NRCE NEWSLETTER
National Research Centre on Equines
राष्ट्रीय अश्व अनुसंधान केन्द्र
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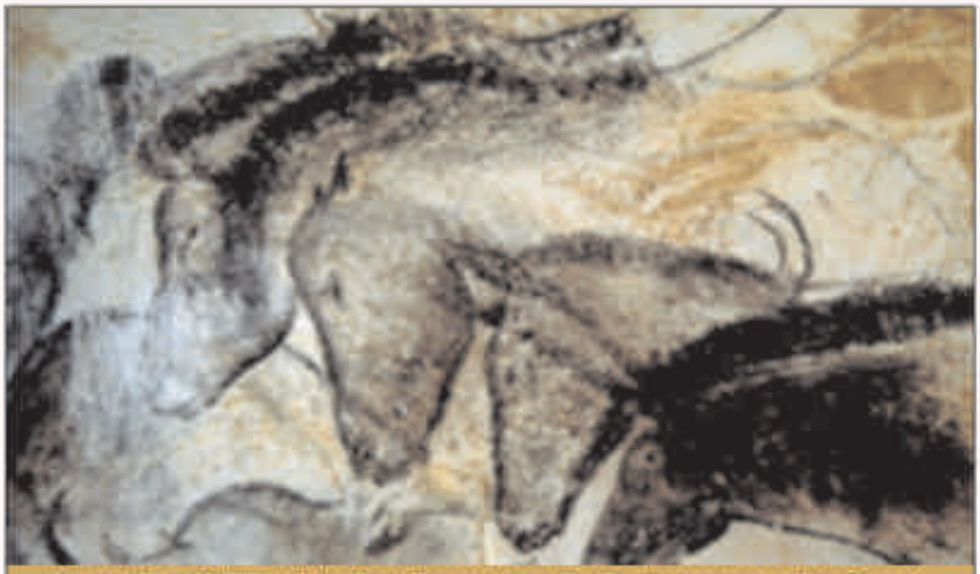
SECTORAL News



Horses from the Hillaire Chamber, Chauvet Cave. (Credit: Photo courtesy of the French Ministry of Culture and Communicatson, Regional Direction for Cultural Affairs, Rhône-Alpes region, Regional Department of Archeology)

Ancient DNA Provides New Insights into Cave Paintings of Horses

Recently, a study proved the existence of white spotted phenotype in pre-domestic horses. Previous studies, only evident the existence of bay and black colour in pre-domestic horses. A cave painting - "The Dappled Horses of Pech-Merle" dates back >25000 years, depicted a white horse with black spot. A team of Scientists from the United Kingdom, Germany, USA, Spain, Russia and Mexico genotyped and analysed nine coat-colour loci in 31 pre-domestic horses dating back as far as 35,000 years ago from Siberia, Eastern and Western Europe and the Iberian Peninsula. This involved analysing bones and teeth specimens from 15 locations. They found that four Pleistocene and two Copper Age samples from Western and Eastern Europe shared a gene associated with leopard spotting, providing the first evidence that spotted horses existed at this time.

Source : Pruvost et al. (2011).PNAS, 108(46):18620-18630.

Hippotherapy picks up in human health and lifestyle - Health benefits of horse riding:

'Hippotherapy', 'Horse-assisted Therapy' or 'Equine-facilitated Therapy', and 'Therapeutic Horseback Riding' refer to the various physical, occupational, and speech therapy treatment strategies that employ horse's movement. A Hippotherapist employs horse's movement in Hippotherapy, so as to improve the cognitive, coordination, balance, and fine motor skills of the patients. The 'therapeutic horseback riding' uses specific riding skills. The movement of the horse is carefully graded at the walk in each treatment for the patient as this movement provides physical and sensory inputs which are variable, rhythmic, and repetitive. The variability of the gait of the horse enables the therapist to grade the degree of input to the patient and use this movement in combination with other treatment strategies to achieve desired therapy goals or functional outcomes. In addition, the 3-D movement of the horse pelvis leads to a movement response in the pelvis of the horse which is similar to the movement patterns of human walking. Hippotherapy is now being inbcreasingly used by "Physical Therapist", "Occupational Therapists" and "Speech and Language Therapist", respectively for physical therapy, occupational therapy, and speech and language therapy.

Source:*http://en.wikipedia.org/wiki/Hippotherapy*; retrieved December 27, 2012

Sex-sorted stallion semen - producing colt or filly: Use of sex-sorted semen in equines is new phenomenon and still not in much use. Of late, a venture of two commercial companies:

JCS Veterinary Reproductive Services Ltd, British Columbia, Canada, and Sexing Technologies, (a Texas-based company) are now sorting out some small hitches before they could offer "sex-sorted stallion semen" that allows horse owners to pick the sex of their future foals as reported recently.. As of now, fresh sex-sorted stallion semen employing high-speed flow cytometer with purity between 90% and 95% (*i.e.*, about 5% of the sorted sperm would not produce a foal of the desired sex). In spite of the limitation that only fresh sex-sorted semen can be used for inseminating mares, the results are still promising.

Source:*http://www.thehorse.com/ViewArticle.aspx?ID=20707*; retrieved October 22, 2012

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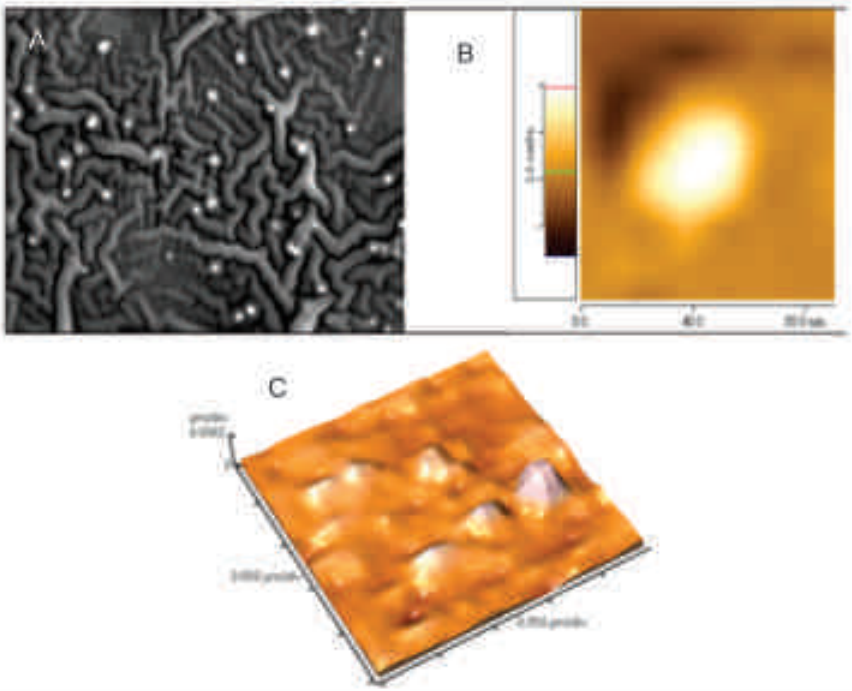
EQUINE HEALTH News

Quinapyramine sulphate-loaded nanoformulation shows enhanced trypanocidal activity

The quinapyraminesulphate is a recommended trypanocidal drug, but also entails untoward side-effects when administered for therapeutic purpose. NRCE formulated nano based delivery system for trypanocidal quinapyramine sulphate drug. Quinapyraminesulphate nanoparticles (QS-NPs) were well formed, regular in shape with small particle size (less than 100nm). The QS-NPs has high drug encapsulation and entrapment efficiency (96.48 %), and drug was in a well-dispersed state. *In vitro* cytotoxicity studies were performed at different concentrations of QS-NPs, dummy nanoparticles and conventional drug in animal cell line (vero cell line) for determining safety and toxicity of the nanoparticles as assessed by resazurin assay. The QS-NPs were highly effective against parasite *Trypanosoma evansi* and shown to kill the parasites at much lower concentrations *in vitro* as well as *in vivo* in mice model. The QS-NPs was found to be non-toxic, bio-compatible, bio-degradable, and physico-chemically stable and is highly effective against parasite *T. evansi* at much reduced dose. Figure shows images of quinapyramine sulphate-loaded sodium alginate nanoparticles viewed under (A) Surface electron microscope (SEM) which shows distinct spherical particles with solid dense structure, and (B) Atomic Force Microscope (AFM) of the representative QS-NPs. (C) Three-dimensional view of AFM image.



Images of quinapyramine sulphate-loaded sodium alginate nanoparticles were viewed under Surface electron microscope (SEM) (A) and Atomic Force Microscope (AFM) (B) and Three-dimensional view of AFM image (C).

Emergence of equine infectious anaemia in India

Equine infectious anaemia (EIA) is a persistent infectious disease of equines caused by Equine infectious anaemia virus (EIAV). EIA is endemic in many countries of European and American continent while it is very rare in Africa. Among Asian countries; EIAV infection has been reported in Japan, China, Thailand, Uzbekistan, Philippines, and Malaysia during 2008-12. Recently (September 2012) an EIA case in a thoroughbred horse near Manesar (Haryana) was reported. The infected animal was immediately segregated and kept in insect-proof shelter following bio-safety measures till their elimination by euthanasia and proper disposal under the provisions of '*Prevention and Control of Infectious and Contagious Diseases in Animals Act 2009*' in coordination with veterinary authorities of the State. Detection of EIA positive equines in India along with incidence of EIA in Asian countries is of great concern in view of the absence of the disease in the region for quite a long period. Therefore, rigorous surveillance and monitoring programme by NRCE and co-operation from State Animal Husbandry and private sector are sought for control of EIA in India.

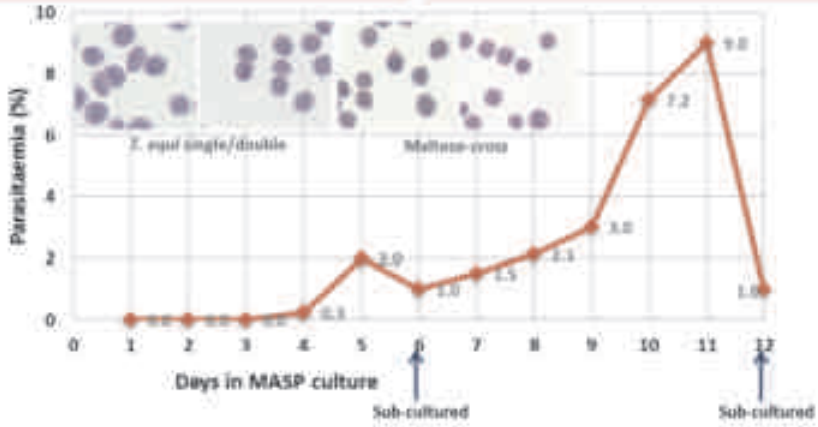
Isolation and characterization of amniotic fluid-derived mesenchymal stem cells in equines

The injuries to musculoskeletal tissues like superficial digital flexor tendon are very common among racehorses. During natural healing process, a scar is formed in the damaged tissue affecting the functional performance, making the horses worthless for racing purpose. The stem cell therapy helps in tissue regeneration and horses return to full functionality after healing. Equine adipose and bone marrow-derived mesenchymal stem cells (MSCs) have been used commercially. Due to ease of isolation, there is an increasing interest in MSCs isolated from extra-embryonic sources, including amniotic fluid, a source not much explored. With this aim NRCE, Hisar initiated a DBT-funded study to isolate and characterize MSCs

from equine amniotic fluid at the time of foaling. Amniotic fluid (AF) was collected from 17 Thoroughbred mares and fibroblastic colonies of MSCs were isolated from 11 samples. AF-derived MSCs (AF-MSCs) were studied for their morphology and growth kinetics. The AF-MSCs were positive for expression of pluripotency markers, viz, *OCT4*, *SOX-2* and *NANOG*. They expressed mesenchymal surface markers CD73, CD90 and CD105 while were negative for CD14, CD34, and CD45. In Flow-Cytometry, the AF-MSCs were found to express CD29, CD90 and were negative for CD34 and CD45. The AF-MSCs induced to osteogenic differentiation stained positive for Von Kossa and Alizarine Red S and showed expression of *Runx2*, *osteopontin*, *osteonectin* and *osteocalcin* genes by RT-PCR. The isolated AF-MSCS were subsequently cryopreserved at different passages and re-evaluated for their mesenchymal properties after cryopreservation and revival. The study established that AF is a rich source of MSCs in equines.

Development of MASP culture system at NRCE – a novel technique for demonstration of *Theileria equi*

Development of MASP cultivation system is a major breakthrough in *Theileria equi* research as it helped the researchers – i) in replacing the animal experimentation system for production of antigen, for various purposes; ii) for maintenance of parasite in laboratory system and; iii) testing the battery of drugs in *in vitro* culture system before attempting *in vivo* experiments with most potent drug. The blood samples for cultures were collected by venipuncture into sterile This MASP cultivation system initiated intra-erythrocytic development of *T. equi* parasite. The parasites were observed 6-10th day of culture. The culture was subcultured subsequently and maintained. By this system, a maximum parasitaemia of 10-11% was achieved.



In vitro MASP cultivation of *T. equi*

Success Story

Vaccine developed for control of abortion in mares due to EHV-1 infection

Indigenous EHV-1 killed oil adjuvanted vaccine was developed incorporating indigenous strain (Hisar-90-7). The candidate vaccine was tested for its safety, innocuity and potency. Initially the vaccine efficacy was evaluated in pregnant BALB/C mice (8 weeks old) and heterologus pathogenic EHV-1 viral strain Raj-98 EHV-1 was used as challenge virus. After successful potency testing in mice model, the vaccine was further tested in pregnant ponies (5 month gestation; *n*=4) at experimental level.

The vaccine dose is 2 ml and inoculated through I/m route on 5, 7 and 9th month of gestation. No fever and other untoward reactions were observed on challenge in vaccinated mares. However, hyperthermia was observed in unvaccinated control ponies (*n*=4) day 2 onwards post challenge. In control group one mare aborted (due to EHV-1 infection) and in another foal died after foaling. The other two ponies of control group gave birth to healthy foals. On the other hand, out of four EHV-1 vaccinated mares (Group-I), three gave birth to healthy foals after challenge and one mare aborted due to EHV-1 infection. This study indicated that inactivated EHV-1 vaccine developed by this centre was safe, potent and diminishes severity of clinical symptom in term of protective immune response for control of abortion in mares due to EHV-1 infection in experimental condition.

The vaccine was validated by extensive field testing in three phases - first phase OEMM EHV-1 vaccine (in 2 ml dose) was inoculated on 5th, 7th and 9th month of pregnant mares as well as in naive fillies. A total of 48 equines (36 pregnant mares and 12 naive fillies) were selected in this study. Out of 36 pregnant mares, 24 mares were immunized with this vaccine and 12 pregnant mares were immunized with *Pneumabort K®* vaccine (a commercial EHV-1 vaccine of Fort Dodge). Six fillies were also immunized with NRCE vaccine while other 6 fillies were kept as non-vaccinated control. There was no post vaccination untoward effect of vaccine in any vaccinated pregnant mares and fillies during the course of vaccination. In second phase - 58 pregnant mares were selected from field. In third phase, 73 pregnant mares (43 indigenous and 30 thoroughbred pregnant mares) at different locations were immunized with this vaccine. All the pregnant mares selected were having negative VN antibody titre on the day of inoculation and reciprocal VN antibody titres (against EHV-1) increased significantly upon primary and booster vaccination as with *Pneumabort K®* and there was no post vaccination untoward effect in the vaccinated pregnant mares. During the course of this study no abortion due to EHV-1 infection was observed in any vaccinated mares and efficacy of this indigenous EHV-1 vaccine was equivalent to *Pneumabort K®*.

VETERINARY TYPE CULTURE CENTRE News

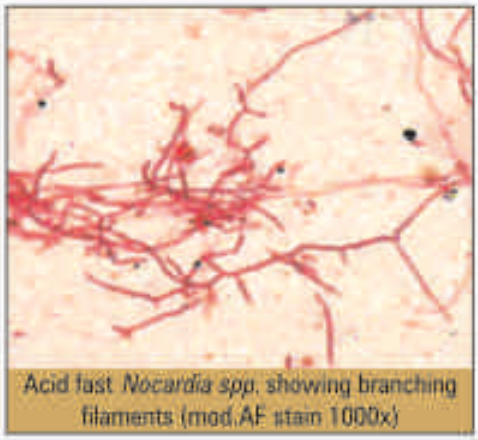
Whole genome sequencing of bacterial isolates

The Veterinary Type Culture Collection, in collaboration with Anand Agricultural University, Gujarat, performed whole genome sequencing (WGS) of chosen bacterial isolates, by utilizing the pyrosequencing platform. We have been able to achieve good coverage and quality genome sequence data for *Bordetella bronchiseptica, Pasteurella multocida and Solmonella* Gallinarum, and the sequence quality parameters of other two genomes is under analysis. Previously completed WGS of *P. multocida* strain (VTCC8AA264) isolated from an outbreak of hemorrhagic septicaemia (HS) in buffalo has also been submitted to Genbank with accession No. ALYC01000001 6, ALYC01000936. The metadata of the isolate is available in Genome Online database no. Gi16627. The detailed bioinformatic analysis of WGS results is underway by using various online tools like RAST and MAKER. This genomic data can be helpful elucidating pathogenesis of the organism, diagnosis, genotyping, detection of virulence and antibiotic resistance.

Acc. No	DIO	ID	Source	Genome Size
BAA1	Eq24E	*Bordetella bronchiseptica*	Nasal swab	5,264,383bp
BAA267	Bu5	*Trueperella pyogenes*	Buffalo pus	NA
BAA264	Bu1	*Pasteurella multocida*	Buffalo Intestine	2,073,865
BAA445	Eq28B	*Actinobacillus equilli*	Nasal swab foal	2,295342
BAA614	Sal40	*Salmonella* Gallinarum	Poultry Fowl Typhoid	4,809,037

First isolation of *Nocardia* spp. from Equine

The bacteriology laboratory at Veterinary Type Culture Centre (VTCC), has isolated *Nocardia asteroides* complex from a post-mortem sample taken from equine granulomatous pneumonic lungs from case of Equine pulmonary nocardiosis. The isolate has been identified as *Nocardia otiti discaviarum* after phenotypic, biochemical studies and 16S sequencing. This is the first report from India for isolation of *Nocardia* spp. from a case of pneumonia in horse mare. The PM lung sample grew classical minute, white, powdery non-hemolytic embedded colonies on Sheep Blood Agar. Nocardiae are ubiquitous

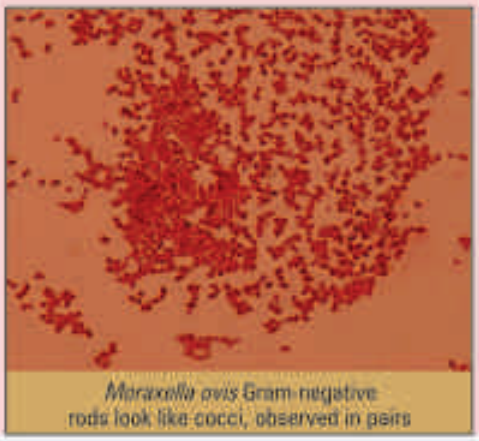


Acid fast *Nocardia spp.* showing branching filaments (mod.AF stain 1000x)

Isolation and identification of *Moraxella ovis* from keratoconjunctivitis in sheep

Infectious bovine keratoconjunctivitis (IBK), commonly known as pinkeye, is a disease of cattle and other ruminants, responsible for economic losses as a result of low weaning weights or blindness and the value of stock decreases. The disease is caused by *Moraxella bovis* and other members of the genus. *Moraxella* are short, plump, Gram-negative rods, characteristically observed in pairs (Fig). We were able to isolate strains of *Moraxella ovis* from cases of keratoconjunctivitis in sheep from a nomadic herd in remote Gulmarg valley (J & K). The plump rods almost look like cocci (Fig). As can be seen in figure, disease can be identified by redness in the outer edges of the eye, squinting, tearing and clouding of the cornea. Pinkeye-associated bacteria are opportunistic members of the normal ocular flora and cause disease following injury to the cornea by UV rays, dirt, insects and feed particles. The isolate has been accessioned in the VTCC.

Infectious bovine keratoconjunctivitis IBK infection in sheep



Moraxella ovis Gram-negative rods look like cocci, observed in pairs

Veterinary Microbes reposted at VTCC

Veterinary Type Culture Collection (VTCC) has a mandated of long-term reposition and distribution of characterized veterinary microbes. In this endeavor, VTCC characterized and reposted total 1105 veterinary microbe, as follows:

Veterinary Microbes	Total numbers reposted
Bacteria	601
Viruses	117
Recombinant clones	260
Phage library	27
Genomic DNA	100
Total	**1105**

First time isolations/identification of bacterial pathogens:

a) From Horse/foal

Bacillus cereus; *Enterococcus asini*; *Bordetella bronchiseptica*; *Corynebacterium pseudotuberculosis* and *Corynebacterium bovis*; *Actinobacillus equilli* (from foal), *Nocardia otiti discaviarum*.

b) From Buffalo

Trueperella pyogenes; *Pasteurella multocida* sub spp. *multocida* B:2 serotype.

c) From Pig

Exiguobacterium spp (first report from India); *Staphylococcus hyicus*.

d) From goat

Methicillin-resistant coagulase negative *Staphylococcus sciuri*.

Detection of Classical Swine Fever from field outbreaks

Classical swine fever (CSF) is a highly contagious viral disease of swine caused by classical swine fever virus (CSFV).The disease is prevalent in many parts of the world including India with majority of the outbreaks being reported from North Eastern states. A total of 26 samples collected from various outbreaks of Haryana and Delhi were tested for CSFV targeting NS5B and E2 genes. Specific amplicons of 424 and 309 bp were observed in positive samples for NS5B and E2 genes, respectively. Out of 26 samples tested 15 were positive of CSFV. Sequencing of the positive samples is underway so as to ascertain the genotype of the currently circulating virulent virus.

Marker 100 bp

Lane1 = Lymphnode

Lane2= Spleen

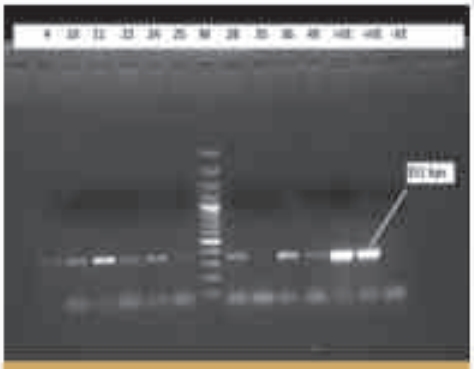
Lane 3= Positive control (IVRI challenge virus)

Lane 4= Negative control

Amplification of CSFV

Investigation of PPR virus in donkey, sheep and goat samples from villages around Bikaner

A small survey was conducted to ascertain the status of PPR virus and its antibodies in field animals living in close proximity in the aftermath of the recent infections occurring in unrelated animal species. In this context, sixty biological samples from donkeys, sheep & goats were collected from villages surrounding Bikaner and were processed for detection of PPR virus antigen and antibodies. None of the 11 donkey samples were found positive for PPR antigen or antibodies by sandwich and competitive ELISA, respectively. Out of the 28 sheep samples, 5 were positive for PPR antigen by sandwich-ELISA as well as by RT-PCR targeting the N-gene, while, 19 were positive for PPR antibodies by c-ELISA. Analysis of the 21 goat serum samples, yielded 5 positive samples for PPR antigen while only 4 were positive for PPR antigen by RT-PCR targeting the N-gene, but 16 goats' samples were positive for PPR antibodies in c-ELISA. Six animals [Sheep (3) & Goats (3)] were positive for both PPR antigen and antibodies. Although none of the donkey samples were positive for PPRV, however the presence of PPR antigen and antibodies in small ruminants, (both sheep and goats) establishes them to be the primary foci of PPRV infection which could act as reservoirs for the transmission of the virus to other unrelated animals living in close proximity in the field conditions.



RT-PCR for detection of PPRV targeting N-gene. Samples: 4, 10, 11, 22 24, 25, 28, 36, 49- PPRV positive samples; Sample: 35 - negative

EQUINE PRODUCTION News

Cryopreservation of equine semen from good quality Marwari and Kathiawari stallions at Farmer's door

NRCE provides AI services to equine owners at NRCE Hisar and EPC Bikaner. In order to provide good quality semen doses for AI, A team of scientists (Dr S. K. Ravi and Dr R. A. Legha) visited Dundlod Stud Farm, Jhunjhunu, Rajasthan to cryopreserve semen from good quality Marwari stallions during March 27-30, 2012. A total of 102 semen doses from elite Marwari stallion have been prepared, cryopreserved successfully at farmer's door and brought to EPC, Bikaner.

The team also visited Kathiawari Horse Breeding Farm, Junagadh, Gujarat to cryopreserve semen from Kathiawari stallions during 27th June to 5th July, 2012. A total of 90 semen doses from elite Kathiawari stallion have been prepared, cryopreserved successfully for first time and brought to EPC, Bikaner.

Sustainable utilization of mule power for chaffing operation through mechanical gear system

In India, use of mules for agricultural operations is limited to transportation only. They remain idle for some time on daily basis creating economic burden to the farmer. Deployment of mules in agro-processing could be an alternative option for their optimum utilization. This study was conducted on use of mule power for chaffing green bajra straw with the help of a rotary gear complex, driven by a local mule of 350 kg body weight. The operation was performed for 45 min (9.30-10.15 AM) in a cool and comfortable environmental condition. The physiological response of the mule at the end of the operation exhibited significant escalation in pulse rate, respiration rate and body temperature but mules did not exhibit any physiological stress. No significant changes were observed in the blood sugar, urea, cholesterol and lactate dehydrogenase (LDH) contents of working mules whereas content of total protein and albumin increased significantly after work in mules. The average output capacity of chopped bajra straw in rotary mode chaff cutter was 660 kg/h. But, it may not be as economic as electric chaff-cutter for chaffing operation. However, due to unavailability/shortage of electric power in rural remote areas, it would be helpful and eco-friendly to utilize those mules/equines in rotary mode operations during idle hours, which are reared by the farmers for other purposes i.e. transportation, pack load, riding etc. Also work of chaff cutting is mainly done by rural ladies. Use of mules in chaff cutting will definitely help to reduce drudgery. It would compensate the maintenance cost of the mules during idle period. Hence, deployment of mules for operating a chaff cutter in rotary mode of operation is a viable option for sustainable utilization of equine power.

Utilization of mule power for chaffing of fodder

Ashvarohan Jagriti Yatra- From Barnala to Pushkar

A long horse journey was planned by a team of young horse owners Mr Manu Sharma, Mr Param Gill, Mr Arpi Gill and Mr Raghu Chahar. Their aim was to popularize horse riding, perseverance and endurance power of Marwari horse. Riding time was kept 5 hours in the morning, and 2 hours in the evening and total 614 km were travelled in 12 days ride with an average of 51 km/day. NRCE team (Dr Vijay Kumar and Dr Ramesh Dedar) monitored the health status of the horse throughout the journey along with related hemato-biochemical and physiological parameter. All the parameters remained in normal range throughout the journey except initial 2 - 3 days of conditioning period. During entire journey, speed of horse was kept within aerobic limits, so the blood lactate level remained below lactate threshold level. Diet of horse was adjusted as per the aerobic requirement; readily available source for lactate production was reduced and fat was included in diet. Daily body weight difference between morning and evening was up to 20 kg and electrolytes were supplemented with drinking water to recover the electrolyte loss. The whole body weight loss during the entire journey was 20 kg in 12 days.

This long horse journey has attracted attention of people and media throughout the way. The equine farmers at many places welcomed the journey

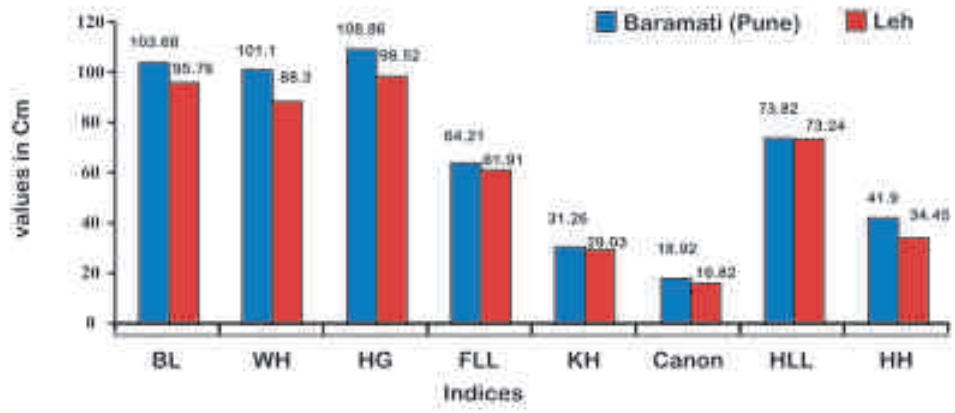
and message regarding keeping horses for riding was spread all the way through the media attention. Through this journey, Marwari horse proved that it has stamina, perseverance and endurance level equal to any internationally reputed sports breed of horse especially for long travel.

Phenotypic characterization of local donkeys

Fifteen different biometric indices of local donkey populations available both at Leh and Baramati were evaluated for their phenotypic traits. Geographically both the locations are quite distinct from each other. Due to difficult terrains, donkeys in Leh regions are expected to remain confined in the hilly region only, while donkeys available in Baramati region were bought by their owners from different states namely Gujarat, Uttar Pradesh, Rajasthan, etc. from animal fairs/traders for using in grape farming and other miscellaneous works.

Coat Colour: Coat colour of most of donkeys at Baramati was grey, [light or dark (59%) with and without dark strip on back (22 and 20 % respectively)], large white (39%) and brown (2%) while, donkeys available at Leh were mainly dark grey (42%), brown (42%) and black (16%) in colour.

Biometric indices: Comparative biometric analysis revealed that among both these local populations of donkeys available at Baramati areas were also significantly taller and bigger in size than at Leh area. Except foreleg length, hind leg length, ear length and hoof width, other biometric indices were significantly higher in Baramati donkeys than Leh donkeys. This information along with genotyping information will be quite useful in finally defining and identifying the local population as separate clusters or breed.

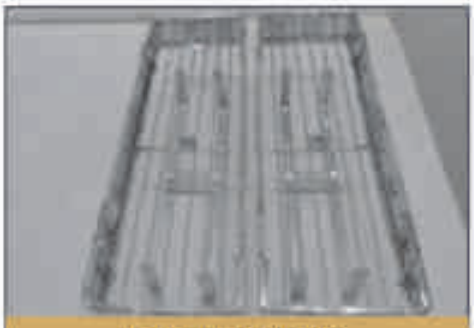


Biometric analysis of donkeys from Leh and Baramati area

Low cost device for equine semen cryopreservation developed at NRCE

Equine Production Campus, Bikaner has developed an easy technique of equine semen freezing in field as well as farm conditions. Scientists at NRCE fabricated two freezing racks made of wires and stainless steel. The size of the racks [wire rack:45cmx32cmx3cm (lxbxh); steel rack: 38cmx14cmx4cm (lxbxh)] weredesigned according to size of freezing box. To keep the freezing rack at proper height, a stand of 6 cm height was also fabricated. A total of 250 and 225 straws can be placed on wire rack and steel rack, respectively for cryopreservation. The semen from 7 NRCE Marwari breed stallions was examined for seminal characteristics and processed for semen cryopreservation. The equal numbers of straws filled with same ejaculate from each stallion were placed on both the racks for freezing. The post-thaw sperm motility observed in freezing wire rack and steel rack were 37.5±2.42 and 36±2.53%, respectively, having no significant difference. The results revealed that both the freezing racks fabricated by NRCE can be successfully used for semen freezing on Ln2 vapours effectively. The cost of freezing wire rack and steel rack was rupees 200 and 400, respectively which about 10-15 times cheaper from commercially available semen freezing straws can be cryopreserved and it is very easy to place the straw and also shift the cryopreserved straws from box to container.

Fabricated wire rack



Fabricated steel racks

Commercially available steel rack

Successful utilization of equine dung for preparation of vermicompost

Equine Production Campus, Bikaner is maintaining about 100 horses and donkeys whose dung can be utilized in making compost. Equine dung – due to low moisture content and poor water absorption capacity - does not decompose properly and cannot be utilized directly as manure in crop field. Keeping in view the sufficient availability of equine dung for composting and problem of disposal of equines dung from farm, EPC Bikaner initiated the trial of vermicomposting in trenches. For vermicomposting, fresh equine and cow dung was utilized which was moistened for 15 days prior to addition of earthworms. Partly decomposed dung was filled in trenches of dimensions 15x2x1 feet. The study was conducted on three treatments as *Treatment 1*- equine dung alone; *Treatment 2*- 50% equine dung + 50% cow dung; *Treatment 3*- cow dung alone. About 60kg earthworms were applied equally in each trench on the top layer of the filled material and covered with tree leaves. After three months of decomposting with appropriate interventions, the sample of prepared vermicompost were analyzed and found that vermicompost prepared from equine dung was as good as prepared from cow dung. The capacity of one vermin-bed is about 14 quintal of raw dung and quantity of prepared vermicompost from one bed is about 10 quintals after a period of three months.

Vermicompost beds

Initiation of mushroom (Dhingari) production on mixture of equine dung and wheat straw:

Equine dung is generally a waste at equine owners' door. To utilize equine dung for income generation of equine owners, a trial for production of mushroom (dhingari) using equine dung was conducted. Spawn of Dhingari mushroom was received from SKRAU, ARS Sri Ganga Nagar. The trial was conducted in three groups viz. fresh equine dung, fresh equine dung and wheat straw mix and neem leaves. The medium was treated in hot water and after cooling equal quantity of spawn was mixed in each group. It was observed that after one week spawn started spreading in all medium but growth was much faster in fresh equine dung followed by neem leaves and fresh dung. The bags were opened after two weeks. Mushroom buds started growing in group 2 from all sides of bag after 4-6 days. In group 1 and 3, growth was very slow and stunted. The cultivated dhingari mushroom was harvested, sun-dried and packed in polythene bags. The study indicates that dhingari mushroom can be successfully grown on equine dung in combination with wheat straw.

Sun-dried mushroom in polythene packets

Dhingari (mushroom) on mixture of equine dung and wheat straw

INSTITUTIONAL News

Technologies developed at National Research Centre on Equines geared up for commercialization

MoA signing with NRDC for technology transfer and commercialization of technologies

National Research Centre on Equines, Hisar is actively involved in research on equine health and production since its inception. Many diagnostics kits, vaccines and packages of practices have been developed by the dedicated team of NRCE scientists for stakeholders and these technologies are ready for transfer and commercialization. The National Research Development Corporation (NRDC), New Delhi, a Govt of India Enterprise, having expertise in the area of technology transfer & commercialization has collaborated with NRCE, Hisar. A Memorandum of Agreement (MoA) for technology transfer & commercialization of technologies has been signed between NRDC and NRCE on August 7, 2012. Dr Rita Kumar, Chairman & Managing Director NRDC and Dr R. K. Singh, Director NRCE, signed the MoA. Under the MOA necessary steps will be taken for management, development, promotion and commercial exploitation of technologies developed by NRCE in complementary mode, so as, the technologies should reach to the stakeholders. List of technologies under MoA is as under:

1. A pregnancy diagnostic kit for equine, based on detection of eCG by ELISA.
2. Monoclonal antibody based blocking ELISA for detection of EHV-1 infection.
3. Monoclonal antibody based ELISA for diagnosis of rota virus infection in equines.
4. Recombinant antigen based ELISA kit for diagnosis of *Theileria equi* infection in equines.
5. Updated Equine Influenza Vaccine.
6. Equine Herpes Virus-1 vaccine.
7. Recombinant protein based ELISA for diagnosis of EIA.
8. Recombinant protein based ELISA for differentiation of EHV-1 and EHV-4 infections.

World Veterinary Day Celebration at NRCE

NRCE celebrated XIII World Veterinary Day on April, 28, 2012. The theme for XIII World Veterinary Day for 2012 was "Antimicrobial Resistance". On this occasion Dr V. A. Srinivasan, Research Director, Indian Immunological Limited, Dr Gaya Prasad ADG (AH) ICAR, Dr H. K. Pradhan, Consultant, WHO (India), and Dr R. K. Sethi Director CIRB were present as the guest of honor. Dr V. A. Srinivasan, Research Director, Indian Immunological Limited emphasized on the role of veterinary profession and their service to mankind. Dr Gaya Prasad stated that world veterinary day is a symbolic recognition for veterinarians and those who are related with animal husbandry, biochemistry, genetics, breeding, nutrition and other related disciplines. He stated that in recent past drug resistance in animals and poultry was a major concern and thus "*Antimicrobial Resistance*" was selected as theme for 13th World Veterinary Day. Dr H. K. Pradhan, in his speech said that veterinarians play an important role to serve the society with a purpose to augment the production and productivity of animals. Veterinarians have developed different vaccines like sheep pox vaccine, PPR vaccine and diagnostic kits for different diseases and now we are not dependent on imported diagnostic kits.

XIII World Veterinary Day celebration at NRCE

Institute Management Committee meeting

The 34th meeting of the IMC was held at NRCE, Hisar under the Chairmanship of Dr R.K. Singh, Director, NRCE on 25 February, 2012. The members of the committee who attended the meeting were Dr G.K. Singh, Dean, Vety. College, GBPUA&T, Pantnagar, Dr R. Sanwal,

Principal Scientist, ARCCS & WRI, Bikaner; Dr V.K. Sharma, F&AO,IASRI, New Delhi; DrYash Pal, Sr. Scientist & I/c EPC, Bikaner and Sh. R.B. Saxena, Admn. Officer, NRCE, Hisar. The committee was appraised regarding various issues of the Centre that required immediate attention. The IMC agreed on creation of duplicate off-site remote repository of Veterinary Microbes, approval for commercialization of technologies through NRDC etc.

XV Research Advisory Committee meeting

XV Research Advisory Committee meeting of the Centre was held under the Chairmanship of Dr S.K. Dwivedi, Ex-Director, NRCE, Hisar on February 25, 2012. The RAC members who participated in the meeting included Dr G. Dhinakar Raj, Dr Arun Varma, Col (Dr) Devender Kumar, Dr S.K. Agarwal, Dr R.K. Singh, Director (NRCE) and Col (Dr) Umaid Singh Rathore. Generation of

RAC meeting in progress

demand-driven technologies for the benefit of equine fraternity should be the priority agenda of the institute. The Chairman also expressed concern over the dwindling equine population and emphasized that there is a need to develop interventional strategies to stop or slow down the pace of decline in equine population. He further emphasized that the NRCE should identify the challenges being faced by he equine sector and work towards providing solutions to these challenges in the XII plan.

Quinquennial Review Team (QRT) meeting

The QRT as constituted by the Director General, ICAR *vide* letter no. 24-3/2012-IA-I dt 30.07.2012 to review the work done by NRC on Equines, Hisar for the period from April, 2007 to March 2012,was headed by Dr R.N. Sreenivas Gowda, Ex-Vice Chancellor, Karnataka Veterinary Animal and Fisheries Sciences University (KVAFSU), Nandinagar, Bidar. The QRT team had four meeting at Main Campus, Hisar and Equine Production centre (sub-campus), Bikaner between Sept., 2012 and Feb., 2013. The committee visited all research laboratories and had discussion with individual scientists regarding their research projects and problems faced by them in doing their work. The QR Team also had an opportunity to discuss with equine owners during health camp organized at Bikaner Campuses. The committee strongly recommended the need of increasing the strength of regular administrative, technical and supporting staff both at Hisar and Bikaner. Establishment of regional stations of NRCE in equine populated areas and separation of VTCC from NRCE were other important recommendations. The committee emphasized that there is an urgent need to do more systematic work in the field of equine production QRT report presented by Chairman in Institute management committee meeting and submitted to Council.

QRT meeting in progress

CL Davis Foundation lecture at NRCE

One-day satellite seminar (CL Davis Foundation Lecture) on topic "Pathology of aquatic animals, farmed and laboratory fish including integrated aquaculture and waste management" under the auspices of Indian Association of Veterinary Pathologists was held at National Research Centre on Equines on November 8, 2012. The distinguished speaker for the seminar was MAJ Eric D. Lombardini VMD, MSc, DACVP, DACVPM; Chief, Divisions of Comparative Pathology & Veterinary Medical Research, Armed Forces Research Institute of Medical Sciences (AFRIMS), Bangkok, Thailand. Dr R. K.Singh, Director NRCE was patron of the seminar while Dr NitinVirmani and Dr R. K. Vaid worked as Co-organizing secretary for the event. This satellite seminar was attended by scientists from the field of aquatic fauna and through knowledge on understanding the futurology of piscine model of animal diseases as well as understanding pathobiology of diseases/pathogens of aquatic animals.

हिन्दी पखवाड़ा का आयोजन

केन्द्र में 1-12 अक्टूबर 2012 को हिन्दी पखवाड़ा आयोजित किया गया। इस अवसर पर केन्द्र में हिन्दी के अधिकाधिक प्रयोग हेतु हिन्दी भाषा से संबंधित विभिन्न स्पर्धाओं का आयोजन किया गया। 1 अक्टूबर 2012 को आयोजित हिन्दी पखवाड़ा उदघाटन समारोह में केन्द्र के निदेशक डा. राजकुमार सिंह, डा. राधेश्याम शुक्ल, सेवानिवृत्त प्राध्यापक, डा. मधुसूदन पाटिल, प्रोफेसर, जाट कालेज, डा. वंदना पाण्डे, जन संपर्क विभागाध्यक्ष, गुरू जम्भेश्वर विज्ञान एवं प्रौद्योगिक विश्वविद्यालय ने दीप प्रज्जवलित करके कार्यक्रम का शुभारम्भ किया। कार्यक्रम के शुभावसर पर डा. मधुसूदन पाटिल ने हिन्दी भाषा की सांविधानिक स्थिति पर प्रकाश डाला। डा. वंदना पाण्डे ने हिन्दी की दशा व दिशा बताते हुए कहा कि हिन्दी केवल भाषा नहीं बल्कि एक सांस्कृतिक परम्परा बन चुकी है जो अन्य कई भाषाओं को अपने अन्दर समाहित कर बहुत सशक्त बन चुकी है। डा शुक्ल ने हिन्दी ही क्यों विषय पर अपने विचार व्यक्त किए और हिन्दी के महत्व को विस्तार से चर्चा की। इस अवसर पर केन्द्र के निदेशक डा. राजकुमार सिंह ने केन्द्र में हिन्दी के उपयोग को अधिक कारगर बनाने के लिए कई सुझाव दिए तथा केन्द्र में हिन्दी की प्रगति की वर्तमान स्थिति से अवगत कराया। हिन्दी पखवाड़ा के दौरान निबन्ध प्रतियोगिता, वाद-विवाद प्रतियोगिता, सुलेख एवं श्रुतलेख प्रतियोगिता, भाषण प्रतियोगिता आदि में केन्द्रीय कार्यालयों के कर्मचारियों एवं केन्द्र के सभी वर्गों के कर्मचारियों ने बढ़-चढ़ कर हिस्सा लिया।

हिन्दी पखवाड़ा का आयोजन

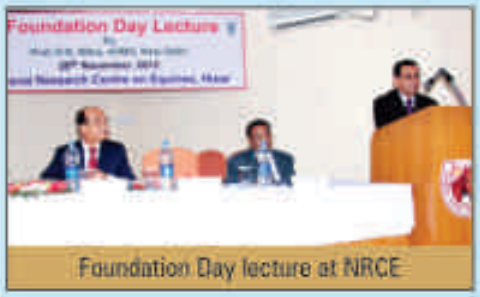
Farm Innovators Day at EPC Bikaner

Farm Innovators Day was organized at Sub Campus, Bikaner on October 15, 2012. The programme was attended by 48 progressive equine owners and representatives of horse breeding society of Rajasthan. Sh. Narayan Singh Manaklao, Ex- MP and Col. Umaid Singh from Jodhpur also participated in meeting. Donkey Show/health camp was also organized on the same day in which 17 donkey farmers along with their 18 animals participated. The animals were examined for various alignments by the experts. During the Farm Innovator's Day, QRT team members under the chairmanship Dr R.N.S. Gowda, Former Vice Chancellor of KVASFU, Bidar and Scientists of the Centre interacted with the equine owners on various aspects of equine husbandry including health and management of equines and problems faced in equine husbandry.


Farm Innovators Day at EPC Bikaner

Foundation Day lecture at NRCE

On the occasion of foundation day of NRCE on November 26, 2012 Foundation day lecture was organized at NRCE. Prof. D. K. Mitra, Department of Transplant Immunology, AIIMS, New Delhi delivered a foundation day lecture on "Emerging Human Health Issues". Brigadier Desh Raj, Equine Breeding Stud, Hisar and Dr R. K. Sethi, Director CIRB were present on this occasion as Guest-of-Honour. On this occasion, the plantation was also done by the Chief Guest and other dignitaries near animal shed complex at NRCE.



Foundation Day lecture at NRCE

Training course on Artificial Insemination and Pregnancy Diagnosis in Equines

Six days training course on *"Artificial Insemination & Pregnancy Diagnosis in Equines"* was organized at EPC Bikaner. The training programme was attended by Veterinary and Livestock Development (VLD) staffs of State Animal Husbandry Department from May 21-26, 2012 at NRCE, Bikaner sub campus.


VLD staff trainees at NRCE, Bikaner sub campus attending the training lecture

Belgians Team visits EPC, Bikaner

Team from Belgium visited EPC, Bikaner to record demonstration of NRCE activities including collection of semen and its freezing for promotion of breed conservation for documentary film on October 25-, 2012. Team from Belgium praised the upkeep of animal farm and the campus.

Belgium Team along with Sh. Raguvendra Singh and staff of EPC, Bikaner Bikaner

NRCE Initiated OIE Twinning Laboratory Programme

The OIE - The World Organisation for Animal Health (Paris, France) - initiated OIE Laboratory Twinning Programme with the aim to create opportunities for developing and in-transition countries to develop laboratory diagnostic methods based on the OIE Standards. Each Twinning project is a partnership between an OIE Reference Laboratory and a Candidate Laboratory. In this endeavor, National Research Centre on Equines (NRCE) initiated the OIE-sponsored twinning project on - Equine Piroplasmosis with National Research Centre for Protozoan diseases (NRCPD), Japan (2010-2013); Glanders with Friedrich LoefflerInsitut (FLI), Germany (2012-2015) and Equine influenza with Animal Health Trust (AHT), UK (2012-2015). OIE Laboratory Twinning Program on Equine Piroplasmosis is the first such project awarded by the OIE to the country.

BTC, Bengaluru organises NRCE Cup race

NRCE Cup function at Bangalore Turf Club was organized on January 26, 2013 at Bangalore. The NRCE Cup function, its cash prizes and this show are conducted every year by BTC. A total of eight races were planned on **"NRCE CUP"** date including **"the Kimmane Bangalore Derby"** race. This race was for 1400 Meters and 13 horses participated. There were five prizes for winners. The first prize winner was given NRCE CUP and a cash prize of Rupees two lakh sixty four thousand (₹ 2,64,000/) only, followed by 2nd, 3rd, 4th and 5th prizes which were cash prize of ₹ 1,32,000/-, ₹ 66,000/-, ₹ 39,600/- and ₹ 13,200/-, respectively. NRCE CUP was presented to the first winner by Dr B.K. Singh, Principal Scientist & I/c Equine Health Unit on behalf of Director, NRCE immediately after this race was finished. Other dignitaries present on this occasion were Chairman, Secretary and other Staff members of BTC, Bengaluru.

Dr B.K. Singh Presenting NRCE Cup at BTC, Bengaluru

International Workshop for SAARC countries participants under OIE Twinning Laboratory Program on Equine Piroplasmosis at NRCE, Hisar, India

Equine piroplasmosis is an acute, sub-acute, or chronic tick-borne disease of equidae, caused by intra-erythrocytic protozoa: *Theileria equi* or *Babesia caballi*. The disease condition caused by *T. equi* is highly endemic in Indian equine population entailing heavy economic loses to equine owners and attribute restriction on international movement of horses. Under this OIE Twinning Project, NRCE has organized this December 8, 2012. This workshop was attended by one participant each from Afghanistan, Nepal, Bhutan, Bangladesh and Sri Lanka, and seven participants from state animal husbandry department of Haryana, Rajasthan, Gujarat; DAHD&F (Quarantine Officers) and Turf Club Authority of India. Prof. I. Igarashi from NRCPD, Japan facilitated this International Workshop at NRCE as an OIE expert on Equine Piroplasmosis. Eventually development of these state-of-the-art diagnostic facilities and capabilities will pave the way for NRCE in applying to the OIE for Reference Laboratory on equine piroplasmosis. Dr Sanjay Kumar and Dr Rajender Kumar were Workshop coordinator and Secretary, respectively while Dr RK Singh and Prof. I. Igarashi facilitated this workshop.

Inauguration of International Workshop on "Molecular diagnosis on Equine Piroplasmosis" for the SAARC Country Participants

EXTENSION News

Equine Health Camps & Kisan Goshthis Organized

S. No.	Place	Date	Activities
1.	Nagaur, Rajasthan	January 28, 2012	During Equine Health Camps the animals were examined for various alignments by the experts from NRCE. Basic treatmentwas provided to diseased animals and free medicines, deworming tablets and mineral mixture was provided to equine owners free of cost at the camp. Pregnancy diagnosis was done during the camps. During Kisan Goshthis, equine owners interacted with experts from NRCE on various issues related to health, production and management of equine and the constraints faced by them in equine husbandry.
2.	Hanumangarh, Rajasthan	February 20-21, 2012	
3.	Tilwara Balotra, Rajasthan	March 16-19, 2012	
4.	Rajli, Haryana	June 16, 2012	
5.	Sonmarg, Jammu and Kashmir	July 20, 2012	
6.	Baltal, Jammu and Kashmir	July 21-22, 2012	
7.	Gulmarg, Jammu and Kashmir	July 23, 2012	
8.	Chandanwadi, Jammu and Kashmir	July 25, 2012	
9.	Meham, Haryana	September 28, 2012	
10.	Jodhpur, Rajasthan	September 30, 2012	
11.	Meham, Haryana	October 10, 2012	
12.	Bikaner, Rajasthan	October 15, 2012	
13.	Pushkar, Rajasthan	November 23-24, 2012	
14.	Sahpini , Rajasthan	November 30, 2012	
15	Pirkamariya, Rajasthan	December 10, 2012	

Equine Health Camp at Rajli

Equine Health Camp at Jodhpur

Participation in Exhibitions and Fairs

S. No.	Place	Date	Activities
1.	CIRB Buffalo Mela, Hisar	February 01, 2012	Exhibits and extension material on various aspects of equine husbandry and management were displayed for the benefit of equine owners. Exhibition stall also displayed different technologies developed at NRCE. Equine owners meet and interacted with scientists on various aspects of equine husbandry.
2.	Bhatner Ashwa Mela Hanumangarh, Rajasthan	February 20-21 2012	
3.	Pusa Krishi Vigyan Mela at IARI New Delhi	March 1-3, 2012	
4.	Kisan Mela at SKUAST, Jammu	March 19-20, 2012	
5.	Pandusar, Bikaner, Rajasthan	August, 24, 2012	
6.	CAZRI, Jodhpur, Rajasthan	September 12,2013	
7.	Pushkar Animal Fair, Rajasthan	November 23-24, 2012	
8.	Agriculture Education day at CIRB, Hisar, Haryana	November 27, 2012	
9.	Kisan Diwas, NDRI, Karnal	December 23, 2012	

Governor J&K visiting NRCE Stall at SKUAST Kisan Mela

NRCE exhibition stall at CIRB Hisar

Equine Health Camp in J&K by team of NRCE

A team of NRCE Scientists - Dr B. K. Singh, Dr NitinVirmani, Dr R.K. Vaid and Dr A.A.Raut - visited Jammu & Kashmir with aim of organizing Equine Heath Camp as a part of rendering equine welfare activities during Shri Amarnath Ji Yatra (July, 18-27, 2012). This activity was also necessary for disease surveillance as large numbers of ponies were going to gather on this occasion. State Animal Husbandry Department (Kashmir-Srinagar), Govt of J&K and Shri Amarnath Ji Shrine Board supported in organizing equine health camp at different places of yatra en-route. A total of four camps were organized at Sonmarg; Baltal; Gulmarg and Chandanbari and 233 equines were examined. Relevant bio-samples (serum, nasal swabs etc) were also collected from these animals and treatment was given to sick animals. All the equines which were brought for their health checkup were provided free anthelmentics (antiparasitic drugs) treatment along with a packet of mineral mixtures (for nutritional propose). Serum samples of these animals were tested at NRCE and were negative for equine infectious anaemia, equine influenza, *Salmonella* Abortusequi and *Brucella* antibodies. However, 10.72% (25/233) equines were seropositive against *Trypanosoma* infection, 9.4% (22/233) for equine herpesvirus-1 and 8.58% for equine piroplasmosis. Information bulletins and pamphlets detailing the various aspects of equine health and management were also distributed to equine owners. The standard package and practices of equine husbandry were also discussed with the equine owners. NRCE scientists interacted equine owners about different problems faced by equine owners in equine husbandry and management.

Equine Health Camp at Chandanvari

Artificial Insemination services to equine farmers at NRCE

National Research Centre on Equine is providing facilities Artificial Insemination in Equines facilities at NRCE, Hisar and Equine production Campus, Bikaner free of cost to equine owners equine owners. These facilities are provided to equine owners for production of superior quality of true-to-breed horses and superior quality of mules with aim to provide sustainable livelihood to resource poor and underprivileged equine owners. NRCE has cryopreserved semen of superior stallions of Marwari horses and exotic (Poitu) donkeys. Artificial insemination is aimed towards production of superior quality horses, mules and donkeys using cryopreserved semen of true-to-breed indigenous stallions and exotic donkeys. NRCE is also providing facilities of pregnancy diagnosis in equines at Hisar and Equine Production Campus, Bikaner. Equine owners con contact NRCE toll-free help line number 1800-180-1233 (Hisar) and 1800-180-6225 (Bikaner) to avail artificial insemination services in equines provided at NRCE.

Artificial Insemination in mare at NRCE, Hisar

OTHER News

Award/Training & Education/Patents filed/Visits abroad

Awards:

Dr Birendra Kumar Singh, Principal Scientist, NRCE, Hisar was elected ***Fellow of Indian Virological Society (FIVS)*** for the year 2012 for his outstanding contribution in Animal Virus Research. He was conferred this award during XXI National Conference of Indian Virological Society **"VIROCON-2012"** held at Indian Veterinary Research Institute, Mukteshwar, Nainitalw.e.f 8-10 November, 2012.

Dr R. K. Singh, awarded **Tata Innovation Fellowship** (2012-2013) by Department of Biotechnology, Government of India, New Delhi, on account of his scientific achievements in the field of Animal Biotechnology. Dr Singh has been awarded a research project under this fellowship entitled *"Thermostabilization of recombinant protein antigens in diagnostic assays/kits using Heavy Water"*

Best poster award: Barnela, M., Manuja, A., Saini, R., Kaur, H., Kumar, S., Chopra, M., Yadav, SC, Kumar, R., Kumar, BK, Dilbaghi, N. 2012. Drug-Loaded chitosan nanoparticles for sustained delivery of trypanocidal drug for use in animals. In: AICTE sponsored International Conference *"On Current and Future Scenarios in Drug Development and Delivery"* at JCDM College of pharmacy, Sirsa, Haryana, August 11-12, 2012.

Training & Education:

Sanjay Kumar and Rajender Kumar attended two weeks training at National Research Centre for Protozoan Diseases, Obihiro, Hokkaido, Japan under OIE Twinning Project on Equine Piroplasmosis. During training they learned the technique of lateral flow assay and prepared about 200 strips. Experiments on qPCR for *T. equi* were also performed and parasitic load was assessed in DNA samples.

Dr Rajender Kumar and Dr Sanjay Kumar, completed one year Post-Graduate Diploma in Technology Management in Agriculture (PGDTMA) with distinction, jointly awarded by National Academy of Agricultural Research and Management (NAARM), and University of Hyderabad (UoH), Hyderabad under Centre for Distance and Virtual Learning.

Patents:

Anju Manuja, Neeraj Dilbaghi, Sandeep Kumar, Harmanmeet Kaur, Gaurav Bhanjana, Rajender Kumar, Balvinder Kumar and S.C. Yadav. Nano-drug delivery for quinapyraminesulphate. Application, No.2560/DEL/2011, dated 06.09.2011. (NRCE, Hisar and GJUS &T, Hisar).

Sanjay Kumar, Rajender Kumar, A. K. Gupta, S. C. Yadav. A highly sensitive kit for detection of antibodies against *Theileriaequi* in serum of equids. Application No. 2763/DEL/2012 dated 06.09.2012.

Visits Abroad:

Dr Praveen Malik attended the *'OIE Regional Conference on Glanders'* at Dubai (UAE), April 23-25, 2012.

Dr R. K. Singh attended the *"Info Day and Brokerage Event Call FP7-KBBE-7-2013"* at Brussel, Belgium, July 15-19, 2012.

Dr R. K. Singh attended *"Global PPRV Research Alliance"*, meeting in London,on March 8-11, 2012.

Tips for Colic Management in Equines

Colic is common condition and can affect horse of any breed or age. Colic is a symptom and not a disease; it simply means pain within the abdominal cavity. Colic is potentially life threatening and should be treated as an emergency in all instances.

The Clinical Signs: depend largely on the severity and type of the colic. It include - continuously getting down to roll and then getting back up again; pawing the ground; pacing the stable; limited or no passage of faeces or urine; straining to excrete faeces; turning round and looking at their flanks; kicking at their abdomen; sweating; abnormal temperature, respiratory rate and heart rate; anxiousness and shivering.

Treatment: All cases of colic must be treated as an emergency and veterinary advice should be sought immediately when colic is suspected. Treatment will vary depending on the type and severity of the colic. Pain relief medicines are often administered to help to alleviate the horse's discomfort. More serious cases such as strangulating colic (twisted gut) usually do not respond to medication and may be referred for colic surgery.

Prevention measures: Colic is more a manage-mental problem. However, there are plenty of simple steps that can be taken to greatly reduce the likelihood of a horse coming down with colic - provide moderate exercise and grazing (as much as possible) deworm horse at regular interval; always provide good quality roughages and fresh clean water; do not provide water immediately after exercise and after feeding; grain should be soaked/ semi boiled before offering it for feeding; avoid drastic change in feed and exercise, maintain dry: green fodder ratio to the tune of 2:1; call a veterinary doctor, if any abnormal signs are noticed.

National Research Centre on Equines
राष्ट्रीय अश्व अनुसंधान केन्द्र

रा.अ.अनु.के. समाचार पत्रिका

www.nrce.gov.in

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From Director's Desk

It is a matter of pleasure to forward the NRCE Newsletter 2012. This newsletter is presented as a comprehensive treatise highlighting the significant achievements of NRCE during the year to provide a holistic view of premier equine research centre in the country. At NRCE, our focus is on major problems confronting equine health and production. Our efforts during the recent years have been concentrated on generation of indigenous and cost-effective technologies for diagnosis, prevention and control of major equine diseases. As a result of these initiatives, we have developed diagnostics and vaccines for some of the major ailments affecting indigenous equines. Recently a vaccine was developed by the centre for controlling abortion in mares due to EHV-1 infection.

NRCE scientists regularly visit different states under our nationwide equine disease surveillance programme to attend disease outbreak to help equine owners in safeguarding their equine through timely diagnosis and management equine diseases. Recently (September 2012) an EIA case in a thoroughbred horse near Manesar (Haryana) was reported. Detection of EIA positive equines in India along with incidence of EIA in Asian countries is of great concern in view of the absence of the disease in the region for quite a long period. Therefore, rigorous surveillance and monitoring programme by NRCE and co-operation from State Animal Husbandry and private sector are sought for control of EIA in India.

During the period under report A Memorandum of Agreement (MoA) for technology transfer and commercialization of technologies has been signed between NRDC and NRCE for management, development, promotion and commercial exploitation of technologies developed by NRCE in complementary mode, so as, the technologies should reach to the stakeholders. International Workshop on "*Molecular Diagnosis of Equine Piroplasmosis*" was organized at NRCE for SAARC countries participants under OIE Twinning Laboratory Program on Equine Piroplasmosis from November 29 to December 8, 2012. This workshop was attended by one participant each from Afghanistan, Nepal, Bhutan, Bangladesh and Sri Lanka, and seven participants from state animal husbandry departments in India.

A total no. of 15 Equine health camps and *Kisan Goshthis* were organized in different states animals were examined for various ailments by the experts from NRCE. Basic treatment was provided to diseased animals and free medicines and mineral mixture was provided to equine owners. During interactive meet of equine owners and *Kisan Goshthis*, the equine owners were made aware about health, production and management of equines. NRCE also participated in eight exhibitions and animal fairs where different technologies developed at NRCE and information on equine husbandry and management were displayed for benefit of equine owners.

I sincerely hope that this publication would serve as a source of valuable information to the professionals of the Scientific/Academic Institutions, equine breeders and stakeholders in the country. We are thankful to Dr S Ayyappan, DG, ICAR and Secretary DARE, Dr K.M.L. Pahtak, DDG (AS) and Dr Gaya Prasad, ADG (AS) for their invaluable guidance and support. NRCE is committed to fulfil its mandate with concerted efforts of its scientific, technical, supporting and administrative staff members. The publication committee deserves appreciation for their efforts in printing of this newsletter.

(R. K. Singh)

NRCE

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