



# EPC Newsletter

Equine Production Campus, Bikaner

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### From the Director's Desk

It gives me immense pleasure in presenting the second issue of the Newsletter of ICAR-NRCE, Equine Production Campus, Bikaner. ICAR-NRCE is relentlessly making untiring efforts to address the major issues of equine health and production. The Centre managed to sustain the priorities all the time with due and diligent focus on delivering solutions to major problems confronting equine production. As a result of these initiatives, the Centre could make steady progress in the prioritised and mandated areas during the period.



The research activities continue to bridge the gap between basic biology and clinical applications thereby providing cutting edge to translational research for improving the health and production of the equine population in the country. Over the years, the population of some of the indigenous breeds of equine has dwindled to the threatening level. The Centre took multipronged approach for their conservation and utilization in agricultural operations and other activities. With an aim of improvement in germplasm of equines, artificial insemination using cryopreserved semen has been popularised among the equine owners in different regions of the country. The technologies of semen cryopreservation and artificial insemination have provided a metal road in achieving the objectives of conservation and propagation of our ancient heritage, the horses of Indian origin. Investigations in addressing the reproductive failure and reproductive disorders are at pace and confident to provide better solutions. The scientists of the Centre are making valid efforts to know the area-specific mineral requirement of the equines to bring out the package-of-practices for different physiological stages of the equines. The scientists at the Centre are also focusing on the causes of the disorders like colic and lameness in equines.

Central to every aspect of research and development has been our dedicated approach in the service of equine fraternity. Equine Husbandry not only provides livelihood to the underprivileged, but also leads to wider economic empowerment and prosperity of equine stakeholders. Several new opportunities are emerging in utility of equines in different sectors, like ecotourism and sports. Equine owners need to make the most of these opportunities for reaping benefits.

In our endeavour to serve the society in a better manner, the Centre welcomes critical suggestions and innovative ideas from the readers and stakeholders for the improvement of the equine production system in the country. I congratulate the scientists and staff of the Equine Production Campus for bringing out the second successive Newsletter of the Campus.

*Bntripathi*  
**B N Tripathi**

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### Sectoral News

#### Test Tube Foal from Vitrified Immature Oocyte

A test-tube foal born in Belgium was conceived using a breakthrough technique in the field of assisted reproduction in the horse. The foal has been called VICSI, a name that combines the two reproductive techniques i.e. vitrification and ICSI (Intra-cytoplasmic sperm injection) used by specialists at the Faculty of Veterinary Medicine at Ghent University, Belgium to conceive the foal.



Live foal produced through VICSI

Vitrification is a cryopreservation method during which oocytes are cooled rapidly resulting in the formation of a glass-like structure. This avoids the formation of ice crystals which can damage the oocyte. For ICSI, delicate manipulation is used to inject a sperm cell into an oocyte. Oocytes are much more sensitive to low temperatures than embryos. Their successful vitrification amounts to an important breakthrough in assisted reproduction in the species.

VICSI, born on May 12, 2017, is living and breathing optimally. The oocytes for the research were removed from equine ovaries collected from a slaughterhouse. These immature ova were vitrified and stored in liquid nitrogen for a week. The oocytes were then matured in an incubator after rapid warming. The mature oocytes were then fertilized by ICSI and cultured in the incubator for nine days. The resulting embryo was transferred to the uterus of a recipient mare on June 20 last year at the Animal Embryo Centre Diergaarderhof, in the Netherlands. Nine days later, through an ultrasound examination it was confirmed that the mare was pregnant.

### Campus News

#### Visit of Dignitaries

#### Visit of Deputy Director General (Animal Science), ICAR, New Delhi

Deputy Director General (Animal Science), ICAR, Dr. H. Rahman visited Equine Production Campus, Bikaner on 16<sup>th</sup> Jan 2016. Dr. B. N. Tripathi, Director, ICAR-NRCE welcomed the DDG (AS). Dr. N. V. Patil, Director, ICAR-NRC on Camel and Prof. A. K. Gahlot, Vice Chancellor of RAJUVAS, Bikaner also graced the occasion.



DDG (AS) addressing the scientists of NRCE and NRCC

DDG (AS) inaugurated the Quarantine Animal Shed, Sick Animal Shed and the Rest House Facility for staff only at the Campus. Dr. B. N. Tripathi appraised about the ongoing activities and achievements of the Centre and Dr. R. A. Legha, In-charge of the Campus, briefed about the operations and activities of the farm.



DDG (AS), ICAR, Dr. H. Rahman interacting with the scientists at Animal Reproduction Laboratory, EPC, Bikaner

DDG (AS) in his address appreciated the various scientific activities going on at the campus and urged the scientists and staff of NRCE and NRCC to work for the benefit of the farming community and to focus on the technology generation. He also applauded the scientists for taking valid initiations in the direction of conservation and propagation of precious indigenous equine germplasm.



Hon'ble DDG (AS) inaugurating the Quarantine Animal Shed at EPC, Bikaner





Hon'ble DDG (AS) unveiling the Sick Animal Shed facility

### Research News

#### Amides as Alternative Cryoprotective Agents in Stallion Semen Freezing

Glycerol is well known and an ideal cryoprotectant for cryopreservation of the semen across the species. Glycerol owing to high viscosity and molecular weight does not readily penetrate and cross the sperm membrane and has also been proved as one of the causes for hampering the fertility. As an alternative to Glycerol, Di-methyl formamide (DMF), an amide having low molecular weight and less viscous than Glycerol, was recently used for the cryopreservation of the indigenous stallion spermatozoa. DMF at 5% concentration gave superior results in terms of increased post-thaw motility and better protection to the plasma and acrosome integrity of the stallion spermatozoa. Currently, trials are in progress to study the fertility of the semen cryopreserved with DMF.

#### Germplasm Generation and Distribution

The Equine Production Campus, NRCE is taking appropriate measures to conserve the elite equine germplasm. The semen of superior stallions was also distributed freely to the field veterinarians for the perpetuation of the species.

<b>Semen Doses* distributed</b>	<b>97</b>
Marwari	67
Poitou	20
Manipuri	10
<b>Semen doses cryopreserved</b>	<b>80</b>
<b>AI done during 2016</b>	<b>12</b>
<b>Animals conceived (AI-2016)</b>	<b>8</b>
<b>Foals born in the year 2016</b>	<b>20</b>
Marwari	6
Manipuri	2
Zanskari	4
Poitou	5
Indigenous	1
Mules	2

\* One dose consists of 8 straws containing 0.5 ml semen each

The Equine Production Campus, NRCE is taking appropriate measures to conserve the elite equine germplasm. The semen of superior stallions was also distributed freely to the field veterinarians for the perpetuation of the species.

#### Work Capacity of Indigenous Equines

Physiological and biochemical indices of stress under draught are very important to be studied in order to derive the critical upper limits of load, speed, time and distance of work in equines. The preliminary studies were conducted with 50 Newton (N) and 100 N draught loads in the donkeys and mules in order to study their performance and stress levels. During the draught work with 100 N, the speed of work was lower, and therefore the animal exhibited lower dispersion of stress parameters as compared to 50 N load. The lower load resulted in better speed and therefore higher fatigue.

#### Designing of an Animal Lifting Device

A large animal lifting device has been developed by the EPC which can be used to lift recumbent animals for treatment and rescue operations in difficult situations. The animal lifting device and slings have been designed and fabricated in collaboration with the Central Institute of Agricultural Engineering, Bhopal. The device, capable of lifting as high as 2000 kg, was developed based on body dimension, weight of different animals and safe areas on animal body for using slings/lifting devices. The device and slings were successfully tested for lifting a bullock of 537 kg and Jenny of 234 kg with provision of being transported in lifted condition.



Demonstration of Animal lifting device

#### Transfer of Technology

Scientists at EPC, ICAR-NRC on Equines have pioneered and institutionalised the technique of collection and cryopreservation of stallion semen in India. Scientists have also standardised the cryopreservation protocols at field level. This technology was demonstrated at Equine Breeding Stud (EBS), Hisar by cryopreserving the Thoroughbred stallion semen. This technique was also taught to the officers and staff of EBS, Hisar. This feat is first of its kind as the semen from the Thoroughbred



stallions was preserved for the first time in the country. Later, this technique was also extended to other exotic breeds maintained at EBS, Hisar for breeding purposes.



*Demonstration and transfer of technology of equine semen freezing to the officers of Equine Breeding Stud, Hisar*

#### **Training to Field Veterinarians for AI in Equines**

There is an increased demand of mules in the areas near Jammu and Katra. These mules are extensively used for carrying pilgrims and goods from Katra to the Vaishno Devi Temple. Looking at the interest of the veterinarians of this area, they were trained for the production of mules using frozen semen of the jacks using AI.



*Training of veterinarians at Jammu for artificial insemination in equines*

#### **Technology of Vermicomposting of Equine Dung**

Utilization of mules for transport in hilly regions leads to



*Demonstration for Vermicomposting with equine dung at Jammu*

deposition of mule dung in the hilly tracks. This is one of the unique problems found in the hilly tracts of tourism and religious importance in India. Composting and vermicomposting may be one of the solutions for this problem and scientists at EPC have expertise in vermicomposting of the equine dung.

In this connection under a DST project, scientists from EPC Bikaner visited these regions and demonstrated the composting and vermicomposting process from mule dung to the Shrine board personnel at Katra.

#### **Events Organised**

##### **Foundation Day Celebration and Kisan Goshti**

Equine Production Campus celebrated its foundation day on 28<sup>th</sup> September 2016 with great fanfare. Brig (Dr) S S Kashyap, Commandant, Equine Breeding Stud, Hisar graced the occasion as Chief Guest. He urged the equine farmers and breeders to save the indigenous horse breeds and to discourage the indiscriminate cross breeding of horses.



*A statuette of horse was unveiled by Brig.(Dr) S S Kashyap., Commandant, EBS, Hisar on the occasion of Foundation Day at EPC, Bikaner*

##### **Release of Technical Bulletin**

A technical bulletin entitled “Cryopreservation of horse and donkey semen” authored by S K Ravi, R A Legha, T R Talluri, R K Dedar, R C Sharma, Yash Pal, B N Tripathi and R K Singh was released by Brig (Dr) Kashyap on this occasion. This bulletin covers the procedures of



*Release of Technical Bulletin*



cryopreservation of stallion semen in farm and field conditions.

### Scientist-Farmer Interactive Meet



Director, ICAR-NRCE addressing the equine farmers

During the interaction, the enthusiastic equine owners from Rajasthan and neighboring states discussed the problems being faced by them in equine health, management and production. Suitable sustainable solutions were provided by the scientific staff.

### Republic Day and Independence Day Celebrations



Republic Day Celebration at EPC, Bikaner

On 15<sup>th</sup> August 2016, the 70<sup>th</sup> Independence Day of our Nation was celebrated with the festivities and fervor by hoisting the national flag. The function was attended by all the scientists and staff of EPC. Dr R A Legha, In-charge, EPC, unfurled the National Flag and encouraged the gathering to work in union to achieve scientific breakthroughs that will benefit the different stakeholder involved in equine husbandry.

### Swachchhata Abhiyan

To accelerate the efforts to achieve universal sanitation and to fulfill Mahatma Gandhi's aspiration of Clean India, the *Swachchh Bharat* mission was launched by the honorable Prime Minister. Under this programme *Swachchhata Pakhawara* was celebrated at the campus by cleaning various sectors of the campus and a schedule was prepared to keep the Campus clean, all through the year.



Staff of EPC participating in Swachchhata Pakhawara

### Tree Plantation Programme

A tree plantation programme was organised at the Campus in collaboration with Mahaveer International, Bikaner (NGO) on 28<sup>th</sup> July, 2016. Scientific and technical staff of the Campus and ICAR-NRCC participated actively in the programme.



Staff of EPC Planting trees at the campus

### Hindi Pakhawara

Various competitions marked the beginning of *Hindi Pakhawara*, on 14 September, 2016. In-charge, *Raj Bhasha*, Dr Vijay Kumar delineated the road map for two weeks long celebration in the inaugural function. Five



Hindi pakhwara programme

different competitions were held and prizes were distributed to the winners.



### International Yoga Day celebrated

As per the Government of India directives, the campus observed International Yoga day on 21<sup>st</sup> June, 2016 along with the staff of ICAR-NRC Camel, Bikaner by participating in the Yoga session organised at ICAR-NRCC, Bikaner. All the staff of EPC have participated with much zeal and performed various *Yogasanas*.

### Extension Activities

#### Health Camps and Field Visits

To address the issues related to the health and production, the centre regularly organises health camps and conducts field visits. Two health camps at farmer's door step in the village Gigasar and Sarvodaya Basti, Bikaner were organised by the institute. The health and production issues were addressed and necessary consultancy services provided.

The equine owners showed keen interest during the camp and they were also educated about the common health problems in equines. Literature pertaining to the health and management of equines was distributed among the farmers.

#### Details of the Health Camps and Filed Visits

Place	Date	Team
Sarvodaya Basti	12/05/2016	R K Dedar Vijay Kumar P A Bala, T R Talluri, J Singh
Gigasar	30/08/2016	P A Bala, T R Talluri, J Singh

#### Implementation of the Mera Gaon Mera Gaurav Scheme

Under the *Mera Gaon Mera Gaurav* programme, the scientists of the campus have adopted 8 villages viz. Kotri, Gigasar, Surdhana Chauhanan, Suradhna Padiharan, Himmatasar, Panpalsar, Hadla Bhatiyar and Hadla Rawlotan of Bikaner district.

Two teams of scientists conducted baseline survey of the villages and acquainted farmers with latest technical knowledge of agriculture and animal husbandry practices through *kisan goshtis* and by distributing the literature. The teams also sensitized them with issues of National interests like *Swachchh Bharat Abhiyan*, climate change, water conservation and crop residue disposal methods, etc.

#### Participation at GRAM

Government of Rajasthan in collaboration with the Federation of Indian Chambers of Commerce & Industry (FICCI) hosted Global Rajasthan Agritech Meet "GRAM" in 2016 at Jaipur, Rajasthan from Nov 9 to 11 2016. GRAM was the single largest agriculture meet in the country that attracted participation of 54500 farmers,



Scientist addressing the farmers at GRAM, Jaipur

18900 visitors, 6 International delegations, 10 international experts and over 200 representatives of corporate business houses. Scientists from EPC participated in the programme and showcased the campus activities.

#### Field Day and Kisan Goshti at Kotada

A field day was organised at Kotada village under the chairmanship of Prof. A K Gahlot, Vice-Chancellor RAJUUVAS on 4<sup>th</sup> Nov 2016.



Scientists of the campus participating at field day

Scientists from EPC also participated and displayed various activities and achievements of EPC in the respective stall.

#### Participation in Melas



राजस्थान पशुचिकित्सा और पशु विज्ञान विश्वविद्यालय एवं उप निदेशक कृषि एवं पदेन परियोजना निदेशक, आत्मा, द्वारा आयोजित कृषि एवं पशु विज्ञान मेला, बीकानेर में 27 फ़रवरी, 2016 को राष्ट्रीय अश्व अनुसंधान केंद्र के उत्पादों एवं तकनीकियों का प्रदर्शन किया गया।





प्रधानमंत्री फसल बीमा योजना के व्यापक प्रचार-प्रसार हेतु कृषि विज्ञान केंद्र, बीकानेर द्वारा आयोजित किसान मेले में 30/04/16 को परिसर ने स्टाल लगा कर प्रदर्शनी लगाया गया।

### New Facilities Created/ Works carried out at the Campus

This year many new facilities were created and pending works have been accomplished under the leadership of the Director, ICAR-NRC on Equines. A pool was constructed for the hydrotherapy of the equines through which musculoskeletal related problems will get a great relief.



*Pool for exercise and hydrotherapy of Equines*

An in-house vermicomposting facility was constructed which will be used for the composting of equine dung under controlled environment.



*Vermicomposting facility at EPC*

Repair of the staff quarters was done. A new generator with 100 KVA capacity was purchased and installed at

the campus for ensuring uninterrupted power supply to the laboratories.



*Renovation of the staff quarters*



*100 KVA Generator facility*



*Cell culture lab facility*

### Awards and Honours

Dr S K Ravi and his team was awarded with the Young Scientist Award for the poster presentation entitled "Effect of fish oil supplementation on certain biochemical parameters in mares" in Equine, Pet and Wild Animal at the Annual Convention of the Indian Society for the study of Animal Reproduction held from 6-8<sup>th</sup> December, 2016 at SVVU, Tirupati - 517 502.

### Training

Dr S K Ravi attended "Hands on Training on In- Vitro Fertilization Technology" organized at NDRI, Karnal from November 15-24, 2016.



## अश्व पालकों के लिए जानकारीयां

भा. कृ. अनु. प. राष्ट्रीय अश्व अनुसंधान केंद्र के अश्व उत्पादन परिसर, बीकानेर में वैज्ञानिकों द्वारा शीतीकरण/हिमीकरण विधि से विभिन्न प्रजाति के अश्वों का वीर्य सालों तक संरक्षित रखने का कार्य सफलतापूर्वक किया जा रहा है जो कि अश्वों के संरक्षण एवं संवर्धन के लिए अतिमहत्वपूर्ण है। केंद्र के सभी अश्वों में कृत्रिम गर्भाधान के अतिरिक्त अश्वपालकों के लिए भी उनकी घोड़ियों में कृत्रिम गर्भाधान की सुविधा केंद्र के द्वारा उपलब्ध करवाई जा रही है। हिमीकृत वीर्य पशुचिकित्सकों के माध्यम से अश्वपालकों के द्वार तक पहुँचाने और अश्वों में कृत्रिम गर्भाधान को लोकप्रिय बनाने के प्रयास लगातार किये जा रहे हैं। इसके साथ ही केंद्र पर अश्वों में गर्भ परीक्षण, प्रजनन संबंधी एवं स्वास्थ्य संबंधी अन्य अश्व विकार के लिए निदान भी सुझाये जा रहे हैं। अश्व उत्पादन परिसर, बीकानेर समय समय पर पशुचिकित्सकों एवं पशुचिकित्सा सहायकों के लिए अश्व उत्पादन एवं अश्व स्वास्थ्य से संबंधित जरूरी प्रशिक्षण भी आयोजित करवाता आ रहा है। मेरा गाँव मेरा गौरव योजना के अन्तर्गत अश्व उत्पादन परिसर, बीकानेर ने वर्तमान में आठ गाँव गोद ले रखे हैं और समय समय पर इन गाँवों में भ्रमण कर कृषि एवं पशु-स्वास्थ्य संबंधित सलाह के अतिरिक्त राष्ट्रीय कार्यक्रम जैसे स्वच्छता, बेटी बचाओ बेटी पढ़ाओ, किसानों के लिए सरकार की लाभकारी योजनाओं के प्रति जागरूकता फैलाने तथा और अन्य समस्याओं के यथासंभव हल उपलब्ध कराने का प्रयास करता है। अश्व-उत्पादन परिसर, बीकानेर में अश्वपालक एवं छात्र-छात्राओं के लिए अश्व उत्पादन संबंधी रख रखाव एवं तकनीकों का प्रदर्शन भी किया जाता है। परिसर के वैज्ञानिक एवं तकनीक अधिकारियों द्वारा पशु स्वास्थ्य शिविर के आयोजन तथा कृषि मेला और कृषि प्रदर्शनी इत्यादि में केंद्र की तकनीकों का प्रदर्शन भी किया जाता है। परिसर के विषय विशेषज्ञों द्वारा टोल फ्री नम्बर पर किसानों को अश्व उत्पादन एवं अश्व स्वास्थ्य संबंधी परामर्श भी दिया जा रहा है।



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