meat Sector: Global Game Changer Edt by Vikas Pathak, Meena Goswami Awasthi, Amit Singh, Rajneesh Sirohi. *Content Vibes*. ISBN: 978-93-67550-63-2.
3. **Rajiv Ranjan Kumar**, Shweta Anand and Sagar Chand. (2024). Packaging and marketing strategies required to boost processed meat sector. In *Livelihood improvement through value addition of Animal source foods*. Edt by A K Biswas, Sagar Chand, Devendra Kumar, A R Sen, Shahaji Phand and Sushrirkha Das. E book from ICAR-IVRI, Izatnagar and MANAGE, Hyderabad. ISBN:978-81-19663-82-8.
4. Shweta Anand, Rachna Varma, Rajesh Mandil, & **Rajiv Ranjan Kumar**. (2024) Integrating Pharmacology and Omics for advancing health outcomes and enhancing livelihoods

Advances in Physiological Research in Omics Era for sustainable Animal Production and Livelihood Security under the changing climatic Scenario, Edt by A S Sirohi, Anjali, S Mahajan, M Pande, R R Kumar, N Chand and S Saha.. published by ICAR-CIRC, Meerut. 236pp ISBN No.978-81-955938-8-0

5. Breeding for multiple stress tolerance in the animal sector. 2024. Supriya Chhotaray, K Meera, KA Saravanan, Harshit Kumar, **Devara Divya**, Ashish Bahadhre. In: Book of Research and Technology advancements in agriculture. Srinivasa Rao Ch., Dhandapani A and Sanjiv Kumar, ICAR-National Academy of Agricultural Research Management, Hyderabad, India. May 2024 Pp. 748. ISBN No.: 978-93-340-3808-8.

Book /Training Manuals / Technical Bulletin:

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production” organized by Bihar Animal Sciences University, Patna and Indian Society of Animal Genetics and Breeding on November 21st-22nd, 2024 at Patna, Page 238.

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IMPORTANT COMMITTEES AND MEETINGS

QUINNEQUENIAL REVIEW TEAM (QRT) of ICAR-CIRC, Meerut

S.No.	Name	Designation	Chairman /Member
1.	Dr. C. Balachandran	Former Vice-Chancellor, TANUVAS, Chennai	Chairman
2.	Prof. B.K. Joshi	Former Director, ICAR-NBAGR, Karnal	Member
3.	Prof. G.D. Singh	Former Dean, College of Veterinary Science and A.H. DUVASU, Mathura	Member
4.	Dr. B.S. Prakash	Former ADG (ANP), ICAR HQ, New Delhi	Member
5.	Dr. A. Anand Kumar	Professor and Head Department of Veterinary Pathology, College of Veterinary Sciences SVVU, Tirupathi	Member
6.	Dr. P.S. Birthal	Director NIAP, New Delhi	Member
7.	Dr. Sushil Kumar	HoD CG&B Division	Member Secretary

The ICAR Quinquennial Review Team (QRT) conducted comprehensive evaluations of three key livestock genetic improvement programs in Gujarat and Maharashtra between July and October 2024, focusing on AICRP on Kankrej and Gir cattle and the Field Progeny Testing (FPT) of Frieswal bulls. At Livestock Research Station (LRS), Sardarkrushinagar (July 19–21, 2024), the QRT reviewed the progress of the Kankrej cattle project. The team, led by Dr. C. Balachandran, appreciated the advancements made in genetic improvement, including better herd performance, increased milk yield, and successful AI implementation across multiple bull sets. The farm maintained a herd strength ranging from 69 to 203 animals with increasing lactation performance. However, challenges such as scarcity of land for fodder, staff shortages, delayed fund release, and outdated infrastructure were highlighted. The QRT recommended the purchase of milk analyzers for field centers, increasing the number of breedable females to at least 150, simultaneous use of 10–12 bulls per set, and better semen laboratory certification to strengthen the program.

The visit to Cattle Breeding Farm (CBF), Junagadh (July 22–24, 2024) focused on Gir cattle improvement. The QRT noted the preservation of valuable century-old Gir genetics, improvement in milk yield from 2488 kg to 2950 kg, and the performance of elite cows. Key

concerns included high calf mortality (due to lion attacks and poor calf shed hygiene), overstocking, and old animal sheds. Suggestions included implementing double insemination strategies, maintaining a 60:40 milch-to-dry animal ratio, reducing age at first calving through better nutrition, and regular milk recording. Field inseminators were advised to identify elite calves for future breeding. The team, including Dr. A.K. Mohanty, emphasized the need for new infrastructure and coordinated efforts to enhance reproductive performance and farm profitability.

At BAIF Field Progeny Testing (FPT) Unit, Pune (October 4–6, 2024), the QRT reviewed the progress of Frieswal cattle development. The team appreciated the successful completion of 14 bull batches and ongoing work with batches 15 to 18. Over 3200 inseminations were carried out with a conception rate of 45%. Dr. A.K. Das advocated for the wider adoption of nominated mating with elite cows and highlighted BAIF’s readiness to produce sex-sorted semen. Farmers were encouraged to engage in dairy value addition (paneer, ghee, etc.) and commercial silage making, though constraints related to market access and labor were acknowledged. The QRT also emphasized women’s involvement in livestock management and the need for skill development.

Across all centers, the QRT, including experts like Dr. B.S. Prakash and Dr. B.K. Joshi, appreciated the progress while strongly recommending infrastructure modernization, enhanced field-level data recording, genetic selection refinement, and greater farmer-centric interventions to sustain and accelerate cattle improvement efforts.

Meeting Picture to be attached

QRT Meeting July and October 2024

RESEARCH ADVISORY COMMITTEE (RAC) of ICAR-CIRC, Meerut for the (2020-23)

Rule Position	Designation	Name with Address
71A(a)1	Chairman	Dr. R.K. Sethi, Former Director, ICAR-CIRB, Hisar, Haryana
71A(a)2	Member	Dr. Radhakrishnan L. Professor and Head, Dept. Of Animal Nutrition, Madras Veterinary College, Chennai
		Dr. Vineet Bhasin, Former Principal Scientist, ICAR HQ, New Delhi
		Dr. Prya P.M., Professor and Head, Dept. of Veterinary Microbiology, CUAS Mannuthy, KVASU, Kerala
		Dr. Harendra Gupta, Former JD, IVRI-Izatnagar
		Dr. Latha Sabikhi, Former Head (Dairy Technology), ICAR-NDRI, Karnal
		Dr. Shalander Kumar, ICRISAT, Hyderabad
71A(a)3	Member	Dr. A.K. Mohanty Director, ICAR-CIRC, Meerut
71A(a)4	Member	ADG (AP&B) ICAR, New Delhi
71A(a)5	Member	Sh. Shashank Bhatia Bhatia Farm Jugrunagar Tahsil- Baheri, Jila Bareilly, nominated vide order dated 08.11.2021 till 07.11.2024
71A(a)5	Member	Dr Satyendra Nath Pryagraj, Uttar Pradesh, IMC Member
71A(a)6	Member Secretary	Dr. Sushil Kumar, Principal Scientist & Head (CG&B division) ICAR- CIRC, Meerut

24th RAC Meeting of ICAR-CIRC, Meerut

The third meeting of XXIV Research Advisory Committee of ICAR-Central Institute for Research on Cattle, Meerut was held on 16th and 17th May 2024. The meeting was chaired by Dr.

R. K. Sethi, Former Director, ICAR-Central Institute for Research on Buffalo, Hisar. The RAC comprised eminent scientists from across the country, including Dr. Radhakrishnan L., Dr. Vineet Bhasin, Dr. Priya P. M., Dr. Harendra Gupta, Dr. G. K. Gaur, and Dr. Satyendra Nath, along with the Director and senior scientists of ICAR-CIRC.

The RAC reviewed the outcome of the research projects. Numerous topics were discussed, including advancements in cattle genetics, reproduction, nutrition, disease management, and sustainable farming practices. Chairman Dr. R. K. Sethi emphasized the need to prioritize research based on the available scientific manpower and proposed focusing on selective breeding, genomic selection, and the use of Assisted Reproductive Technologies (ARTs) for genetic improvement of cattle. He stressed the importance of promoting Indigenous breeds producing A2 milk, especially under ICAR's vision to eliminate non-descript cattle. He commended the ICAR-CIRC for its significant contributions to the field and encouraged the scientists and researchers to continue their pursuit of excellence.

Dr. G. K. Gaur, ADG (APB), ICAR-HQ, appreciated the progress of the Frieswal project and advocated for the inclusion of more Indigenous breeds under the Indigenous Breed Project aiming for a significant increase in their milk yield. He recommended for collaboration with other institutes and attracting students to address the issue of staff shortages, and funding constraints. Other committee members highlighted the potential of CRISPR, ovum pickup-IVF technologies, nutritional strategies, and therapeutic value of cow-origin products. Special attention was given to initiating studies on methane emissions, residual feed intake, and infertility management through a proposed "Prajananvardhan" initiative. The committee also reviewed infrastructure developments at the new Babugarh campus and recommended adopting sustainable designs, solar energy solutions, and improved biosecurity measures.

Dr. Mohanty expressed gratitude to the Chairman and all RAC members for their constructive suggestions. The meeting concluded on a positive note, reaffirming the institute's commitment to impactful and farmer-centric research in cattle husbandry and genetic improvement.



RAC Meeting in progress at ICAR-CIRC, Meerut on 16th – 17th May, 2024

Institute Research Council (IRC), ICAR-CIRC, Meerut

The IRC meeting for the year 2024-25 was conducted on 6th and 7th August 2024 under the chairmanship of Dr. A. K. Mohanty, Director ICAR-CIRC, Meerut. Dr. Putan Singh, Emeritus Professor, ICAR-IVRI, Izatnagar, Dr A K Dang, HoD, Animal Physiology and Reproduction, ICAR-NDRI, Karnal and Dr Vikas Vohra, HoD, AG&B, ICAR-NDRI, Karnal were invited subject experts and all the scientists of the Institute joined the two days meeting. The meeting started with the welcome address by Dr Rajiv Ranjan Kumar, I/C PME and Member Secretary, IRC. A total of 33 projects consisting of 2 AICRP sub projects, 13 institutional, 4 inter-institutional, 4 externally funded, 3 service and 7 new research project proposals were scheduled for discussion.

At the outset, Dr. A.K. Mohanty provided a comprehensive overview of ICAR-CIRC, detailing its vision, mission, and mandate. He emphasized the institute's vision to become a leading global center in cattle research, focusing on sustainable livestock development. The mission is to enhance cattle productivity through innovative research, technology development, and effective dissemination. He also highlighted the mandate, which includes research on genetic improvement, nutrition, health, and management practices. He stressed the institute's role in addressing industry challenges and supporting farmers, aiming to make significant contributions to the livestock sector and national economy.

Dr. A.K. Mohanty, Chairman IRC during his opening remarks informed that the ICAR-CIRC is a unique research institute of its own as it deals exclusively on cattle, an important livestock species of the country. He urged the scientists to take up stakeholder-oriented research problems well covered within the mandated areas of the Institute. The research problems should be unique, well defined and holistic in nature without any overlapping with other institutions like IVRI and NDRI. He further stressed on 3 P's namely publications, patents and products to fulfill the requirement of one scientist one product concept proposed by the Hon'ble DG, ICAR and Secretary DARE.

He also informed that the semen station of the Institute will be strengthened with the State of the arts facilities utilizing the DAHD, GoI fund and along with that a sanctuary covering the 53 recognized indigenous cattle breeds can also be established at the new campus of the Institute. He further urged for the necessity of developing the coffee book on cattle genetic resources of Indigenous and other important exotic cattle breeds. He also insisted to explore collaborations for undertaking modern research covering biotechnology, genomics, and nutritional techniques.

Dr. Putan Singh delivered the opening remarks, thanking Dr. A.K. Mohanty for his insightful presentation. He emphasized the importance of scientists submitting more projects for external funding, stating that such efforts are crucial for the institute's growth. Dr. Singh pointed out that funding opportunities are available not only through government agencies but also from institutions like NABARD and other banks, which can significantly support research and development initiatives.

Dr. A.K. Dang suggested focusing on societal development by designing research projects that specifically target women farmers. He emphasized the importance of engaging in externally funded and multidisciplinary projects, highlighting that such initiatives are crucial for addressing broader societal challenges and advancing the institute's impact on rural communities.

Dr. Vikas Vohra emphasized on prioritization of research activities, stressing the importance of focusing on specific, streamlined areas when designing projects. He urged that future research projects should be more closely aligned with genetics, which is a key focus of the institute.

Consequently, the presentations started with the AICRP on Cattle followed by the Divisions of Cattle Genetics and Breeding, Cattle Physiology and Reproduction and Cattle Nutrition and Management.

Dr. Rajiv Ranjan along, I/C PME along with Mr. Punit YP-II, ITMU/PME, coordinated the presentation by different scientists about the ongoing research and development activities carried out under respective research projects, All the research projects were discussed in detail, scientists were urged to come out with tangible output and simultaneously refinement in technical program as per constraints under each project were suggested. A total of new six research proposal were approved, and four institute funded projects were declared complete with note of submission of RPP-III.



Institute Research council meeting in progress at ICAR-CIRC, 6-7th August 2024

INSTITUTE MANAGEMENT COMMITTEE (IMC)

S.NO.	Nominated officers/Persons	Designation
1	Director, ICAR- CIRC, Meerut (UP)	Chairman
2	Dr. Prasidh Narayan Singh Director, Animal Husbandry Badshahbag, Lucknow	Member
3	Dr. Neeraj Singhal, Director, Animal Husbandry Department of Animal Husbandry, Pashudhan Bhawan Mothrowala-248115 Dehradun (Uttarakhand)	Member
4	Dr. K.K. Singh Vice Chancellor sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut-250001	Member
5	Sh. Shashank Bhatia, Bhatia Farm, jugrunagr, tahsil Baheri, jila, Bareilly w.e.f. 08.11.2021	Member

6	Shri Satendra Nath 68/5, Indraprasth Stainley Road, Mumfordganu, prayagraj-211002	Member
7	Dr. Rakesh Pundir, Head (AGR), ICAR-NBAGR, Karnal	Member
8	Dr. Ravi Kumar Gandham Head, ICAR-NBAGR, Karnal	Member
9	Dr. Gyanendra Singh, Head, ICAR-IVRI Izatnagar	Member
10	Dr. Ashok Verma, Former Head, ICAR-IVRI Izatnagar	Member
11	ADG (AP&B), ICAR, New Delhi-110012 Dr. G.K. Gaur	Member
12	Finance & Accounts officer, ICAR-CIRC, Meerut	
13	Administrative Officer, ICAR- CIRC, Grass Farm Road, Meerut Cantt-250001 (UP)	Member Secretary

The 32nd Meeting of the Institute Management Committee (IMC) of ICAR-Central Institute for Research on Cattle (CIRC), Meerut, was held on 27th December 2024 under the chairmanship of Dr. Ashok Kumar Mohanty, Director, ICAR-CIRC. The meeting was attended by distinguished members from ICAR institutes, state Animal Husbandry departments, academic institutions, and farmer representatives. Dr. Mohanty welcomed the members and briefed them on the ongoing research and development initiatives aimed at breed improvement and sustainable livestock management. The IMC appreciated the progress achieved and reviewed actions taken on previous recommendations.

During discussions, Dr. Neeraj Singhal and Dr. M.K. Agarwal suggested exploring the procurement of pure Jersey, Holstein Friesian (HF), or Red Sindhi cattle from Kalsi Farm, Uttarakhand, with preference for heifers to strengthen the breeding program. For the upcoming Babugarh campus, members emphasized the need for modern infrastructure, recommending the provision of firefighting systems and solar panels. The idea of collaborating with CMU-accredited laboratories for the production of sexed semen was proposed to enhance genetic gains. In line with emerging market trends, Dr. Mohanty highlighted the potential of research on waste-to-wealth ventures using cow dung and urine and proposed exploring therapeutic applications in collaboration with Ayurveda colleges, citing successful authentication work with Patanjali.

The committee approved the purchase of a multi-utility vehicle, e-rickshaw, and e-scooter to improve operational efficiency. It also endorsed the conversion of two Type-IV quarters into a guest house until the shift to Babugarh. Rationalization of livestock procurement from 40 to 20 animals was advised for quality enhancement. Dr. A.K. Das underscored the importance of adopting herd management software for better data recording and farm management. The meeting concluded with a commitment to act promptly on all suggestions and to continue the institutes momentum.



Institute Management Committee meeting in progress at ICAR-CIRC, 6-7th August 2024

INSTITUTIONAL BIO-SAFETY COMMITTEE (IBSC)

Dr. A K Das, Principal Scientist, ICAR-CIRC, Meerut	Chairman
Dr. Pallab Chaudhuri, Joint Director, ICAR-IVRI, Bengaluru	DBT Nominee
Dr. Naimi Chand, Principal Scientist, ICAR-CIRC, Meerut	Member Secretary

Dr. Indrajit Ganguly, Principal Scientist ICAR-NBAGR, Karnal	Outside expert
Dr. Monica Sharma, Professor and Head Pharmacology, LLRM Medical College, Meerut	Biosafety Officer
Dr. A S Sirohi, Principal Scientist, ICAR-CIRC, Meerut	Internal Expert
Dr. Rajiv Ranjan Kumar, Principal Scientist, ICAR-CIRC, Meerut	Internal Expert
Dr Sumit Mahajan, Scientist, ICAR-CIRC, Meerut	Internal Expert

Institutional Bio Safety Committee Meeting

The IBSC meeting was held on 27.09.2024 at 11.30 AM. Two research projects were submitted for approval by the IBSC. The committee examined the projects and discussed for any biosafety issue and approved accordingly. The medical surveillance report submitted by the scientists and technical officers involved in the laboratory work were evaluated by Biosafety officer and found satisfactory. Proceedings of the meeting and medical surveillance report uploaded on the website of the Department of Biotechnology, GOI, New Delhi.



Institutional Bio safety Committee Meeting in progress at ICAR-CIRC, Meerut on 27.09.2024

Institutional Animal Ethics Committee (IAEC) Meeting

Dr. A K Das, Principal Scientist, ICAR-CIRC, Meerut	Chairman
Dr. Bal Gangadhar Roy, Scientist G, DRDO, New Delhi	Main Nominee, CPCSEA
Dr. Harshit Verma, Asstt Professor, SVPUA&T, Meerut	CPCSEA, Member outside institute
Smt. Deepa Saini, Social Worker, Meerut	Socially aware Nominee, CPCSEA
Dr K B Patel,	Link Nominee, CPCSEA
Dr. A S Sirohi, Principal Scientist, ICAR-CIRC, Meerut	Internal Expert
Dr. Rajiv Ranjan Kumar, Principal Scientist, ICAR-CIRC, Meerut	Scientist from different biological discipline
Dr. Naimi Chand, Principal Scientist, ICAR-CIRC, Meerut	Veterinarian
Dr Sumit Mahajan, Scientist, ICAR-CIRC, Meerut	Internal Expert
Dr Sushil Kumar, Pr Scientist and HoD, CGB, Meerut	Scientist from different biological discipline
Dr Megha Pande, Scientist, ICAR-CIRC, Meerut	Member Secretary

The meeting of the Institutional Animal Ethics Committee (IAEC) at ICAR-Central Institute for Research on Cattle, Meerut, was convened on **October 19, 2023**. During the meeting, the IAEC reviewed and deliberated **on three** new research proposals, recommending them for approval in accordance with the guidelines set by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA). **Dr. Bal Gangadhar Roy**, the CPCSEA's main nominee, provided an overview of the regulations under the Prevention of Cruelty to Animals (PCA) Act, CPCSEA, and IAEC. He highlighted recent advancements in animal welfare practices, standard operating procedures (SOPs) for handling large animals, and the critical need for meticulous record-keeping. Following this, the **Member Secretary** introduced **Form-B** for the **three** new research proposals, which were thoroughly examined and discussed in detail. The committee also conducted an inspection of the institute's animal house and various laboratories to ensure that animal care and management were in strict adherence to CPCSEA norms. The IAEC expressed satisfaction with the institute's animal house facilities, noting that they were well-maintained and fully compliant with CPCSEA guidelines.

Meeting Picture to be attached

Institutional Animal Ethics Committee (IAEC) Meeting in progress at ICAR-CIRC, Meerut on **19.10.2023**

Meeting with Sikkim Livestock Development Board

A virtual meeting between ICAR-Central Institute for Research on Cattle (ICAR-CIRC), Meerut, and the Sikkim Livestock Development Board (SLDB) was held on 13th November 2024 to strengthen natural and sustainable farming practices in Sikkim through the enhancement of local cattle breeds and varieties. The meeting, attended by Dr. A.K. Mohanty, Director, ICAR-CIRC, and representatives from SLDB including Dr. Karma Doma Bhutia and Dr. Prabina Lama, aimed to build on discussions initiated during the 26th Regional Committee Meeting. The focus was on integrating traditional knowledge with modern scientific approaches to promote indigenous cattle breeds such as Siri, which align with Sikkim's commitment to organic and chemical-free agriculture.

ICAR-CIRC highlighted its technical expertise in sustainable agriculture, cattle breeding, nutrition, and reproductive technologies. The Institute proposed promoting the use of local breeds like Siri cattle, which are better adapted to Sikkim's high-altitude conditions and support natural farming through draft power and organic manure production. Additionally, ICAR-CIRC recommended vermicomposting as a sustainable waste-to-wealth solution that could enhance soil fertility while reducing chemical fertilizer dependency. The Institute also offered to conduct awareness campaigns and training programs to empower farmers with knowledge of vermicomposting, cattle management, and productivity enhancement strategies, particularly under the North Eastern Hill (NEH) scheme.

SLDB raised concerns about low productivity in indigenous breeds, which ICAR-CIRC addressed by offering support in milk recording analysis, genetic selection, and exploration of the bio-therapeutic potential of Siri cattle's milk for value addition. A proposal for a two-day exposure visit for SLDB officials and farmers to ICAR-CIRC was well-received, with both organizations expressing commitment to foster sustainable farming and cattle productivity in Sikkim.

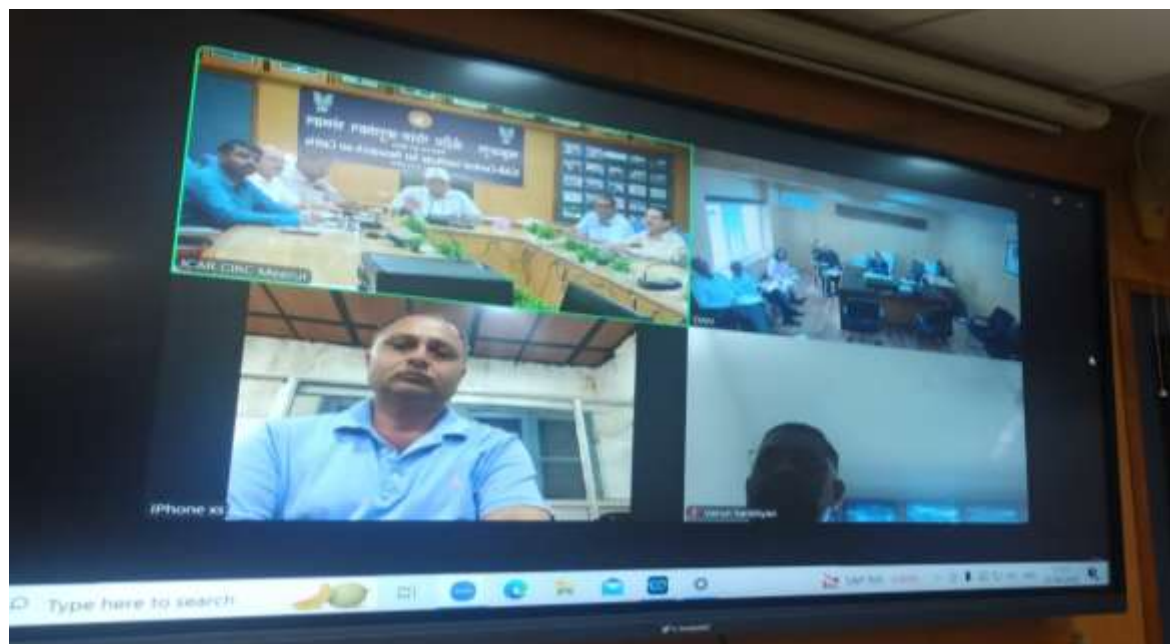


Virtual Meeting with Sikkim Livestock Development Board

Meeting with Department of Animal Husbandry, Himachal Pradesh

An online meeting between ICAR-Central Institute for Research on Cattle (ICAR-CIRC), Meerut, and the Department of Animal Husbandry, Himachal Pradesh, was held on 23rd August 2024 to explore collaborative efforts aimed at enhancing cattle breeding and productivity in the state. The meeting, attended by Dr. A.K. Mohanty, Director, ICAR-CIRC, along with senior scientists and officials from both organizations, set the groundwork for strengthening breeding programs through technical backstopping and advanced reproductive technologies. ICAR-CIRC introduced its significant achievements in developing and propagating the Frieswal breed—a high-yielding synthetic cross of Holstein Friesian and Sahiwal—highlighting its adaptability to diverse climatic conditions. The Department of Animal Husbandry shared details of the existing breeding infrastructure, including semen production at Palampur and Solan, and expressed interest in revisiting the state's 2018 breeding policy to incorporate newer genetic advancements. The state aims to enhance cattle productivity while conserving indigenous breeds suited to the local terrain. Dr. Sushil Kumar from ICAR-CIRC detailed the benefits of introducing Frieswal genetics and proposed supplying Frieswal semen for field trials in low and mid-hill regions. ICAR-CIRC also offered its expertise in advanced reproductive technologies such as sexed semen, multiple ovulation and embryo transfer (MOET), and genomic selection to accelerate genetic gains. The Department expressed keen interest in receiving a detailed proposal for policy revision and practical implementation.

Both parties agreed on the importance of organizing follow-up meetings to finalize the collaboration and plan field evaluations. ICAR-CIRC further committed to providing training to veterinarians and technical staff from Himachal Pradesh. The meeting concluded with optimism, highlighting a shared vision to enhance livestock productivity through science-based, locally adapted solutions.



Virtual Meeting with Department of Animal Husbandry, Himachal Pradesh

Meeting between ICAR-CIRC and Vice Chancellor - SKUAST-K

Proceeding to be attached



Virtual Meeting with Vice Chancellor of SKUAST-K

Sensitization Workshop on Prevention of Sexual Harassment at Workplace

In observance of the 'Sexual Harassment at Workplace Prevention Week,' a sensitization workshop was organized on **9th December 2024** by the Internal Committee (IC) of ICAR-Central Institute for Research on Cattle (ICAR-CIRC), Meerut, under the directives of the Ministry of Women and Child Development. The workshop aimed to raise awareness about the provisions and compliance requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013 (POSH Act).

In his inaugural address, Dr. A. K. Mohanty, Director, ICAR-CIRC, emphasized that sexual harassment is an issue that can affect everyone, including young boys, and underscored the need for a respectful and inclusive work environment. He highlighted that fostering a healthy and supportive atmosphere for all individuals is essential, and any behavior that undermines personal

dignity or tarnishes the institute's reputation must be strongly discouraged. Dr. Mohanty described the workshop as a vital step towards reinforcing the institute's commitment to preventing and addressing harassment while upholding dignity and respect for all, especially women employees.

Dr. Megha Pande, Scientist and Chairperson of the Internal Committee, spoke about the significance of awareness and strict compliance with the POSH Act. She elaborated on the available mechanisms for grievance redressal, including the updated SHe-Box Portal, and shared strategies for effective resolution of complaints. Key topics covered during the workshop included an overview of the POSH Act, the composition and functioning of Internal Committees, online complaint processes, and proactive measures to ensure a safe, respectful, and inclusive workplace.

The workshop witnessed active participation from scientists, officers, staff members, Senior Research Fellows (SRFs), Young Professionals (YPs), and contractual employees. The attendees appreciated the initiative for its focus on promoting awareness, fostering mutual respect, and ensuring a secure work environment for all.



Sensitization Workshop on Prevention of Sexual Harassment at Workplace

XXI Annual Review Meeting of AICRP on Cattle

The XXI Annual Review Meeting of the All India Coordinated Research Project (AICRP) on Cattle took place on February 29, 2024, at the NAAS Complex, New Delhi, to assess the progress made during 2022-23. Dr. Sushil Kumar, Project Coordinator, welcomed the attendees, followed by an insightful presentation by Dr. A.K. Mohanty, who outlined the institute's achievements and highlighted the enhanced autonomy under AICRP and advancements in genomic technologies for cattle breeding.

The Chairman, Dr. Bhata, DDG (Animal Sciences), ICAR, released the Status Paper on AICRP on Cattle and emphasized the importance of the program in India's cattle breeding efforts. He expressed concerns regarding data quality, budget utilization, and the need for active involvement

of postgraduate students in research. Dr. G.K. Gaur stressed the importance of improving bull selection through precise genetic evaluation.

Key discussions focused on semen production, integration of sex-sorted semen, and revisions to technical programs. The meeting concluded with a vote of thanks from Dr. Mohanty, calling for improved outcomes in the upcoming year.



XXI Annual Review Meeting of AICRP on Cattle

National Brainstorming Session: Artificial Insemination and Cattle Germplasm Improvement

On April 19, 2024, the ICAR-Central Institute for Research on Cattle in Meerut hosted a pivotal National Brainstorming Session focused on the theme “Present and Future of Artificial Insemination (AI) for Improvement of Cattle Germplasm: CIRC Perspective.” This important gathering convened thirty leading experts from six prominent institutions to address critical challenges in the field of artificial insemination.

Chaired by Professor (Dr.) A.K. Srivastava, Vice Chancellor of U.P. Pt. Deen Dayal Upadhyaya Veterinary Science University, the session highlighted essential topics, including enhancing AI coverage, semen quality issues, and breed-specific AI strategies. Professor Srivastava underscored the necessity for ongoing dialogues to bolster AI's role in India's dairy sector, integrating aspects such as vaccination, nutrition management, and technician training. Among the distinguished participants were Dr. Vikas Pathak, Dean of COVAS at DUVASU, and other notable experts from ICAR institutions and universities. Their collaborative discussions emphasized the urgency of optimizing AI techniques and enhancing infrastructure and policies for sustainable cattle farming. The session began with a welcoming address by Dr. A.K. Mohanty, Director of ICAR-CIRC, who shared insights on the center's ongoing activities and future plans. Dr. Suresh Kumar D.S. presented the National Status of Artificial Insemination in Cattle, while Dr. Sushil Kumar concluded the event with a vote of thanks. The session, coordinated by Dr. Megha Pande, set the stage for continued collaboration toward maximizing the potential of artificial insemination in cattle improvement across India.



Brainstorming Session: Artificial Insemination and Cattle Germplasm Improvement on 19.04.2024

Brainstorming Session Conducted on “CIRC Way Forward for ICAR CIRC in 21st Century”

The brainstorming session featured an interactive discussion on the development of **ICAR-CIRC’s upcoming Babugarh campus**. **Dr. Shiv Prasad Kimothi**, Member, Agricultural Scientists Recruitment Board (ASRB), shared his vision for establishing state-of-the-art research facilities at the new campus. The proposed infrastructure will include **advanced reproductive technology laboratories** and **animal genetics centres**, aimed at significantly enhancing the institute’s research capabilities. These developments are expected to position the new campus as a **model for agricultural research and innovation**, strengthening ICAR-CIRC’s role as a leader in livestock research and development.



Dr. Shiv Prasad Kimothi interacting with scientists on way forward for ICAR-CIRC in 21st century

Brainstorming Session Conducted at ICAR-CIRC on First Synthetic Milch Breed of Cattle: “Frieswal”

A brainstorming session was organized at ICAR-Central Institute for Research on Cattle (ICAR-CIRC), Meerut, on 21st October 2024 on the topic “Strategies for Utilisation of Frieswal—the First Synthetic Milch Breed of Cattle—and Genetic Improvement of Indigenous Cattle Resources.” The programme commenced with a visit by dignitaries to various laboratories of the institute. On this occasion, Dr. Raghavendra Bhatta, Deputy Director General (Animal Sciences), ICAR, New Delhi, along with other distinguished guests, inaugurated three newly established research laboratories: Milk Processing cum Incubation Laboratory; Tissue Culture and Biochemistry Laboratory; and Veterinary Clinical Laboratory.

The formal session began with a welcome address by Dr. A. K. Mohanty, Director, ICAR-CIRC, Meerut, followed by a detailed presentation on the journey of developing India’s first synthetic milch breed of cattle—Frieswal—delivered by Dr. Sushil Kumar, Head, Division of Cattle Genetics and Breeding. Frieswal is a unique synthetic breed carrying 62.5% Holstein Friesian and 37.5% Sahiwal blood, developed with the support of 47 military dairy farms across India. Cows of this breed have demonstrated the ability to yield over 4000 litres of milk in a standard lactation period of 305 days, with an average milk fat content of around 4%. These animals are well-suited to diverse agro-climatic conditions of the country, and the breed has been officially registered as India’s first Synthetic Milch Cattle Breed with ICAR-NBAGR, Karnal. The session was chaired by Dr. Raghavendra Bhatta, Deputy Director General (Animal Sciences), ICAR, New Delhi, and was attended by several eminent dignitaries, including Dr. A. K. Mishra, Former Chairman, ASRB, New Delhi; Dr. Nitin V. Patil, Hon’ble Vice Chancellor, Maharashtra Animal & Fishery Sciences University (MSFSU), Nagpur; Dr. G. K. Gaur, Assistant Director General (Animal Production & Breeding), ICAR, New Delhi; Dr. B. P. Mishra, Director, ICAR-NBAGR, Karnal; Dr. B. R. Gulati, Director, ICAR-NIVEDI, Bangalore; Dr. V. K. Saxena, Director (Research), Bihar Animal Sciences University (BASU), Patna; Dr. Nitin Kurkure, Director (Research), MSFSU, Nagpur; Dr. R. K. Pundir, Principal Scientist & Head (Animal Genetic Resources), ICAR-NBAGR, Karnal; Dr. T. V. Raja, Principal Scientist, ICAR-NDRI, Karnal; Dr. Arjava Sharma, Former Director, ICAR-NBAGR, Karnal; Dr. Birham Prakash, Former Director, ICAR-CIRC, Meerut; Dr. Rajendra Prasad, Former Director, ICAR-CIRC, Meerut; and Dr. Shrikant Tyagi, Former Director, ICAR-CIRC, Meerut, along with all the Heads of Divisions, scientists, and staff of ICAR-CIRC, Meerut.

All the scientists involved in the development of the Frieswal breed shared their valuable experiences and perspectives. Participants actively contributed expert opinions on the future strategies for the effective utilisation of Frieswal cattle for improving the productivity of low-yielding cattle populations across the country. In recognition of their significant contributions, all the scientists who played a role in the development of the Frieswal breed were honoured with mementoes as a token of appreciation for their dedication and sincere efforts.

In his concluding remarks, Dr. Raghavendra Bhatta congratulated all the scientists, contributors, and the entire team for their outstanding efforts in the development of the Frieswal breed and highlighted the importance of continued research and collaboration for the genetic improvement of cattle in India. The programme concluded with a formal vote of thanks delivered by Dr. Rajiv Ranjan Kumar, In-Charge, PME, expressing gratitude to all dignitaries, participants, and organisers for their valuable presence and contributions.



Brainstorming Session & Inauguration of 3 new Laboratories at ICAR CIRC on 21.10.2024

Journals Club Meet:

S. No.	Date of Journal's Club Meet	Title of Presentation	Presented By
1	05.02.2024	Application of Proteomics to understand lactation function in Bovines	Dr A.K. Mohanty
2	06.03.2024	Application and Prospects of ARTs in Cattle	Dr Suresh Kumar D.S.
		Designing of cattle and mice SgRNA constructs and testing editing in mice embryonic stem cell and embryo	Dr Divya Devara
3	16.04.2024	Application of Genomic Selection in Cattle	Dr Sushil Kumar
4	30.04.2024	Climate Change and Livestock: Impacts, Adaptation and mitigation	Dr. A. Biswas
5	06.06.2024	Science and Scientists	Dr Laxmi Chand, Prof. & Head, Animal Biochemistry, GBPUA&T, Pantnagar
6	02.08.2024	Dietary Influence on milk fat dietary cows	Dr Pramod Singh
7	04.09.2024	Nutrient Requirements for different categories of Cattle	Dr S.K. Verma

8	01.10.2024	Sustainable utilization of Indigenous Cattle Genetic Resources	Dr D.K. Sadana Former HoD & PS AG&R, ICAR-NBAGR, Karnal
9	03.10.2024	Precision dairy farming: An Introduction	Dr. A.S. Sirohi
10	13.12.2024	R&D Sector Challenges in recent Scenarios	Dr Ravinder Kumar

Common Events/ Meetings organized/ arranged, at ICAR-CIRC Meerut

S. No	Name of the Event	Duration
1.	ITMU Workshop on IPR Issues	16.01.2024
2.	Interaction with 21 days winter school participants	02.03.2024
3.	Professional attachment training of Dr Yallapa M. Semagond	19.03.2024
4.	Meeting on comprehensive guide for the foreign visit of scientists/ officials of ICAR	03.04.2024
5.	Review Meeting of SMD (Extension, Horticulture and Animal Science)	05.04.2024
6.	Meeting on the ecoregional working group and Presentation of ARMS 2.0 Software	12.04.2024
7.	National Brainstorming session “Present and future of artificial Insemination for improvement of cattle germplasm: CIRC Perspective”	19.04.2024
8.	World Intellectual Property Day celebration	26.04.2024
9.	Meeting on Viksit Bharat with respect to various commodities like rice, wheat, maize, oil seed, pulses, meat, fruit crops, vegetable crops, mushroom, potato and tuber crops	01.05.2025
10.	International Yoga Day	21.06.2024
11.	96 th ICAR foundation & Technology Day Programme	16.07.2024
12.	SOC Meeting	09.08.2024
13.	Virtual Meeting with SUKAST-K, Srinagar	20.08.2024
14.	Virtual Meeting with Department of Animal Husbandry, Himachal Pradesh State	23.08.2024
15.	IRC Meeting	06.08.2024 to 07.08.2024
16.	QRT Meeting	19.07.2024 to 24.07.2024 & 04.10.2024 to 06.10.2024
17.	Online meeting to discuss Modality for annual day celebration	07.10.2024
18.	Meeting with Sikkim Livestock Development Board	13.11.2024

19.	ICAR – CIRC Foundation Day celebration	03.12.2024
20.	Institute Management Committee Meeting	27.12.2024

Institute Technology Management Unit (ITMU)

The Institute Technology Management Unit (ITMU) was set up in 2008 under the ICAR plan scheme titled “Intellectual Property Management and Transfer/Commercialization of Agricultural Technology Scheme (Up-scaling of the existing component, i.e., Intellectual Property Rights (IPR) under the ICAR Headquarters Scheme on Management and Information Services),” with funding from ICAR. Later, the ITMU project was renamed as the “National Agricultural Innovation Fund (NAIF).” ITMU serves as a facilitation and support unit responsible for identifying emerging technologies and managing the institute’s Intellectual Property (IP) portfolio. The unit examines and processes cases related to patent applications, addresses matters concerning the IP regime and technology transfer, and functions under the governance of the Institute Technology Management Committee (ITMC) in accordance with ICAR policy guidelines.

Objectives:

- To handle all matters related to Intellectual Property (IP) protection, maintenance, transfer, and commercialization at the institute level, in line with ICAR guidelines and any subsequent administrative or policy decisions issued by ICAR from time to time.
- To seek case-specific advice or assistance from the Zonal Agro-Technology Management Centres (ZTMCs) at the zonal level of ICAR headquarters, as needed, to achieve the first objective.
- At the institute level, the Institute Technology Management Unit (ITMU) is established to manage and process all Intellectual Property Rights (IPR) related matters, which include:
 - Filing patents for the Institute’s technologies
 - Commercialization of technologies developed by the Institute
 - Handling consultancy-related matters
 - Organizing and managing training programmes conducted by the Institute
 - Securing copyrights for research and technical publications
 - Registration of germplasm
 - Addressing all other Intellectual Property (IP) related matters

The Institute Technology Management Committee at ICAR-CIRC was constituted as for the guidelines of ICAR to facilitate the process of all Intellectual Property (IP) developed by the Institute Scientists.

1. Dr. A. K. Mohanty, Director ICAR-CIRC **as Chairman**
2. Dr. Suresh Kumar, PS, Animal Reproduction & Head CP&R Division (Senior most Head of Division) **as Member**
3. Dr. Sushil Kumar, PS, Animal Genetics & Breeding & Head CG&B (Technical Expert from Institute) **as Member**

4. Dr. Ajayvir Singh Sirohi, PS, Livestock Production & Management (Technical Expert from Institute) **as Member**
5. Dr. Ravinder Kumar, PS, Animal Genetics & Breeding (Technical Expert from Institute) **as Member**
6. Mrs Vidisha Garg, Attorney, Anand and Anand, Partner/ Patents Protection and Contentious (IPO & IPAB) IPR Expert (outside ICAR) **as Member**
7. Dr. Rajiv Ranjan Kumar, PS (LP&T) and In charge PME Cell **as Member**
8. Dr. Sumit Mahajan, PI NAIF Project & I/C ITMU **as Member Secretary**

During the period 3 ITMC meeting were organized to discuss the technology submitted by scientists of the institute, inter institution and field validation, of technology and submission of report and technologies to ICAR head quarter for certification and to Agrinnovate Ltd for transfer to commercial houses.

1	ITMU Workshop on IPR Issues	16/01/2024
2	National Workshop on “Awareness on Intellectual Property Rights (IPRs) and its Management”	18/03/2024
3	Technology day celebration on 96 th foundation day of ICAR	16/07/2024

During the year 2024 a total of 2 copy rights, 3 design applications were filled out of which 2 Design patent were granted and one copyright and design patent was under scrutiny. Apart from this unit perused the cases related to various IPR issues and attended the hearing against the patent application. Three agreement for obtaining IPR (Form-III) application under Section 6 of the Biological Diversity Act, 2002 read with Rule 18 of the Biological Diversity Rules, 2004 was executed with National Biodiversity Authority of India to obtain IPR. The unit also helps in providing support for linkage with various SAUs, SVUs and ICAR Institutions across the country and helps in materization and signing of 5 MoUs with different univ (Five) ersities of the country.

Agency / Institution	Purpose	Commencement Date
Shobhit University	For Training and Educational Research Work activities	12.09.2024
Maharashtra Animal and Fishery Sciences University, Nagpur	For Training and Educational Research Work activities	21.10.2024
Lovely Professional University, Phagwara Punjab	For Training and Educational Research Work activities	24.10.2024

Bihar Animal Science University, Patna Bihar (Umbrella MoU)	For Dissemination of Scientific Information and Technology for Cattle Improvement and Management	11.12.2024
Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg	AICRP on Cattle	20.12.2024



MoU Signed with Shobhit University, Meerut



“Milking pail and vessel set”

Fig: Certificate of the Design registered to the institute for “Milking pail and vessel set”

 INTELLECTUAL PROPERTY INDIA Ministry of Commerce and Industry, Government of India				ORIGINAL क्रम सं/ Serial No. : 177684 	
पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India					
डिजाइन के पंजीकरण का प्रमाण पत्र Certificate of Registration of Design					
डिजाइन सं. / Design No.	416849-001				
तारीख / Date	14/05/2024				
परस्परिकता तारीख / Reciprocity Date*					
देश / Country					
प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो MILKING PAIL AND VESSEL SET से संबंधित है, का पंजीकरण, श्रेणी 07-07 में Icar-Central Institute For Research On Cattle के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है। Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 07-07 in respect of the application of such design to MILKING PAIL AND VESSEL SET in the name of Icar-Central Institute For Research On Cattle.					
डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यायीत प्रावधानों के अनुसरण में। In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.					
जारी करने की तिथि Date of Issue	08/08/2024 				
महानिदेशक पेटेंट, डिजाइन और व्यापार चिह्न Controller General of Patents, Designs and Trade Marks					
*परस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति दी गई है तथा देश का नाम। डिजाइन का स्वतंत्रिकर पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अंतर्गत, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है। The reciprocity date (if any) which has been allowed and the name of the country. Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years. This Certificate is not for use in legal proceedings or for obtaining registration abroad.					

Fig: Certificate of the Design registered to the institute for “Dung Cake Maker”



ORIGINAL

कम. सं./ Serial No., 194198



पेटेंट कार्यालय, भारत सरकार **The Patent Office, Government Of India**
डिजाइन के पंजीकरण का प्रमाण पत्र | **Certificate of Registration of Design**

डिजाइन सं. / Design No. : 439725-001
तारीख / Date : 06/12/2024
परस्परिकता तारीख / Reciprocity Date* :
देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **DUNG CAKE MAKER** से संबंधित है, का पंजीकरण, श्रेणी 08-99 में Icar-Central Institute For Research On Cattle के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 08-99 in respect of the application of such design to **DUNG CAKE MAKER** in the name of Icar-Central Institute For Research On Cattle.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अख्यवीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

जारी करने की तिथि : 11/03/2025
Date of Issue



अभिषेक
अभिषेक सिंह

सहनिर्देशक पेटेंट, डिजाइन और वाणिज्य चिह्न
Controller General of Patents, Designs and Trade Marks

*परस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति दी गई है तथा देश का नाम। डिजाइन का स्वतंत्रिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार अधिनियम एवं नियम के निबंधनों के अंतर्गत, यदि कोई भी अधिनियम अर्थात् के लिए किया जा सकता है। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा डिज़ाइन में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

The reciprocity date (if any) which has been allowed and the name of the country. Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years. This Certificate is not for use in legal proceedings or for obtaining registration abroad.

✓ **CIRC Signature**

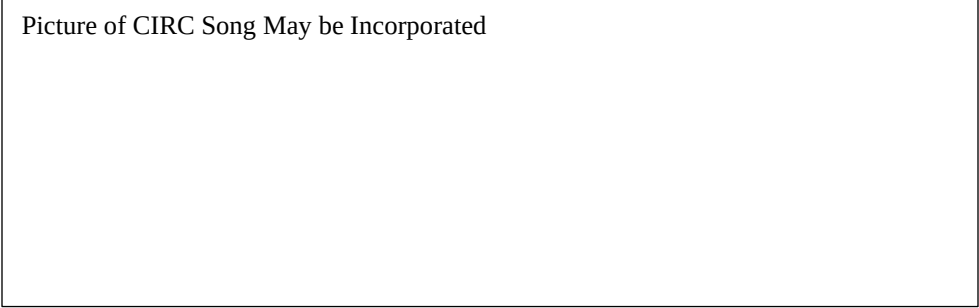
Developed ICAR-CIRC signature and it was inaugurated on 3rd November 2024 on the occasion of institute foundation day.



✓ **CIRC Song**

- Composed and developed ICAR- CIRC Song and it was inaugurate on 3rd November 2024 on the occasion of institute foundation day.

Picture of CIRC Song May be Incorporated



National Workshop on Awareness on IPR and its Management

A national workshop on “Awareness on Intellectual Property Rights and its Magement” sponsored by UP Council of Science and technology was organized on 18/03/2024. A total of 185 participants including scientist, assistant professors, technicals, post graduate students from 8 different universities and ICAR-institutes attended the workshop. The workshop was inaugurated by Dr A.K. Mohanty, Director ICAR-CIRC and Chairman ITMU. In his inaugural speech Dr Mohanty emphasized the importance of IPRs and its protection and also highlighted the different elements which provide opportunities for the protection of technologies for best utilization. He also reiterated about identification and short listing of protectable technologies to be generated by the Institute.

Ms. Chhavi Garg, NIPAM Officer & Examiner of Patents & Designs & Trademark, Indian Patent office, Government of India, New Delhi delivered lecture on “Introduction to Patent System in India”. Mrs. Vidisha Garg, Attorney, Anand and Anand, Partner/Patents, Protection and Contentious (IPO & IPAB), Noida (UP) delivered lecture on “Drafting of the Patent Specification”. Dr Rajneesh K Sharma, Managing Trustee Urmvadnyaas Foundation, New Delhi delivered lecture on “Technology Evaluation and Transfer” and Dr Sumit Mahajan, Incahrge ITMU, CIRC delivered lecture on “Prior Art Searching”. Apart from the lectures a panel discussion was held with the participants to addressing their queries by the experts.

National Workshop on Awareness on IPR and its Management





ITMU Workshop on IPR Issues:

The ITMU Workshop on Intellectual Property Rights (IPR) issues was organized by ICAR-CIRC Meerut on 16.01.2024. It provided a specialized forum to address critical IPR challenges and innovations in cattle research. Bringing together expert, attorney Smt. Vidisha Garg, researchers, and policymakers, this workshop aimed to promote awareness and understanding of IPR in agricultural science, particularly regarding patents, trademarks, and technology transfer. The event emphasizes safeguarding innovations, fostering collaboration, and aligning research with national priorities for sustainable agricultural development. All Institute scientists participated in this interactive session and workshop.



ITMU Workshop on IPR Issues on 16.01.2024

Development of First Synthetic Cattle Breed of India

Development of first synthetic cattle breed of India "Frieswal" which has been Gazette notified vide notification no. 4206 dated 09.12.2024.

रजिस्ट्री सं. सी.एल.- 33004/89	Date: 09.12.2024
REGD. No. D. L.-33004/89	
	
भारत का राजपत्र The Gazette of India	
सी.जी.-डी.एल.-अ.-10122024-259302 CG-DL-E-10122024-259302	
असाधारण EXTRAORDINARY	
भाग II—खण्ड 3—उप-खण्ड (II) PART II—Section 3—Sub-section (II)	
प्राधिकार से प्रकाशित PUBLISHED BY AUTHORITY	
सं. 4906] No. 4906]	नई दिल्ली, सोमवार, दिसम्बर 9, 2024/अग्रहायण 18, 1946 NEW DELHI, MONDAY, DECEMBER 9, 2024/AGRAHAYANA 18, 1946
कृषि एवं किसान कल्याण मंत्रालय (कृषि अनुसंधान और शिक्षा विभाग) अधिसूचना नई दिल्ली, 9 दिसम्बर, 2024	

NOTIFICATION

New Delhi, the 9th December, 2024

S.O. 5302(E).—In exercise of the powers conferred on Department of Agricultural Research and Education, Ministry of Agriculture and Farmers' Welfare, Government of India under PART III, Sl. no. 7 of the Allocation of Business Rules, the Central Government hereby decides that it is necessary and expedient in public interest to recognise the breed of livestock specified in column (3) and their Accession Number in column (5) of species mentioned in column (2) of the Table below; it is hereby notified that the said breed of livestock shall be the notified breed of the States mentioned in column (4) to be kept and reared for purposes of animal husbandry, production, breeding, conservation, utilization, consumption and trade; and shall be the notified breed for the whole of India for the above purposes with effect from the date of publication of this notification in the official Gazette of Government of India, namely:-

TABLE

Serial number	Species	Breed	States	Accession Number
(1)	(2)	(3)	(4)	(5)
1.	Synthetic Cattle	Frieswal	Uttar Pradesh Uttarakhand	INDIA_CATTLESYNTHETIC_2024_FRIESWAL_04001

[F. No.-D-04/9/2024-IC-1]

SANJAY GARG, Addl. Secy. (DARE) & Secy. (ICAR)

Renewal of the ISO9001:2015 certification of the institute: Annual surveillance audit of the ISO9001:2015 certificate of the institute was carried out by ISO consultant M/S quality consultant with his team on 26-27 Dec 2024. ISO consultant had the meeting with all heads and section incharges at 03.30PM on 27th Dec 2024 and discussed about compliance of ISO standards by the institute. The team also visited all the division/sections/laboratories of the institute. The ISO9001:2015 certificate of the institute was renewed.



ISO officials visiting SF laboratory of the institute



Registration Certificate

This is to certify that

ICAR – CENTRAL INSTITUTE FOR RESEARCH ON CATTLE MEERUT

G.F. ROAD, POST BAG NO.17, MEERUT CANTT - 250001, UTTAR PRADESH, INDIA.

has been assessed by RAPL and found to comply with the requirements of

ISO 9001 : 2015 Quality Management Systems

For the following activities:

"RESEARCH AND DEVELOPMENT ON CATTLE FOR HIGHER
PRODUCTIVITY AND PROFITABILITY".

Certificate Number: E2023126363
Date of certification: 26/12/2023
1st Surveillance on or before: 25/12/2024
IInd Surveillance on or before: 25/12/2025
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HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING

The employees of ICAR-CIRC participated in various training programmes, seminars, conferences, workshops, symposia, and meetings conducted by different organizations to enhance their knowledge and upgrade their skills in diverse areas such as science and technology, administration, and financial management. Additionally, the institute itself organized several training programmes, conferences, meetings, and workshops for a wide range of stakeholders.

i) The details of the training programmes attended by institute staff are given below:

S.No	Name of employee	Particular of training	Duration	Venue/Organising Instt
1	Dr. Anjali, Scientist (CPR Division)	AgrIP 2024 - Short Course on Patents in Agriculture	Jan 15 to Feb 15, 2024	IPTM, ICAR New Delhi
2	Dr Devara Divya, Scientist (CGB Division)	AgriP 2024 Online short course on Patents	Jan 15 to Feb 15, 2024	ICAR-CIFT, Kochi, Kerala
3	Dr Sumit Mahajan, Scientist (CPR Division)	SRIJAN: Empowering ZTMC/ITMUs of ICAR institutes	Jan 17-19, 2024	IPTM unit ICAR, New Delhi
4	Dr Sumit Mahajan, Scientist (CPR Division)	Development and translation of new generation vaccines and diagnostics for animal health from lab to land	Jan 24 to Feb 13, 2024	ICAR-IVRI Izatnagar
5	Dr. Anjali, Scientist (CPR Division)	Nature positive farming in view of climate change and food security	Feb 19-23, 2024	ICAR-IIFSR, Modipuram, Meerut
6	Dr Devara Divya, Scientist (CGB Division)	Nature positive farming in view of climate change and food security	Feb 19-23, 2024	ICAR-IIFSR, Modipuram, Meerut
7	Dr Naresh Prasad, Sr Scientist (Vety Extn)	Optimizing Dairy Cattle Production under Changing Climate	Mar 18-20, 2024	ICAR-CIRC Meerut/ MANAGE, Hyderabad
8	Dr Sumit Mahajan, Scientist (CPR Division)	Refresher Training Program for NABL Assessors,	Mar 23, 2024	NABL, New Delhi
9	Sh Rahul Kumar F&AO, CIRC	Capacity building of newly recruited Administrative Officers and Finance & Accounts Officers of ICAR	June 3-28, 2024	at ISTM Delhi, AJNIFM Faridabad
10	Dr (Ms) D Devara, Scientist CGB Division	Online training programme on 'Bioinformatics	Jun 24-28, 2024	ICAR-IASRI New Delhi

		Advances in Genomics Data Analysis’		
11	Sh Rahul Kumar F&AO, CIRC	Training Programme on Pension and other retirement benefits (PRB-01-14)	Aug 05-07, 2024	ISTM, New Delhi
12	Sh Rahul Kumar F&AO, CIRC	MDP training programme on Public Procurement (Basic)	Sep 02-07, 2024	AJNIFM Faridabad
13	Dr (Ms) D Devara, Scientist CGB Division	Training programme on ‘Next Generation Sequencing and Data Analysis (In-person mode)	Oct 21-25, 2024	ICAR-NAARM, Hyderabad.
14	Dr Sushil Kumar HoD, CGB Division	Training programme ‘Vigilance perspectives for ICAR officers’	Nov 06-08, 2024	ICAR-NAARM, Hyderabad.
15	Sh Vikas Kumar, Asstt (Audit section)	Training programme on “Administrative and Financial Management”	Nov 25-29, 2024	ICAR-NAARM, Hyderabad.
16	Sh Abhijeet Kumar, Asstt (Estt section)	Training programme on “Administrative and Financial Management”	Nov 25-29, 2024	ICAR-NAARM, Hyderabad.
17	Sh Rohit Kumar, Asstt (S&P section)	Training programme on “Administrative and Financial Management”	Nov 25-29, 2024	ICAR-NAARM, Hyderabad.

ii) Trainings / Seminars / conference / workshop / organized by the ICAR-CIRC Meerut

S. No.	Name of the seminar / conference / training	Date & Venue	Organizing secretary
1.	3 months professional attachment training for the probationer scientist Dr Yallapa M. Samagond, NRC Mithun	Jan to March 2024	Dr. S.K. Dabas
2.	Lecture cum Demonstration for the participants of 21 days Winter School organised by SVPUA&T	04/03/2024	Dr. S.K. Dabas
3.	Training programme on ‘Optimising dairy cattle production under changing climate’ under the Off-Campus Online Collaborative Training Program with MANAGE, Hyderabad during	Mar 18-24, 2024	Dr. Pramod Singh

4.	National Workshop on “Awareness on Intellectual Property Rights (IPRs) and its Management”	18/03/2024	Dr. Sumit Mahajan
5.	XXXII Annual Conference & International Symposium on “Advances in Physiological Research in Omics Era for Sustainable Animal Production & Livelihood Security under the Changing Climatic Scenario,”	27 th Nov to 29 th Nov 2024	Dr Siddhartha Saha
6.	IDA seminar		
7.	SPVUA&T		

iii) Conference/seminars/symposia attended by Scientists

S. No	Name of employee	Particular of Conference / seminars / symposia/ workshop / meeting	Duration	Venue
1.	Dr. Avishek Biswas & Dr Pramod Singh	20 th Biennial International Conference of Animal Nutrition Society of India on the theme 'Sustainable Animal Nutrition for Global Health and Production: Innovations and Directions Research: Combating the Challenges of Productivity, Health and Welfare of Animals'	23-25 January, 2024	TANUVAS, Chennai
2.	Dr. Suresh Kumar D.S. Dr. Megha Pande	17th Agricultural Science Congress on Frontier Sciences and Technologies in Agriculture for a Developed India, conducted by the	20th to 22nd February 2025	GBPUA&T, Pantnagar
3.	Dr. Anjali	4th Annual Convention of Animal Physiologists Association and National Symposium on "Advanced Physiological Strategies for Sustainable Livestock Production and Reproduction"	1 st – 2 nd March, 2024	ICAR-CSWRI, Avikanagar
4.	Dr. Anjali Dr. Megha Pande	National Symposium on Sustainable Agriculture practices for food security and environmental conservation (conference)	15 th and 16 th march 2024	SVPUAT, Meerut.
5.	Dr. SK Verma	National Conference on Living with Nature: Soil, Water and Society in Ecosystem Conservation	20 – 22 Jun 2024	ICAR-IISWC, Dehradun
6.	Dr. SK Verma	Regional Consultation on Science of Natural Farming	19 Jul 2024	Hotel Centrum, Lucknow
7.	Dr S K Verma and Dr. Ajayvir Singh Sirohi	Rashtriya Hindi Vigyan Sammelan-2024 on “अमृतकाल में राष्ट्रीय वैज्ञानिक चेतना का उन्नयन”	July 30-31, 2024	CSIR-AMPRI, Bhopal
8.	Dr Pramod Singh	'National Symposium on 'Challenges and Prospects for Mitigating Enteric Methane Emissions from Indian Livestock'.	Oct 03, 2024	ICAR-NIANP, Bengaluru
9.	Dr. SK Verma	Workshop on Organisation of 17th Agricultural Congress	14 Oct 2024	GBPUAT, Pantnagar

10	Dr Ajayvir Singh Sirohi	International Conference on “Agritech Intelligence and beyond: Cutting edge innovations in Agriculture and Allied Sciences”	October 15-17, 2024	SKAUST-K, Srinagar
11	Dr. Suresh Kumar D.S., Dr. Naimi Chand, Dr S. Saha, Dr. Sumit Mahajan, Dr. Megha Pande, Dr. Anjali, Dr Ajayvir Singh Sirohi, Dr Rajiv Ranjan Kumar, Dr Sushil Kumar, Dr Divya, Dr Pramod Singh, Dr Avishek Biswas, Dr S.K. Verma and Dr Ravinder Kumar	XXXII Annual Conference & International Symposium on “Advances in Physiological Research in Omics Era for Sustainable Animal Production & Livelihood Security under the Changing Climatic Scenario,”	27 th to 29 th Nov. 2024	ICAR-CIRC, Meerut

iv) Professional Award/ recognitions of ICAR-CIRC Scientists at different forum

S.No.	Name	Recognition/ Award	Name of event and date	Awarding institute/society /org.
1.	M. Pande, S. Kumar, S. Tyagi, A. S. Sirohi, N. Chand, Y. K. Soni, S. Mahajan, S. Saha, A. Sharma, Sarika, N. Prasad, Anjali, A. K. Mohanty	Second-best prize in the poster presentation	Conference Frontier Sciences and Technologies in Agriculture for a Developed India conducted by the 17th Agricultural Science Congress, GBPUAT, Pantnagar and NAAS, New Delhi during 20th to 22nd February, 2024	GBPUAT, Pantnagar
2.	Dr Divya	Second best oral presentation award	By “XVIII Annual convention of ISAGB and National conference ISAGBCON 2024 on New vistas in harnessing genetic resources for sustainable animal production” organized by Bihar Animal Sciences University, Patna and Indian Society of Animal Genetics and Breeding on November 21st-22nd, 2024 at Patna.	ISAGBCON 2024
3.	Pramod Singh, Aanchal Sharma,	Best (2nd) paper presentation award	XX Biennial International Conference on “Sustainable	Animal Nutrition

	Rajendra Prasad, SK Verma and Avishek Biswas	for paper on 'Effect of additives on preparation of silage (in vitro) from green carrot tops'	animal nutrition for global health and production: Innovations and directions" Jan 23-25, 2024 at Madras Veterinary College, TANUVAS, Chennai – 600 007	Society of India and Madras Veterinary College, TANUVAS, Chennai (TN)
4.	Pramod Singh	Chairman of technical/poster session on 'Poultry Nutrition'	XX Biennial International Conference on "Sustainable animal nutrition for global health and production: Innovations and directions" during Jan 23-25, 2024 at Madras Veterinary College, TANUVAS, Chennai – 600 007.	Animal Nutrition Society of India and Madras Veterinary College, TANUVAS, Chennai (TN)
5.	Dr Ajayvir Singh Sirohi and Dr S.K. Verma	Received Third Prize in Oral Presentation of paper Pashu Palan Ke Vaigyanik Tathyon Ke Sampreshan Me Social Media Ka Upyog	Rashtriya Hindi Vigyan Sammelan – 2024 on Amritkal Me Rashtriya Vaigyanik Chetna Ka Unnayan organized by CSIR – AMPRI, Bhopal from 30 – 31 Jul 2024 at CSIR – AMPRI, Bhopal	CSIR – AMPRI, Bhopal
6.	Dr Avishek Biswas	Got awarded International Travel Grant-2024 to attend and presents the research findings in PSA Annual Meeting, USA	PSA Annual Meeting-2024, Louisville, Kentucky, USA.	DBT, Govt. of India
7.	Dr Avishek Biswas	Got awarded International Travel Grant-2024 to attend and present the research finding in	International Poultry Congress-2024, Bursa, Turkey.	DST, Govt. of India
8.	Dr Ajayvir Singh Sirohi	Chairman and Judge in Technical Session	Rastriya Hindi Vigyan Sammelan-2024 on “अमृतकाल में राष्ट्रीय वैज्ञानिक चेतना का	CSIR-AMPRI, Bhopal

			उन्नयन” held at CSIR-AMPRI, Bhopal during 30-31 July, 2024.	
9.	Dr Ajayvir Singh Sirohi	Section Editor	Indian Journal of Animal Sciences, New Delhi	Indian Journal of Animal Sciences
10.	Dr. SK Verma	Guest of Honour	Farm n Food Farmers Award Ceremony held at Lucknow	Guest of Honour
11.	Dr. SK Verma	Examiner for evaluation of ORW	Examiner for evaluation of ORW/ Synopsis of Dr. Priyanka Parte, M.V.Sc. Student of Poultry Science	ICAR – IVRI, Izatnagar
12.	Pramod Singh	Students guided (as Co-supervisor)	Mentored Ms Ananya Das Singha, M.Sc. (Environment Science) Scholar from the School of Environment and Sustainable Development, Central University of Gujarat, Kundhela, and Wildlife Institute of India, Dehradun for the faecal analysis of Fiber and proximate composition and co-supervised her dissertation work on “Nutritional Ecology of Hispid Hare”	School of Environment and Sustainable Development, Central University of Gujarat, Kundhela, and Wildlife Institute of India, Dehradun.
13.	Dr. SK Verma	Member, Selection Committee for the selection of Field Assistant of DST Project	Selection Committee for the selection of Field Assistant of DST Project	Dr. SK Verma
14.	Dr Avishek Biswas	Co-organising Chairman	32 nd Annual Conference of SAPI and International Symposium’ on Nov 27-29, 2024 organized by SAPI and ICAR-Central Institute for Research on Cattle, Meerut Cantt	SAPI and ICAR-CIRC, Meerut
15.	Pramod Singh	Technical secretary and session co-coordinator	32 nd Annual Conference of SAPI and International Symposium’ on Nov 27-29, 2024 organized by SAPI and ICAR-Central Institute for Research on Cattle, Meerut Cantt	SAPI and ICAR-CIRC Meerut
16.	If anyone is left			



Dr Pramod Singh receiving award at the AWARD Ceremony of XX Biennial International Conference, Chennai

v) Invited Lecture/Lead paper presented by ICAR-CIRC Scientists

S No.	Topic of Lecture	Forum where presented/delivered	Date	Presenting Scientist
1.	Prospects of animal feeding technologies on milk quality under changing climate	Online Collaborative Training Program titled “Optimizing Dairy Cattle Production under Changing Climate” with MANAGE	20.03.2024	Dr Pramod Singh
2.	Feeding Management and Animal Nutrition	Seven Days Residential Dairy Training Programme organized by Surya Foundation, New Delhi at Surya Sadhana Sthali, Jhinholi (Haryana)	5.04.2024 to 9.04.2024	Dr S.K. Verma
3.	Animal Physiology and Nutrition	Delivered lecture to students of XVIII M.Sc. (Wildlife Science) course during 2nd Semester theory teaching and practical at the Wildlife Institute of India, Dehradun (UK).	06.05.2024 to 08.05.2024	Dr Pramod Singh
4.	Delivered talk and explained ongoing various activities in Molecular Genetics Lab, Cattle Genetics and Breeding division	Delivered to 16 students of SVP@T, Meerut at ICAR-CIRC, Meerut	06.06.2024	Dr Divya
5.	भारतीय परिप्रेक्ष्य में देशी गोवंश की भूमिका एवं भविष्य की संभावनाएं	Rashtriya Hindi Vigyan Sammelan-2024 held at CSIR-AMPRI, Bhopal	30.07.2024 to 31.07.2024	Dr A.S. Sirohi
6.	Dietary influence on milk fat in dairy cows’	ICAR CIRC, Meerut	02.08.2024	Dr Pramod Singh

7.	Breeding and Management Strategies for Emissions Mitigation in Livestock	Training cum workshop on Farming Agriculture and Climate change Connections and solutions at CSE- Anil Agarwal Environment Training Institute (AAETI), Nimli, Tijara, Rajasthan	21.08.2024 to 23.08.2024	Dr Ravinder Kumar
8.	Experience for indigenous breed improvement programme	Brainstorming session organized by Maharashtra Animal & Fisheries Sciences University, Nagpur on Advanced Research Avenue for Genetic Improvement in ANGR of Maharashtra at Nagpur	29.08.2024	Dr Sushil Kumar
9.	Economics of Indigenous & Crossbred Cattle for milk Production	Delivered to the BVSC & AH final year students	05.09.2024 to 06.09.2024	Dr Ravinder Kumar
10.	Creative initiatives transforming waste in to art and promoting community pride	Delivered lecture on waste to wealth to train safai mitra/sanitation workers” in “Swachhata hii seva abhiyan 2024 programme	September 17th to October 2nd, 2024.	Dr Divya
11.	Record keeping in dairy farmers and their importance and Molecular techniques and their introduction	Delivered to 79 BVSc & AH interns (4 batches with 20 students each) at ICAR-CIRC, Meerut	September 5th, 19th and November 4th and 20th, 2024	Dr Divya
12.	Recent developments towards farm mechanization in dairy cattle production	International Conference on “Agritech Intelligence and beyond: Cutting edge innovations in Agriculture and Allied	15-17 October, 2024	Dr A.S. Sirohi

		Sciences” held at SKAUST-K, Srinagar		
13.	Augmenting milk production in Cattle: Converging Conventional and Advanced Technologies	Lead Paper presented in XVIII Annual Convention of ISAGB and National Conference ISAGBCON 2024 on New Vistas in Harnessing Genetic Resources for Sustainable Animal Production, held and organized at Bihar Animal Sciences University, Patna and Indian Society of Animal Genetics and Breeding	21.11.2024 to 22.11.2024	Dr Sushil Kumar
14.	Balanced Nutrition for Better Livestock Productivity	Vrihad Pashu Aarogya Mela and organized by Department of Animal Husbandry and Veterinary Services, Uttar Pradesh at Village Salahpur, Block Rohra, District Meerut on 23 Nov 2024.	23.11.2024	Dr S.K. Verma
15.	Delivered talk and explained ongoing various activities in Molecular Genetics Lab, Cattle Genetics and Breeding division	Delivered to 100 B.Sc Agriculture final students of Choudhary Shivnath Singh Shandilya college, Machhra, Meerut at ICAR-CIRC, Meerut	December 12th, 2024	Dr Divya
16.	Balanced Feeding of different categories of livestock	Training cum- input distribution programme on ‘Utpadakta badane hetu pashuon ki swasthya prabandhan avam santulit aahar under TSP at Vill-	20.12.2024	Dr Pramod Singh

		Baman Sarai, Kotwali Bock, Distt- Bijnaur (UP).		
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vi) Sponsored programmes organized at ICAR CIRC, Meerut

S.No.	Name of training	Date & Venue
1	A Consultative Meeting for Cattle Farmers In Collaboration with KVK, Papum Pare (DAVH & DD, Nirjuli)	13 Jan 2024 KVK, Papum Pare (DAVH & DD, Nirjuli)
2	Farmers Training inside the State Sponsored by Sub Mission on Agriculture Extension (ATMA), Muzaffarnagar Sponsored by ATMA, Muzaffarnagar	19 Feb 2024 ICAR-CIRC, Meerut
3	Raising Calf to Calf In Collaboration with Indian Dairy Association	20-21 Feb 2024 ICAR-CIRC, Meerut
4	Farmers Training inside the State Sponsored by Sub Mission on Agriculture Extension (ATMA), Muzaffarnagar Sponsored by ATMA, Muzaffarnagar	22-23 Feb 2024 ICAR-CIRC, Meerut
5	IDA Seminar Animal Health and Clean Milk Production Sponsored by Indian Dairy Association	16 Mar 2024 Village Chharra (Aligarh)

Extension Section

During the report period, ICAR-CIRC, Meerut participated in 9 Kisan Melas/exhibitions organized by different State and Central Government Institutions in which research activities and technologies developed by the Institute were showcased. More than 7000 farmers and stakeholders visited the ICAR-CIRC stall during different melas. Various animal health cum infertility camps were organized by the institute to address different animal health related problems faced by farmers.

Participation in Kisan Melas and Exhibitions

S. No.	Name of the exhibition	Organized by	Venue	Duration	No. of Farmers registered
1	National Agricultural Fair-2024	IIVR, Varanasi UP	ICAR-IIVR, Varanasi UP	February 3-5, 2024	105
2	Atmnirbhar Krishi Sah Baagwani Vistaar evam Pashudhan Kalyan Mela	KVK (under RP CAU) Piprakothi, East Champaran, Bihar	KVK Piprakothi, East Champaran, Bihar	February 10-12, 2024	147
3	National Goat Fair & Agro-Industrial	ICAR-CIRG, Makhdoom Mathura	ICAR-CIRG, Makhdoom Mathura	March 6, 2024	30
4	National Potato Fest-2024	ICAR- CPRI, Regional Station, Modipuram, Meerut	ICAR- CPRI, Regional Station, Modipuram, Meerut	March 9-10, 2024	85
6	Indian Dairy Industry & Technology Expo-2024	Organized by NNS Media Group Pvt Ltd	Pragati Maidan New Delhi	July 20-22, 2024	284
7	All India Farmers Fair & Agro- Industrial Exhibition	SAPUA&T Modipuram	SAPUA&T Modipuram	October 16-18, 2024	151
8	Bakri Maha Kumbh	ICAR-CIRG, Makhdoom Mathura	ICAR-CIRG, Makhdoom Mathura	November 18, 2024	33
9	Agril Exhibition during 38 th foundation	ICAR-CIRC, Meerut	ICAR-CIRC, Meerut	November 3, 2024	250



ICAR-CIRC Participated in National Agriculture Fair 2024 at IIVR, Varanasi, Uttar Pradesh. 03-05 February, 2024



ICAR-CIRC Participated in Atmnirbhar Krishi Sah Baagwani Vistaar evam Pashudhan Kalyan Mela at KVK, Piperakothi, East Ghazipur, 10-12 February, 2024



ICAR-CIRC Participated in National Goat Fair and Agro-Industrial Exhibition at ICAR- CIRC, Makhdoom, Mathura, 6th March, 2024.



ICAR-CIRC also participated in National Potato Fest-2024 at ICAR- CPRI, Regional Station, Modipuram, Meerut. 9th -10th

Farmers/Student visits organized at ICAR-CIRC Meerut

S. No.	Visits/Goshthies	Venue and date	Coordinating scientists
1	Visited 16 B.Sc. (Ag. Hons.) Students and 2 faculties members of College of Agriculture, SVPUA&T, Modipuram, Meerut	ICAR-CIRC, Meerut 6 June, 2024	Dr. Naresh Prasad
2	Visited 100 B.Sc. Agriculture final year students and five faculty members of CSSS PG College, Machhra, Meerut	ICAR-CIRC, Meerut 12 December, 2024	Dr. Naresh Prasad Dr. Divya D
3	Farmer scientist interaction, goshties during foundation day 2024	ICAR-CIRC, Meerut 3 November, 2024	Dr Naresh Prasad, Dr Sumit Mahajan
4	Visited 25 student, College of Biotechnology, SVPUA&T, Modipuram, Meerut	ICAR-CIRC, Meerut 23 August, 2024,	Dr Naresh Prasad Dr Anjali

Visits of Students

A total of 16 B.Sc. (Ag. Hons.) students of College of Agriculture, SVPUA&T, Modipuram visited ICAR-Central Institute for Research on Cattle, Meerut on 6 June, 2024. The students were accompanied by 02 faculty members of the college. The students were explained on various activities of the institute laboratory and Farm establishment. Students were also exposed to the preparation of vermicomposting of cow dung. The programmes were co-ordinate by Dr Naresh Prasad, in-charge, Extension Section.



Visit of B.Sc. (Ag. Hons.) students of College of Agriculture, SVPUA&T, Modipuram on 6 June, 2024 at ICAR-CIRC, Meerut

A total of 25 students of College of Biotechnology, SVPUA&T, Modipuram visited ICAR-Central Institute for Research on Cattle, Meerut on 23 August, 2024. The students were accompanied by 02 faculty members of the college. The students were explained on various activities of the institute laboratory and Farm establishment. Students were also exposed to the preparation of vermicomposting of cow dung. The programmes were co-ordinate by Dr Naresh Prasad, in-charge, Extension and Dr. Anjali, Scientist.

Visit of B.Sc. (Agriculture) students of S.S.S. PG College, Machhra, Meerut

A total of 100 B.Sc. Agriculture final year students and five faculty members of CSSS PG College, Machhra, Meerut participated in the ICAR-Central Institute for Research on Cattle on December 12, 2024. An educational tour was conducted in Meerut. In which all the students were shown the institute's molecular genetics lab, bovine physiology and reproduction lab, animal nutrition lab, dairy processing and incubation lab, agrobiodiversity lab, semen freezing lab, quality control lab, dairy farm, vermicomposting unit, A tour was conducted to the Bull Farm and Fodder Unit and the Divisional Heads and Incharges informed about the various research, products and services of the Institute. The programme was organized under the guidance of Dr. A.K. Mohanty, Director, ICAR-Central Institute for Research on Cattle, Meerut. The programme was coordinated by Dr. Naresh Prasad, Incharge, Extension Section and Dr. Divya D., Scientist.



Visit of B.Sc. (Agriculture) students of S.S.S. PG College, Machhra, Meerut on 12 December, 2024 at ICAR-CIRC, Meerut

Days and week Celebrations

Republic Day

In the spirit of patriotism and unity, the ICAR-Central Institute for Research on Cattle (ICAR-CIRC) in Meerut commemorated Republic Day on January 26, 2024, with a fervor that reflected the essence of the nation's diversity and progress. This year's celebration was centered around the theme of “Viksit Bharat” (Developed India) and “Bharat – Loktantra ki Matraka” (India – Mother of Democracy), emphasizing the importance of individuals doing their bit to strengthen India's Republic and democratic values.

Dr. A. K. Mohanty, Director, paid homage to the valiant liberation fighters and unfurled the National Flag. He addressed the gathering with enthusiasm, and applauded the exemplary work carried out by the institute. He briefed about the institute's major achievements, such as land acquisition at Babugarh, the IVF-OPU project grant of approximately 9 crores, the granting of two patents, and the recognition of Frieswal as a synthetic breed, among others. Dr. Mohanty emphasized that every individual's contribution is vital to the institute's progress. As a symbol of collective commitment, all employees pledged to the country's aspirations and its role as the nurturer of democracy.



International Yoga Day

ICAR-Central Institute for Research on Cattle Meerut celebrated 10th International Day of Yoga on 21st June 2024. Dr. Ashok Kumar Mohanty, Director of ICAR-CIRC, Meerut welcomed the gathering and emphasized the importance of practicing yoga for healthy lifestyle. On the occasion, Shri Anil Pandey Ji, yoga expert from Patanjali Yogpeeth, Meerut explained the benefits of different Pranayamas and Asanas. He also demonstrated various pranayamas and asanas and also informed the common precautions to be followed while performing yoga. Staffs of the institute attended the celebration of International Day of Yoga. This programme was coordinated by Dr. A.K. Das, Yoga Day and In-charge Extension Section.



Celebration of World Veterinary Day

ICAR-CIRC Hosts Inspiring World Veterinary Day 2024 Celebration in Meerut

On April 27th, 2024, the ICAR-Central Institute for Research on Cattle (ICAR-CIRC) in Meerut, Uttar Pradesh, buzzed with enthusiasm as it welcomed over a hundred participants, including veterinarians, farmers, students, and animal lovers from across the region to celebrate World Veterinary Day-2024. This year's theme, "Veterinarians are essential health workers," set the tone for a day of reflection, learning, and collaboration aimed at recognizing the critical role veterinarians play in maintaining animal health and safeguarding public health.

Distinguished Chief Guest of the function was Prof (Dr.) M.C. Sharma, Former Director-cum-Vice Chancellor of ICAR-IVRI, Izatnagar. Dr. Sharma's insightful remarks covered a wide array of topics, ranging from disease prevalence and surveillance to innovative technologies such as sex-sorted semen and area-specific mineral mixtures aimed at enhancing animal productivity.

He emphasized the importance of technology development, entrepreneurship, and collaboration between veterinarians and other stakeholders to address emerging challenges in animal health. Dr. Rajiv Singh, Dean, College of Veterinary and Animal Science, SVPUAT, Modipuram, and Dr. R. K. Sharma, Chief Veterinary Officer of Meerut, served as esteemed guests of honour. Dr. Singh highlighted the significance of animal products and the impact of climate change on animal production, while Dr. R. K. Sharma underscored the multifaceted role of veterinarians in saving animals and controlling the spread of zoonotic diseases.

The event drew a diverse crowd of over a hundred participants, including field veterinarian officers, para-vets, internship students from the College of Veterinary Science at SVPUAT, Modipuram, progressive farmers, and members of the scientific and technical staff of ICAR-CIRC, Meerut. Their presence underscored the widespread acknowledgment of the vital contributions made by veterinarians to society. Throughout the day, attendees engaged in lively discussions and interactive sessions, addressing a wide range of topics pertinent to veterinary medicine and animal husbandry. Dr. Manju Chauhan, an avid animal lover, Mrs. Milan Sharma, a progressive dairy farmer, and Sri Vidya Ratan, a passionate dog breeder, shared their experiences and insights. The event also provided a platform for budding veterinarians to be heard. Earlier, Dr. A.K. Mohanty, Director of ICAR-CIRC, delivered a comprehensive overview of the institute's activities and initiatives. He reiterated the theme of World Veterinary Day 2024 and emphasized the invaluable services provided by veterinarians in safeguarding the health and well-being of both animals and humans. Dr. Abhishek Biswas, Head of Cattle Nutrition and Management, extended a heartfelt vote of thanks, while Dr. Megha Pande anchored the event. The World Veterinary Day 2024 celebration at ICAR-CIRC concluded with a resounding affirmation of the indispensable role of veterinarians in shaping a healthier, more sustainable future for animals and humans alike.



Celebration of World Veterinary Day

Celebration of World milk Day 2024

On June 1, 2024, the ICAR-Central Institute for Research on Cattle, Meerut, embraced the spirit of World Milk Day with fervor and gratitude, focusing on the vital role dairy plays in delivering quality nutrition to nourish the world. As part of the celebration, ICAR-CIRC held a one-day training and awareness programme focusing on the "Health Attributes of Milk." This event took place in Atuta village, Hapur, near the upcoming new campus of ICAR-CIRC, Meerut. Atuta village was selected for its demographic profile and substantial dairy animal inventory, making it an ideal location for this educational initiative.

The awareness programme featured lectures from scientists at ICAR-CIRC, each addressing different aspects of dairy health and nutrition. Dr. Rajiv Ranjan Kumar discussed the nutritive value of milk, Dr. Naresh Prasad covered quality assurance of dairy products, Dr. Megha Pande gave a lecture on the role of dairying in daily life, and Dr. Anjali highlighted the health benefits of milk for children and women. This initiative, guided by Dr. A.K. Mohanty, Director of ICAR-CIRC, Meerut, not only celebrated the spirit of International Milk Day but also aimed to empower the community with valuable knowledge, fostering better health practices and enhancing the well-being of Atuta village residents. On this occasion, milk and biscuits were distributed to the women and children in attendance. The program was helped by Shri Virendra ji, Gram Pradhan of Atuta. The program saw participation from over 150 women and children, making it a truly impactful event. The celebration underscored how dairy provides naturally balanced nutrition while promoting a healthier planet.



Celebration of World milk Day 2024 on 01-06-2024

Foundation Day Celebration

ICAR-Central Institute for Research on Cattle, Meerut celebrated its 38th Foundation Day on 3 November 2024. Since its establishment as Animal Project Directorate on 3 November 1987, thirty-seven years ago, this institute is continuously working for bovine breed improvement and increase in productivity. The chief guest of the Foundation Day celebration program was Dr.

Sanjay Kumar, Chairman, Agricultural Scientist Selection Board, New Delhi and special guest was Dr. T.K. Dutta, Director, Central Institute for Research on Buffaloes, Hisar; Dr. A.B. Sahu, Director, National Institute of Animal Nutrition and Physiology, Bangalore Dr. Pramod Kumar Pandey, Director, Directorate of Cold Water Fisheries Research, Bhimtal; Dr. Sunil Kumar, Director, Indian Agricultural Systems Research Institute, Modipuram, Meerut Dr. M. K. Chetli, Director, Central Institute for Research on Goat, Mathura, etc. Dr. A. K. Mohanty, Director, ICAR-Central Institute for Research on Cattle, Meerut welcomed the dignitaries by a shawl and presenting them with a bouquet of flowers.



Celebration of Foundation Day

“Vigilance Awareness Week” launched at Central Cow Research Institute, Meerut

In compliance with the guidelines received from the Indian Council of Agricultural Research, the Central Institute for Research on Cattle, Meerut is organizing “Vigilance Awareness Week” from 28.10.2024 to 03.11.2024 on the theme “Prosperity of the nation with the culture of integrity”. Which was inaugurated today on 28.10.2024 in the institute campus, all the scientists, officers and employees were administered the oath of "Satya Nishtha" by Director Dr. A.K. Mohanty and the Vigilance Officer of the Institute, Dr. Sushil Kumar. Under the Vigilance Awareness Week, farmers in the gram Sabha around Meerut will be made aware of corruption and will be told about its importance.

Establishment Section

Staff positions and updates

Sr.No.	Name of officer /employee	Designation
Scientific Staff		
1.	Dr.Ashok Kumar Mohnaty	Director
Cattle Genetics and Breeding Division		
1.	Dr. Sushil Kumar	HOD, CG&B
2.	Dr. A. K. Das	Principal Scientist
3.	Dr. Ravinder kumar	Principal Scientist
4.	Dr. Naresh Parsad	Sr. Scientist
5.	Dr. Devara Divya	Scientist
Cattle Nutrition and Management Division		
1.	Dr. Avishek Biswas	HOD, CNM
2.	Dr. Pramod Singh	Principal Scientist
3.	Dr. Sanjeev Kumar verma	Principal Scientist
4.	Dr. Ajayvir Singh sirohi	Principal Scientist
5.	Dr. Rajiv Ranjan Kumar	Principal Scientist
Cattle Physilogy and Reproduction Division		
1.	Dr. Suresh Kumar Dhoop Singh	HOD, CP&R
2.	Dr. Naimi Chand	Principal Scientist
3.	Dr. Siddhartha Saha	Principal Scientist
4.	Dr. Sumit Mahajan	Scientist (SS)
5.	Dr. Megha Pande	Scientist (SS)
6.	Dr. Anjali	Scientist
Administration		
1.	Shri Shyam Sunder	Senior Adm. Officer
2.	Shri Rahul Kumar	Finance & Accounts officer (from 22.04.2024)
3.	Mrs. Anita Jain	Private Secretary
4.	Shri N.S. Saini	Astt.Adm. officer
5.	Shri Manoj Nehra	Astt.Adm. officer
6.	Mrs. Pushpa	Personal Secretary
7.	Shri Shanker Kashyap	Personal Assitant
8.	Smt.Nivedita Dubey	Assistant
9.	Shri Vikas Kumar	Assistant
10.	Shri Abhijeet	Assistant (from 23.09.2024)
11.	Shri Rohit Kumar	Assistant (from 03.10.2024)
Technical officers / Technicians		
1.	Shri Sunil Kumar Sharma	Senior Technical Officer
2.	Shri Chhote Singh	Technical Officer
3.	Shri.Mohan Tiwari	T-1

4.	Shri Gyan Chand Yadav	T-1 (from 02.05.2024)
Skilled Supporting Staff		
1.	Shri.Veer Mahendra	Skilled Supporting Staff
2.	Shri. Kailash	Skilled Supporting Staff
3.	Shri.Jitender Giri	Skilled Supporting Staff
4.	Shri. Umesh Kaushik	Skilled Supporting Staff
5.	Shri.Veerpal Singh	Skilled Supporting Staff
6.	Shri Sunil Kumar	Skilled Supporting Staff

NEW JOININGS:

1. Shri.Rahul Kumar joined the institute as Finance & Accounts Officer on 22.04.2024
2. Shri.Abhijeet joined the institute as Assistant on 23.09.2024.
3. Shri.Rohit joined the institute as Assistant on 03.10.2024.
4. Shri. Gyan Chand Yadav Technical (T-1) on 02.05.2024.

PROMOTIONS

1. Smt. Anita Jain, Private Secretary grade pay 5400 on
2. Shri Shankar kashyap, Personal Assistant with MACP grade pay 4600 on
3. Vikas.....

RETIREMENTS

1. Smt. Neerja Joshi LDC upon attaining the age of superannuation, retired from Council's Service and relieved in the afternoon of 31.10.2024.

SANCTION STRENGTH AS ON- 01.01.2024 to 31.12.2024

Sl.No.	Category	Sanctioned	Filled	Vacant
1.	R.M.P.	1	1	0
2.	Scientific	34	16	18
3.	Technical	08	04	04
4.	Administrative	20	12	08
5.	Supporting	09	07	02
	Total	71	41	30

Institutional Committees / In charges/Nodal Officers

1. PME Cell		
1.	Dr. Rajiv Ranjan Kumar, Principal Scientist	Chairman & I/C
2.	Dr. Sushil Kumar, HoD, CG&B Division	Member
3.	Dr. A. S. Sirohi, Principal Scientist	Member
4.	Dr. Naresh Prasad, Senior Scientist	Member
5.	Dr. Sumit Mahajan, Scientist (Sr Scale)	Member Secretary
6.	Dr. (Mrs) Megha Pande, Scientist (Sr Scale)	Member
7.	Mrs. Pushpa, PS will assist in PME activities	
2. Printing and Publication Committee:		
1.	Dr. Rajiv Ranjan, Principal Scientist, In-charge, PME	Chairman
2.	Dr. Pramod Singh, Principal Scientist	Member
3.	Dr. A.S. Sirohi, Principal Scientist	Member
4.	Dr. Naresh Prasad, Senior Scientist	Member
5.	Dr. Sumit Mahajan, Scientist (SS)	Member Secretary
6.	Dr (Mrs) Megha Pande, Scientist(SS)	Member
7.	Dr. (Mrs) Divya, Scientist	Member
8.	Dr. (Ms) Anjali, Scientist	Member
3. HRD Cell		
1	Dr. Pramod Singh, Principal Scientist	Chairman
2	Dr. Naimi Chand, Principal Scientist	Member
3	Dr. (Mrs) Divya, Scientist	Member
4	Dr. Anjali, Scientist	Member Secretary
4. Works Committee:		
1	Dr. Avishek Biswas, HOD, CN&M Division	Chairman
2	Dr. A.V.S. Sirohi, Principal Scientist	Member
3	Administrative Officer	Member
4	FAO	Member
5	Shri Sunil Sharma	Member
6	Shri Gyan Chandra Yadav (T-1, Civil Engineer)	Member
7	I/c Estate Section	Member Secretary
5. Works Committee for ICAR-CIRC Babugarh Campus (for supervision)		
1	Dr. Avishek Biswas, HOD, CN&M Div.	Chairman
2	Dr. A K Das, Principal Scientist	Member
3.	Dr. Ajayvir Singh Sirohi, Principal Scientist	Member
4.	Administrative Officer	Member
5.	Shri Sunil Sharma, STO	Member
6.	Shri N S Saini, AAO	Member Secretary
7.	Shri Gyan Chandra Yadav (T-1, Civil Engineer)	Member
6. Local Purchase Committee:		
1.	Dr. A.K. Das, Principal Scientist	Chairman
2.	Dr. Naimi Chand, Principal Scientist	Member
3.	Indenting Officer	Member

4.	FAO	Member
5.	Incharge Purchase	Member Secretary
7. Tender Opening & Financial Evaluation Committee		
1	Dr. A.K. Das, Principal Scientist	Chairman
2.	Dr.Naimi Chand, Principal Scientist	Member
3	Dr. S. Saha, Principal Scientist	Member
4	FAO	Member
5	Incharge Purchase	Member Secretary
8. Technical (Bid) Evaluation Committee:		
1	Dr. Pramod Singh, Principal Scientist	Chairman
2	Dr.Naimi Chand, Principal Scientist	Member
3	Dr. Megha Pande, Scientist (SS)	Member
4	Indenting Officer	Member Secretary
9. Library Advisory Committee:		
1	Director, ICAR-CIRC	Chairman
2	Dr. S.K. Dhoop Singh, HoD, CP&R Div	Member
3	Dr. Sushil Kumar, HoD, CP&R Div.	Member
4	Dr. Avishek Biswas, HoD, CN&M Div.	Member
5	Dr. Pramod Singh, Principal Scientist I/c, Library	Member
6	Administrative Officer	Member
7	FAO	Member
8	Shri Sunil Sharma,STO	Member Secretary
10. Rajbhasha Committee:		
1	Director, ICAR-CIRC	Chairman
2.	Dr. Pramod Singh, Principal Scientist	Member
3	Dr. S. Saha, Principal Scientist	Member
4	Dr. A. S. Sirohi, Principal Scientist	Member
5	Dr. (Mrs) Divya, Scientist	Member
6	Shri N S Saini, AAO	Member
7	Shri Shankar Kashyap, PA	Member Secretary
11. Internal Committee : (for prevention of sexual Harassment of women employees)		
1	Dr. Megha Pande, Scientist (SS)	Chairman
2.	Dr. Shweta Anand Asstt. Prof. SVPUAT	Member
3	Mrs. Ritu Diwan, Principal, Dayawati Modi Academy, Modipuram	Member
4	Mrs. Anita Jain, Private Secretary	Member
5	Mrs. Nivedita Dubey, Assistant	Member Secretary
12. Staff Welfare Committee:		
1	Dr. Ravinder Kumar, Principal Scientist	Chairman
2.	Dr (Mrs) Divya Devara, Scientist	Member
3	Administrative Officer	Member
4	Shri Sunil Sharma, STO	Member
5	FAO	Member
6.	Smt. Nivedita Dubey(Staff Side), IJSC	Member

7.	Shri Dungar Singh, Skilled Supp. Staff	Member
8	Shri N S Saini, Asstt. Administrative Officer	Member Secretary
13. Price Fixation Committee:		
1	Dr. S.K. Dhoop Singh, HoD, CP&R Division	Chairman
2	Dr. Avishek Biswas, HoD, CN&M Division	Member
3	FAO	Member
4	Administrative officer	Member
5	Shri Vikas Kumar, Assistant	Member Secretary
14. Press and Media Committee:		
1	Dr. Sanjeev Kumar Verma, Principal Scientist	Chairman
2.	Dr. Naresh Prasad, Senior Scientist	Member
3	Dr. Megha Pande, Scientist (SS)	Member Secretary
15. Store Verification Committee (above Rs. 2, 50,000/-)		
1	Dr. Naimi Chand, Principal Scientist	Chairman
2.	Dr. Rajiv Ranjan Kumar, Principal Scientist	Member
3	Indenter	Member
4	In-charge, Store & Purchase	Member Secretary
16. House Allotment Committee		
1	Dr. A K Das, Principal Scientist	Chairman
2.	Dr. Megha Pande, Scientist (SS)	Member
3	Administrative Officer	Member
4	I/C Estate	Member Secretary
17. Corpus Fund utilization Committee		
1	Dr. A K Mohanty, Director, ICAR-CIRC, Meerut	Chairman
2.	Dr. S.K. Dhoop Singh, HoD, CP&R Division	Member
3	Dr. Sushil Kumar, HoD, CG&B Division	Member
4	Dr. Avishek Biswas, HoD, CN&M Division	Member
5	FAO	Member
6	Administrative Officer	Member
7	Sh. Vikas Kumar, Assistant	Member Secretary
18. I/C of different Sections/ Unit/ Facility:		
1	Library	Dr. Pramod Singh, Principal Scientist
2.	ARIS Cell	Dr. Sumit Mahajan, Scientist (SS)
3	Estate Section	Shri N.S. Saini, AAO
4	Security	Shri Manoj Nehra, AAO
5	Vehicle Section	Administrative Officer

6	Guest House	Shri Manoj Nehra
7.	I/c Sales (all types of sales)	Dr S Saha, Principal Scientist
8.	Committee Room	I/c Estate
9.	Conference Room	I/c Estate
10.	Extension Section	Dr Naresh Prasad, Sr. Scientist
19. Nodal Officers:		
1	Dr Sushil Kumar, HoD, CG&B Division	Vigilance Officer
2.	Dr. Pramod Singh, Principal Scientist	HRD (Training)
3	Dr. S K Verma, Principal Scientist	Standing advisory to the farmers
4	Dr Naresh Prasad, Senior Scientist	Swachha Bharat Abhiyan
5	Dr Sushil Kumar, HoD, CG&B Division	CPGRAMS (Scientist & Technical)
6	Shri Vikas Kumar, Assistant	CPGRAMS (Administration & Supporting Staffs)
7.	Dr. Rajiv Ranjan Kumar, Principal Scientist	Right to Information Act-2005
8.	Dr Sumit Mahajan, Scientist (SS)	ERP, E-office, Monthly cabinet report
9	Shri Shyam Sunder, AO	eHRMS, PERMISNET, PMIS database,
10.	Shri Suresh Chand, STO	AADHAR Based Biometric System
11	Shri N S Saini, AAO	CPIO-RTI, Coordinator IMC
20. Auctioning Committee:		
1	Dr. S K Dhoop Singh, HoD, CP&R Div.	Chairman
2.	Dr. AVS Sirohi, Principal Scientist	Member
3	Dr. Ravinder Kumar, Principal Scientist	Member
4	Administrative Officer	Member
5	FAO	Member
6	Shri Chottey Singh	Member
7	Shri Vikas Kumar, Assistant	Member Secretary
21. Senior Official Committee (SOC)		
1	Dr. A K Mohanty, Director, ICAR-CIRC, Meerut	Chairman ITMC

2.	Dr. S.K. Dhoop Singh, HoD, CP&R Division	Member	
3	Dr. Sushil Kumar, HoD, CG&B Division	Member	
4	Dr. Avishek Biswas, HoD, CN&M Division	Member	
5	I/C's of various section	Member	
6	Administrative Officer	Member	
7	FAO	Member	
8	Mrs Pushpa, PS	Member Secretary	
22. Institute Proprietary Committee (IPC)			
1	Dr. Avishek Biswas, HoD, CN&M Division	Chairman	
2.	Dr. S Saha, Principal Scientist	Member	
3	Dr. (Mrs) Divya, Scientist	Member	
4	FAO	Member	
5	Shri Manoj Nehra, AAO & I/C Purchase	Member Secretary	
6	Indentor	Member	
23. Institute Deputation Committee (IDC)			
1	Dr. Sushil Kumar, HoD, CGB Division	Chairman	
2.	Dr. Rajiv Ranjan Kumar, Principal Scientist	Member	
3	Dr. Naimi Chand, Principal Scientist	Member	
4	Administrative Officer	Member Secretary	
24. Institute Grievance Cell			
1	Dr.Suresh Kumar Dhoop Singh, HoD, CP&R Division	Chairman	
2.	Dr. (Mrs) Divya, Scientist	Member	
3	Shri Chottey Singh, T-5	Member	
4	Shri Veerpal Singh, Supporting Staff	Member	
5.	Administrative Officer	Member Secretary	
25. Institute Outreach Programme:			
	Chief Coordinator: Dr. A K Mohanty, Director, ICAR-CIRC		
Sl. No.	Name	Coordinator	Nodal Officer/ PI
1	SCSP	Dr Avishek Biswas, HoD, CN&M, Div.	Dr. S K Verma, Principal Scientist
2.	TSP	Dr Sushil Kumar, HoD, CG&B, Div.	Dr. Naresh Prasad, Senior Scientist
3	NEH	Dr. S K Dhoop Singh, HoD, CP&R, Div.	Dr.Naimi Chand, Principal Scientist
26. ARIS Cell			
1	Dr Sumit Mahajan, Scientist (SS)		In-charge/ Chairman
2	Dr Naresh Prasad, Senior Scientist		Member
3	Dr (Ms) Anjali, Scientist		Member

27. Experimental Dairy Unit		
1	Dr S K Dhoop Singh, HoD, CP&R Division	Coordinator
2	Dr Naimi Chand, Principal Scientist	In-charge/ Chairman
3	Dr (Mrs) Megha Pande, Scientist (SS)	Member
4	Dr (Ms) Anjali, Scientist	Member
28. Farm Section		
1	Dr S K Verma, Principal Scientist	In-charge/ Chairman
2	Dr A V S Sirohi, Principal Scientist	Member
3	Dr, Anjali Scientist	Member
4	Shri Sunil Sharma, STO	Member
29. Institute Proprietary Committee (PAC)		
1.	Dr. Avishek Biswas HOD CNM	Chairman
2.	Dr. Siddhartha Saha, Principal Scientist	Member
3.	Dr. Ajayvir Singh Sirohi, Principal Scientist	Member
4.	Indentor	Member Secretary

Rajbasha

RTI

स्वच्छता ही सेवा अभियान 2024

स्वच्छता ही सेवा अभियान का आयोजन आईसीएआरकेन्द्रीय गौ अनुसंधान संस्थान-, मेरठ में 17 सितंबर से 02 अक्टूबर, 2024 तक किया गया। स्वच्छता ही सेवा अभियान-2024 की थीम थी "स्वभाव स्वच्छता "संस्कार स्वच्छता -। स्वच्छ भारत अभियान के नोडल अधिकारी डॉ नरेश . प्रसाद ने विभिन्न गतिविधियों के समन्वयकों के साथ सक्रिय रूप से समन्वय किया। निदेशक डॉअशोक कुमार मोहंती . के निर्देशन में स्वच्छता ही सेवा अभियान के अंतर्गत निम्नलिखित गतिविधियाँ आयोजित की गईं:

क्रम संख्या	दिनांक	गतिविधियाँ	स्थान
1	17-09-2024	स्वच्छता शपथ एवं स्वच्छता ही सेवा अभियान 2024 प्रतिक चिन्ह वाले टी-शर्ट पहनकर स्वच्छता रन कार्यक्रम का आयोजन किया गया	संस्थान के मुख्य द्वार एवं फाजलपुर से कासमपुर के बीच स्वच्छता रन
2	18-09-2024	स्कूल में पेंटिंग एवं पोस्टर प्रतियोगिता का आयोजन किया गया	डीएवी हाइयर सेकेण्ड्री स्कूल, सदर, मेरठ
3	19-09-2024	जागरूकता एवं सामुदायिक भागीदारी को बढ़ावा देने हेतु स्वच्छता संवाद प्रतियोगिता का आयोजन किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
4	20-09-2024	कलिना गाँव में किसानों को स्वच्छता शपथ दिलाया और अपशिष्ट से उत्पाद बनाने की कला एवं सामुदायिक जागरूकता को बढ़ावा देने का कार्यक्रम किया गया	कलिना गाँव, रोहटा ब्लॉक, मेरठ
5	21-09-2024	स्वच्छता के प्रति प्रतिबद्धता प्रदर्शित करने और जागरूकता बढ़ाने के लिए मानव श्रृंखला बनाई गयी	हनुमान चौक, सदर, मेरठ
6	22-09-2024	संस्थान कार्यालय एवं आवासीय परिसर में सफाई अभियान का आयोजन किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
7	23-09-2024	“पर्यटन स्थल, धार्मिक एवं आध्यात्मिक स्थान” पर सफाई अभियान चलाया गया	पाण्डेश्वर मंदिर, हस्तिनापुर, मेरठ
8	24-09-2024	“ब्लैक स्पॉट की पहचान, साफ-सफाई एवं मैपिंग” का कार्यक्रम किया गया	बैंक रोड, फाजलपुर, मेरठ
9	25-09-2024	स्वच्छ भारत मिशन सांस्कृतिक उत्सव के तहत सर्वश्रेष्ठ नवाचार, स्वच्छता और स्थानीय कला का कार्यक्रम किया गया। पेंटिंग के साथ सफाई के बारे में बताया गया	पाइन आर्मी स्कूल के पास, मेरठ छावनी
10	26-09-2024	सफाई कार्यकर्ताओं और उनके परिवारों के लाभ के लिए निवारक स्वास्थ्य जांच अभियान का आयोजन किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
11	27-09-2024	सफाई मित्रों/ कर्मियों एवं उनके परिवारों के जीवन की बेहतर गुणवत्ता सुनिश्चित करने के लिए स्वास्थ्य सुविधाओं और सेवाओं तक पहुंच के लिए अभियान चलाया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
12	28-09-2024	सफाई कार्यकर्ताओं को टोपी एवं मास्क का वितरण किया गया एवं सफाई कर्मियों द्वारा साइकिल रैली एवं सफाई अभियान का आयोजन किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
13	29-09-2024	सफाई कर्मचारियों को विभिन्न सामाजिक योजनाओं एवं उसके लाभ के बारे में बताया गया साथ ही सफाई अभियान का आयोजन भी किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ

14	30-09-2024	पशुपालन फार्म मंदिर में स्वच्छता अभियान चलाया गया एवं बाद में कृषि विज्ञान केंद्र, बाबूगढ़ में किसानों, प्रैस मीडिया सहित सभी हितधारकों को शामिल करके स्वच्छता ही सेवा की गतिविधियों को अधिक से अधिक लोगों तक पहुँचाने के लिए किसान गोष्ठी का आयोजन किया गया	राज्य पशुपालन फार्म मंदिर एवं कृषि विज्ञान केंद्र, बाबूगढ़, हापुड़
15	01-10-2024	अपशिष्ट से धन कार्यशाला का आयोजन किया गया। जिसमें अपशिष्ट 'कम करें, पुनः उपयोग करें, पुनर्चक्रण' के सिद्धांतों को बढ़ावा देने के लिए अपसाइकल सामग्री से बने उत्पाद बनाने के लिए सफ़ाई मित्रों/स्वच्छता कर्मचारियों को प्रशिक्षित किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ
16	02-10-2024	'स्वच्छ भारत दिवस' मनाया गया। स्वच्छता ही सेवा अभियान के अंतर्गत सभी सफ़ाई एवं संविदा कर्मचारियों के कल्याण एवं लाभ के लिए उपयोगी सामान का वितरण किया गया	भाकृअनुप-कें.गो.अनु.सं. परिसर मेरठ













VISITORS WALL AND ICAR-CIRC IN NEWS

Visit of dignitaries to the Institute

Visit of Hon'ble Shri Shyam Bihari Gupta, Chairman of Uttar Pradesh Gauseva Commission to Central Cow Research Institute, Meerut Cantonment

Chairman, Uttar Pradesh Gauseva Commission Lucknow, Hon'ble Shri Shyam Bihari Gupta visited ICAR-Central Institute for Research on Cattle, Meerut Cantonment on 22 November, 2024. Dr. Suresh Kumar, Director-in-Charge of the Institute welcomed the Honourable Chairman and gave detailed information about the research work and achievements of the Institute. Honorable Shri Shyam Bihari Gupta asked the scientists of the institute to do research on how the price of cow milk will be higher than buffalo milk. He explained in detail the importance of cow urine and cow dung. For example, consumption of cow urine cures cancer and many diseases. Emphasis was laid on making and using Jeevamrit for plants and trees. Highlighted the work being done by the Uttar Pradesh government for the protection of cows and management of stray cows. He also informed that MoU will be done soon with Central Cow Research Institute and help will be taken from the institute for the development of cows. Later, he visited the institute's dairy unit, bull unit, frozen semen unit and animal nutrition laboratory. Mr. Ramesh Pandya, who is associated with cow service, Mr. Ashish Singhal, a progressive farmer from Ghaziabad, were present in this program. Along with this, all the scientists, officers and employees of the institute also participated. This program was organized by Dr. Sajeev Kumar Verma, Principal Scientist and Dr. Naresh Prasad, Senior Scientist



Visit of Hon'ble Shri Shyam Bihari Gupta, Chairman of Uttar Pradesh Gauseva Commission to Central Cow Research Institute, Meerut Cantonment

Assistant Director General (Coordination), Indian Council of Agricultural Research, Dr. Anil Kumar visited

ICAR-Central Botanical Research Institute, Meerut on 6th November, 2024 to view the ongoing Swachhata Action Plan activities. Dr. A.K. Mohanty, Director of the Institute welcomed the Assistant Director General and explained the achievements of the Institute. Dr. Kumar, Assistant Director General (Coordination) chaired the meeting and appreciated the achievements of the Institute. They discussed about achieving wealth from waste. Dr. Naresh Prasad presented the activities so far on microbial based agricultural waste management using vermicomposting under the Swachhata Action Plan of the Institute. All the scientists of the Institute participated in the meeting. After completion of the meeting he visited Molecular Laboratory, Culture & Biochemistry Laboratory, Dairy Processing & Incubation Laboratory, Bovine Physiology & Reproduction Laboratory, Bovine Nutrition & Management Laboratory, Veterinary Laboratory, Frozen Semen Laboratory, Fodder Unit, Bull Rearing Units And visited Vermicomposting unit (under Swachhata Action Plan). Later visited Dairy Unit of ICAR-CIRC.



Assistant Director General (Coordination), Indian Council of Agricultural Research, Dr. Anil Kumar visited ICAR-Central Botanical Research Institute, Meerut on 6th November, 2024

Brazilian Delegation Visits to ICAR-Central Institute for Research on Cattle, Meerut

In an important step towards boosting collaboration in cattle research, a Brazilian delegation visited the ICAR-Central Institute for Research on Cattle in Meerut. The visit aimed to exchange scientific advancements in cattle research and development with the goal of benefiting the livestock industries of both India and Brazil.

At the outset, Dr. A.K. Mohanty, Director, ICAR-CIRC, gave a detailed presentation on the institute's activities, highlighting past achievements, current projects and future goals in cattle research. Following the presentation, Mr Natalino Avance de Souza, Secretary of Agriculture for the State of Paraná, Brazil, spoke about the Brazilian system for cattle husbandry and shared the key purposes of the delegation's visit. Mr Richard Golba, President of the Institute of Rural Development (IDR) of Paraná, discussed strengthening rural development networks in Brazil. Ms Sandra Moya, the chief of state office presented the overall economy of state of Parana and contribution of Agriculture and talked about Brazil's model for social, economic, and environmental development through science, technology and innovation. Ms Nascimento representing the Araucaria foundation urged the scientists to join the global network and also requested to submit proposal on that portal. Mr Jorge Edison Ribeiro, Senior Manager at Araucaria Foundation worked as interpreter. The areas that were identified for research collaboration were

namely genomic selection, metagenomics, assisted reproductive technology, precision dairy farming and climate resilient cattle production.

The Brazilian delegation visited ICAR-CIRC's laboratories, Male Germplasm Unit and Experimental Dairy Farm and discussed various research and practical aspects of cattle development. The visit ended with a productive discussion between the ICAR-CIRC team of scientists and the Brazilian delegates to identify potential areas of research collaboration. Dr. Rajiv R Kumar, PS coordinated the visit along with Dr. Sushil Kumar, Head, CGB, Dr. Suresh Kumar DS, Head, CPR, and Dr. Avishek Biswas, Head, CNM, sharing their views on collaborative opportunities. The day concluded with a visit to a progressive dairy farm in Modinagar followed by a formal send-off for the delegation.



Brazilian Delegation Visits to ICAR-Central Institute for Research on Cattle, Meerut
(18th October 2024)

Visits of Dr Raghavendra Bhatta, Deputy director General (Animal Sciences), ICAR, New Delhi during brainstorming conducted at CIRC on First Synthetic Milch Breed of Cattle "Frieswal"

Visits of Dr Raghavendra Bhatta, Deputy director General (Animal Sciences), ICAR, New Delhi along with Dr AK Mishra, Former Chairman, ASRB, New Delhi; Dr Nitin V. Patil; Honourable Vice Chancellor, MSFSU, Nagpur, Dr GK Gaur, Asstt. Director General (AP&B), ICAR, New Delhi; Dr. BP Mishra, Director, ICAR - NBAGR, Karnal; Dr BR Gulati, Director, ICAR - NIVEDI, Bangalore; Dr VK Saxena, Director (Research), BASU, Patna; Dr Nitin Kurkure, Director (Research), MSFSU, Nagpur; Dr RK Pundir, Principal Scientist & Head (AGR), ICAR-NBAGR, Karnal; Dr TV Raja, Principal Scientist, ICSR-NDRI, Karnal; Dr Arjava Sharma, Former Director, ICAR-NBAGR, Karnal; Dr Birham Prakash, Former Director, ICAR - CIRC, Meerut; Dr Rajendra Prasad, Former Director, ICAR-CIRC, Meerut; Dr. Shrikant Tyagi, Former Director, ICAR-CIRC, Meerut during brainstorming conducted at CIRC on First Synthetic Milch Breed of Cattle "Frieswal" on 21 October 2024



Visits of Dr Raghavendra Bhatta, Deputy director General (Animal Sciences), ICAR, New Delhi

Visits of Dr. Sanjay Kumar, Chairman, Agricultural Scientist Selection Board, New Delhi during celebration of 38th Foundation Day of ICAR-Central Institute for Research on Cattle, Meerut on 3 November 2024.

Visits of Dr. Sanjay Kumar, Chairman, Agricultural Scientist Selection Board, New Delhi along with Dr. T.K. Dutta, Director, Central Institute for Research on Buffaloes, Hisar; Dr. A.B. Sahu, Director, National Institute of Animal Nutrition and Physiology, Bangalore Dr. Pramod Kumar Pandey, Director, Directorate of Cold Water Fisheries Research, Bhimtal; Dr. Sunil Kumar, Director, Indian Agricultural Systems Research Institute, Modipuram, Meerut Dr. M. K. Chetli, Director, Central Institute for Research on Goat, Mathura during celebration of 38th Foundation Day of ICAR-Central Institute for Research on Cattle, Meerut on 3 November 2024



Visits of Dr. Sanjay Kumar, Chairman, Agricultural Scientist Selection Board, New Delhi

Visits of Dr. M.S. Chauhan, Vice Chancellor, GBPUAT, Pantnagar during 32nd annual SAPI Conference and International Symposium Inaugurated at ICAR-CIRC, Meerut

Visits of Dr. M.S. Chauhan, Vice Chancellor, GBPUAT, Pantnagar along with Dr. G.K. Gaur, ADG (ICAR), and Dr. Mihir Sarkar, Director, NRC Yak during 32nd Annual SAPI Conference and International Symposium Inaugurated at ICAR-CIRC, Meerut on November 29, 2024



Visits of Dr. M.S. Chauhan, Vice Chancellor, GBPUAT, Pantnagar along with Dr. G.K. Gaur, ADG (ICAR), and Dr. Mihir Sarkar, Director, NRC Yak

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