



भाकृअनुप-रापअनुसंब्युरो

समाचार-पत्र
(अक्टूबर २०१७ से मार्च २०१८)



ICAR-NBAGR Newsletter

October 2017 to March 2018

ISO: 9001-2008 Certified

अंक १४ न. २

DEDICATED TO ANIMAL GENETIC RESOURCES OF INDIA

Vol - 14 No. 2



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Until one has loved an animal,
a part of one's soul remains
unawakened....

Anatole France

From Director's Desk...

Dear Friends

I wish to thank you for showing interest in activities of ICAR-NBAGR, Karnal.

NBAGR is on a fascinating path of growth and development, which is evident from its recognition at national and international level. It is the sole institute of the country catering to identification, characterization, evaluation, conservation and registration of vast livestock and poultry diversity that India possesses. With very congenial and professional environment, our scientists are striving to make meaningful contribution to the mandate of the Bureau. NBAGR being the nodal agency for registration of livestock and poultry diversity of the country has successfully registered 169 breeds so far. But, we are aware that we still have a long way to go.

Our strong group of scientists have expanded their research to the most recent domains of phenomics, genomics and cell biology. In the last six months, phenotypic characterization of Manda buffalo of Odisha, non-described cattle population of Kerala and Tamil Nadu, Bidri and Nandidurga goats of Karnataka and indigenous yak of Ladakh was carried out through field surveys. In addition, attempts were made to identify candidate genes and pathways underlying meat quality in Bandur sheep and endurance trait in high altitude adapted Zanskar ponies. A significant achievement during this period was generation of Manipuri horse and Kutchi camel fibroblast cell lines for *ex situ* conservation. We continued our endeavor to strengthen our Gene Bank by adding semen doses from Dangi, Rathi, Khillar and Nagori cattle breeds.

Human resource development is an integral part of our mandate that is reflected through different training programmes organized at NBAGR. Bureau has successfully expanded its outreach to the grass root level by training field veterinarians and officials of animal husbandry departments. Our mission of being the companion of our farmers and livestock keepers is fulfilled through active participation in extension activities such as Mera Gaon Mera Gaurav.

I wish to congratulate my scientists for publishing their research papers in national and international journals. It is always a pleasure to receive words of encouragement and appreciation from distinguished personalities and visitors who come to NBAGR. During this period also distinct personalities from the country visited the Bureau and interacted with scientists. I am sure, with the active cooperation of all our stakeholders, scientists, staff, employees, collaborators, non-governmental organizations, media and farmers at large, we will be able to justify the motto of NBAGR, "Dedicated to Animal Genetic Resources of India".

I hope you enjoy reading the current issue of NBAGR's Newsletter. Suggestions for improvement may be sent at director.nbagr@icar.gov.in

Jai Hind!



(Arjava Sharma)

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SECTORAL NEWS

Livestock solutions for climate change

Livestock are an essential part of climate action on the ground in the agricultural sectors. Ninety-two developing countries have included livestock in their Nationally Determined Contributions (NDCs). More needs to be done as the livestock sector is growing rapidly. Livestock contribute 34% of global protein for human nutrition. But their contribution to food security and nutrition goes beyond this figure. They provide a diversity of essential micronutrients and many goods and services that are critical to livelihood of pastoralists and the majority of smallholders. Hundreds of millions of vulnerable people rely on livestock to cope with climate change. Emissions from livestock production can be substantially reduced by:

- » Improving efficiency in natural resource use to reduce emission intensity
- » Increasing soil carbon in pastures and biomass by improving grazing management
- » Reducing emissions by better integrating livestock into the circular (bio-) economy (e.g. by-products and wastes)



RESEARCH ACCOMPLISHMENTS

Characterization of Manda buffalo of Odisha

Manda buffaloes are distributed in the Koraput district of Odisha. Buffaloes surveyed in this region have phenotypic variability from other Odisha buffaloes and have uniform physical characters. Information on 18 body biometric traits of 69 adult male and female Manda buffaloes has been recorded. During survey, it was observed that Manda buffaloes are uniformly small with compact body. Horns are long and heavy which seems typical to the population. Body colour is light blackish brown. Animals are hardy and mainly maintained by farmers for draught purpose and also to some extent for milk and dung. Milk yield in Manda buffaloes is low ranging between 2-4 kg per

day with an average of 2.5 kg. Animals are maintained on extensive system of management and are purely dependent on grazing and dry fodder. Age at first calving is invariably 4 years with a calving interval of 1.5-2.5 years. On an average, a bullock pair has the capability of ploughing around 1 acre of land in a day. It serves as an excellent draught animal for ploughing small fields of hard red laterite soil of this area. Their draught capacity for transportation is 10 quintal/day and up to 8-10 km without showing any signs of stress. A pair of bullocks is sold at a price of Rs. 30,000 to 50,000 and serves as a source of income to the farmers. The herd size varies from 5-20 adult buffaloes with an average of 8 animals per



Typical male, female and herd of Manda buffaloes

family. Total estimated buffalo population in Koraput district is around 20,000, out of which 80-90% are Manda type. Considering current scenario, the population deserves to be recognized and registered as a separate breed.

(Contributed by Dr R S Kataria)

Characterization of non-described cattle population of Kerala and Tamil Nadu

One survey visit was conducted in the breeding tract for Alambadi cattle population, in the hamlets of Dharmapuri and Krishnagiri district of Tamil Nadu and Alambadi hamlet of Kollegal taluk in Karnataka. Alambadi animals are medium in size with grey to dark grey and iron grey coat colors and are maintained on semi-intensive system of rearing. The horns are straight, turn backward, forward and upward. The base of the horn is broad and becomes sharp towards the tip. There are white patches above and around the eyes and also, in the brisket region and dewlap region. Herd size ranges from 3 to 20 animals. Animals are allowed to graze in the forest during the day time, fed with dry fodder during summer/lean season and are very aggressive to handle. Only natural mating is practiced and bulls are selected based on the phenotypic characters and draft power. Milk yield is low (1.0 to 1.5 litres per day). Majority of animals are maintained for sale of dung and male calves. If trained properly, the bullock pair can work for 7-8 hours in a day. Proper taming is required for utilizing animals for ploughing and cart pulling.



Alambadi cattle

(Contributed by Dr K N Raja)

Characterization of Bidri and Nandidurga goats of Karnataka

Nandidurga goats are distributed in Chitradurga, Tumkur and Davangere districts of Karnataka. Total goat population of breeding tract is 6.6 lakhs. Estimated population of Nandidurga goat is 1,78,000. Average flock size is 29.6 (12-93). Flocks are stationary. Goats are housed in kutcha sheds during night and are raised only on grazing. Coat colour is white and eyelids are brown or black. Ears are leafy and pendulous. Milking is not done as these goats are reared for meat. Twinning is common. Adult weight varies from 30 to 50 kg in males and 26 to 40 kg in females.



Nandidurga goat

Bidri goats are distributed in Bidar and Kalaburagi districts of Karnataka. There is uniformity and purity within Bidri population. Total goat population



Bidri goat

of breeding tract is 5.2 lakh and estimated Bidri population is 1,10,000. Average flock size is 74.3 (21-130). Flocks are stationary. Housing is in kutcha open sheds during night. Coat colour is black, muzzle,

eyelids and hooves are black. Ears are pendulous. Goats are reared for meat only. Adult weight varies from 31 to 47 kg in males and 24 to 40 kg in females and twinning is commonly observed.

Table 1. Body measurements (cm) and adult weight (kg)

| Parameter/ population | Nandidurga Goat | | | | Bidri Goat | | | |
|--------------------------|-----------------|-------|--------------|-------|------------|-------|-------------|-------|
| | Male (46) | | Female (172) | | Male (20) | | Female (43) | |
| | Average | Range | Average | Range | Average | Range | Average | Range |
| Chest girth | 81.47±2.40 | 70-98 | 75.07±1.02 | 61-90 | 80.75±2.12 | 68-89 | 77.12±0.69 | 64-87 |
| Body length | 59.65±1.56 | 48-69 | 55.31±0.87 | 44-63 | 58.17±1.46 | 52-71 | 56.09±0.63 | 47-70 |
| Height at withers | 79.40±1.83 | 72-95 | 71.92±0.72 | 62-82 | 79.25±1.79 | 72-89 | 74.84±0.66 | 64-83 |
| Horn size | 20.33±1.54 | 11-30 | 15.79±0.73 | 7-23 | 16.44±1.85 | 9-26 | 13.72±0.67 | 6-20 |
| Ear length | 16.36±0.41 | 13-19 | 15.38±0.29 | 12-20 | 16.25±0.37 | 15-18 | 16.28±0.22 | 12-19 |
| Tail length | 21.29±0.91 | 13-26 | 18.90±0.43 | 17-29 | 17.17±0.65 | 14-21 | 16.70±0.46 | 11-23 |
| Adult weight | 38.92±2.95 | 26-56 | 30.11±1.03 | 24-41 | 36.78±2.76 | 23-52 | 32.36±0.90 | 19-45 |

(Contributed by Dr M S Tantia)

Characterization of indigenous yak of Ladakh

Breed surveys were conducted in Nubra and Sham valleys of Ladakh to characterize local yak populations in their native tract. Yaks in Nubra and other regions of Ladakh are reared by Buddhist community for milk, meat, manure, hair-fibre and transport purposes. Yaks of Nubra are medium in size. Coat colour is mainly dark brown to black with glossy sheen. Skin, muzzle, eyelids, tail switch are black, horns are grey to black. Forehead and nasal bone are straight. Dorsal ridge is prominent in males. Limbs are small and cylindrical. Horns are curved and placed laterally upward and backward with pointing tip. Ears are small and horizontal. Flank, lower belly and thigh regions are covered with long hair. Averages of height at wither, body length, heart girth and paunch girth



Male Yak



Female Yak

were 112.1, 117.1, 160.9 and 161.4 cm in adult males (38) and 101.6, 107.1, 147.5 and 146.6 cm in adult females (62), respectively. Male and female attain sexual maturity at 3 years of age. Female starts calving at about 4 years of age and calves alternate year, producing 7-8 calves in life time. Males are castrated at the age of 7-8 years after completing about 4 years of breeding. Major breeding period is during July-August. Milk production is 0.5 to 1.0 Kg/day. Lactation period ranges from 6 to 8 months. Herd size is 6 to 30. Most of the yaks migrate towards high land pastures in April and remain there up to October/November. Cross-hybrids of yak are being largely preferred over yak in most of lower altitudes of Ladakh, particularly due to higher milk and more resilience to lower altitude climate.

(Contributed by Dr S K Niranjan)

Identification of candidate genes and pathways underlying meat quality in Bandur sheep

Bandur, an indigenous sheep breed from Mandya district of Karnataka is famous for its mutton, which fetches a higher price than mutton from local sheep. Meat quality is not only affected by feed, post mortem processing, fat percentage etc., but also by genetic factors. To identify the genetic factors underlying the mutton quality of Bandur sheep, gene expression profiling of skeletal muscles of Bandur sheep was carried out using RNA sequencing technique. Purified mRNA from four biological samples of skeletal muscles from Bandur sheep

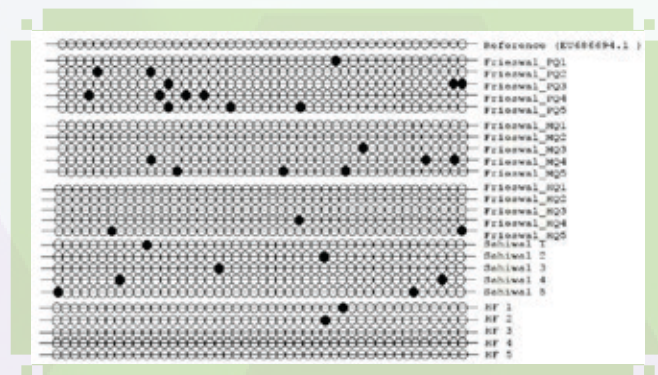
were subjected to paired end sequencing on Illumina HiSeq-2000 Platform. The total number of reads for each library ranged from 24,280,035 to 30,330,120 with GC content of 44-50%. The reads were aligned to the reference assembly genome Oar v3.1. Gene expression levels were evaluated by counting the number of Fragments per Kilobase of transcript per Million mapped reads (FPKM). The significant GO terms ($p < 0.05$) corresponded to skeletal muscle cell differentiation, AMPK signaling pathway, sequestering of actin monomers, mRNA transcription, brown fat cell differentiation and adiponectin-activated signaling pathway. As expected, 99 GO terms were related to muscle or protein and fat metabolism. Genes previously associated with fatty acid metabolism and tenderness that were identified in this study include *FABP4*, *ADIPOQ*, *ADIPOR2*, *LPIN1*, *HspB1*, *DNAJ5*, *HspA6*, *CRYAB*. Pathways for general housekeeping functions like RNA transport and degradation, Toll-like receptor signaling pathway, immune system, glycolysis etc, were identified. Certain pathways and genes associated with actin and cytoskeleton were also identified. Other prominent pathways detected that are relevant to meat quality were AMPK signaling pathway, PPAR signaling pathway, calcium signaling pathway, adipocytokine signaling pathway, lipid metabolism, muscle development and differentiation. The identified genes and pathways will form interesting candidates for further research on meat quality in Indian sheep.

(Contributed by Dr Reena Arora)

Elucidation of promoter methylation status of *DAZL* gene in bulls with varying semen motility

Epigenetic modifications (DNA methylation, histone modifications, chromatin remodelling) are regarded as key players influencing gene expression. *DAZL* gene plays an important role in germline development and gametogenesis. The methylation and mRNA expression level of this gene have been significantly negatively correlated in the testes of cattle-yaks hybrids and their parents. The methylation profile of *DAZL* gene promoter in bull spermatozoa was analyzed in an attempt to speculate its role in crossbred cattle subfertility. Semen samples from Sahiwal, Holstein Friesian and Frieswal bulls (Sahiwal X Holstein Friesian) with varying semen motility parameters were collected and DNA was isolated. Methylation specific primers were used to amplify part of promoter and

exon 1 of *DAZL* gene using bisulfite converted DNA. The amplified products were sequenced after cloning in pTZ57R/T vector. Sequence analysis revealed significantly higher DNA methylation of *DAZL* gene in Frieswal bulls with poor motility (28.26%) as compared to medium (15.21%) and high motility phenotype (6.52%). In purebred counterparts, Sahiwal and Holstein Friesian, epigenetic marks were more in the former (15.21%) than the latter (4.34%) but in both cases, the values were lower as compared to the poor motility Frieswal bulls. This suggests that differential hypermethylation of the CpG islands could possibly influence reproductive parameters in bovines.

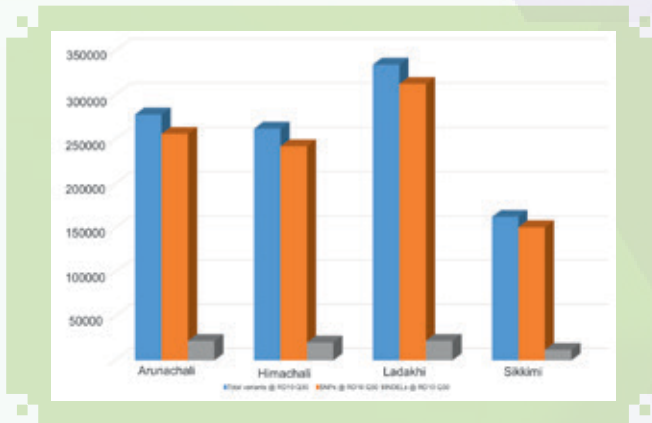


Position of methylated CpG sites in different groups (PQ: Poor motility, MQ: Medium motility, GQ: Good motility, HF: Holstein Friesian)

(Contributed by Dr Sonika Ahlawat)

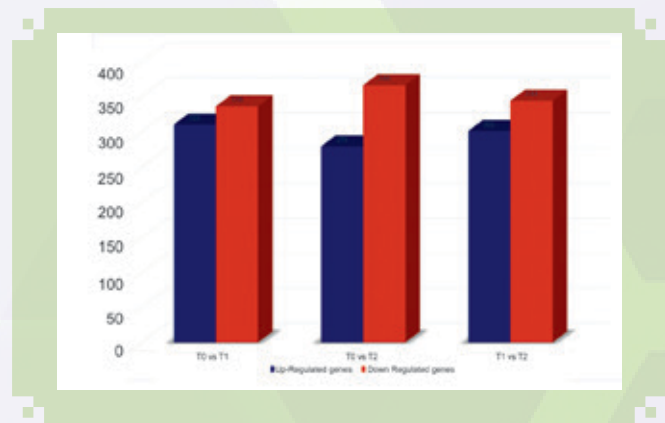
Genome wide diversity analysis of Indian Yak populations

A total of 80 samples of Indian yaks belonging to Arunachali, Himachali, Ladakhi and Sikkimi yak were used for the identification of genome wide SNPs and INDELS using Illumina TrueSeq chemistry on Illumina HiSeq 2000 platform. The number of SNPs genotyped in Arunachali, Himachali, Ladakhi and Sikkimi yaks at RD 10 were 1,04,188, 67,032, 49,665 and 33,782, respectively. Overall, a total of 5,79,575 high quality SNPs along with 50,319 INDELS were identified with a coverage of 9.42% in the Indian yaks. Corresponding values for observed and expected heterozygosity were 0.3362 and 0.2981; 0.3435 and 0.2992; 0.3136 and 0.3073; 0.2831 and 0.2817, respectively. The F_{is} value was 0 in case of Arunachali and Himachali yaks, whereas it was found to be 0.022 in Ladakhi and 0.015 in Sikkimi yaks. The genetic distance based on genome wide SNPs in the Indian yaks revealed that Ladakhi and Sikkimi yak populations are distinct.



Variants @ RD10 Q30

(Contributed by Dr Jayakumar S)

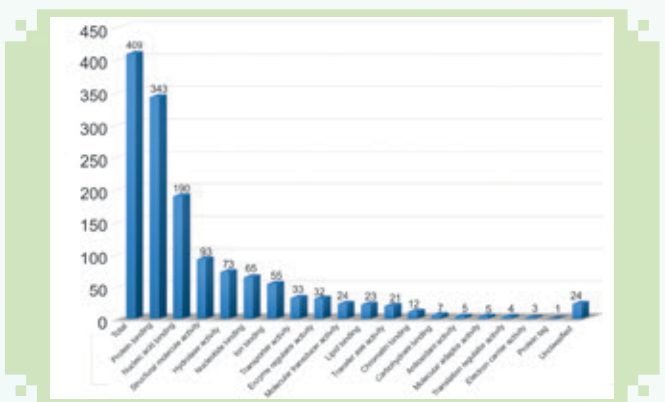


Up-regulated and down-regulated differentially expressed genes (DEGs) in Zanskar ponies under endurance trial (T0: Before exercise, T1: immediately after trial; T2: 2hr post-trial)

Transcriptome analysis of Zanskar PBMCs during endurance exercise at high altitude

RNA seq based transcriptome data of 9 PBMCs samples (3 each from pre-exercise (T0), post-exercise (T1) and post recovery period (T2) groups) was generated to identify the genes up-or down-regulated before and after endurance exercise at high altitude. A total of 646 genes were found to be differentially expressed in Zanskar ponies before trial (T0) and after endurance exercise trial (T1) and 2hr post-trial (T2). Ribosomal protein such as S21 (*RPS21*), S15A (*RPS15A*), S28 (*RPS28*), S13 (*RPS13*), S6 (*RPS6*), S24 (*RPS24*), L37 (*RPL37*), L35A (*RPL35A*), L34 (*RPL34*), L27A (*RPL27A*), L35 (*RPL35*), L23 (*RPL23*), L31 (*RPL31*) and L5 (*RPL5*) genes were among the top up-regulated genes. Beta-2-Microglobulin (B2M), an immune related gene involved in the presentation of peptide antigens to the immune system also showed an increased expression in T1 and T2 group in comparison to T0 group. Several immune related genes such as *CXCL16*, *CCL5*, *DQA*, *DRB*, *MHC3*, TNF receptor superfamily member 1B (*TNFRSF1B*), cathepsin W (*CTSW*), cathepsin S (*CTSS*), Integrin alpha L (*ITGAL*) were also found to be up-regulated in animals after trial. Increased expression of chemokines such as chemokine (C-X-C motif) ligand16 (*CXCL16*; *FPKM T1: 116.349*) and C-C Motif Chemokine Ligand 5 (*CCL5*; *FPKM T2:3604*) after trial treatment indicated strong inflammatory response in horses during stress conditions. These chemokines actively participate in cell cycle regulation and induce strong immune response. Data suggested significant induction of hypoxia inducible factor 1A (*HIF-1A*). The anti-inflammatory superoxide dismutase 1 (*SOD1*) also showed increased expression in T1 and T2 groups after exercise.

The up-regulated genes in Zanskar ponies were classified in terms of most significant biological processes and molecular functions enriched in the data set. Top biological processes were metabolic process (311 genes), biological regulation (276 genes), localization (244 genes), response to stimulus (216 genes), unicellular organismal process (164 genes), multi-organism process (159 genes), cell communication (157 genes), and cell proliferation (65 genes). Similarly, major molecular functions identified were; protein binding (343 genes), nucleic acid binding (190 genes), structural molecule activity (93 genes), hydrolase activity (73 genes), nucleotide binding (65 genes), ion binding (55 genes), transporter activity (33 genes), enzyme regulator activity (32 genes), molecular transducer activity (24 genes), lipid binding (23 genes), and transferase activity (21 genes). Some of the important molecular pathways impacted were glucagon signaling pathway, NF-kappa B signaling pathway, B cell receptor signaling pathway, ribosome, antigen processing and presentation, natural killer cell mediated cytotoxicity, RNA transport and protein export.



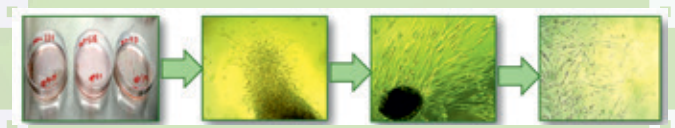
Top Ontology terms for molecular functions

(Contributed by Dr Manishi Mukesh)

Generation of Manipuri horse and Kutchi camel fibroblast cell lines

Ear marginal tissues from 8 Manipuri horses and 6 Kutchi camels were utilized for establishment of cell lines by attachment cell culture method followed by cell cryopreservation technique. Primary culture was established using explant culture technique using fibroblast specific media. At about 10-14 days, epithelial-like and fibroblast-like cells could be seen sprouting from the margins of explants of both Manipuri horse and Kutchi camel. Fibroblast-like cells showed typical fusiform morphology with centrally located oval nuclei. Initially epithelial and fibroblast cells grew together but during subsequent passages, fibroblast cells grew rapidly and replaced the epithelial cells. Passaging of cell lines for both Manipuri horse and Kutchi camel was continued. The growth curve at passage-5 represented typically S-shaped as the cell population passed through a lag phase, a logarithmic phase and a plateau phase with population doubling time of 27.9 hrs and 31.37 hrs and multiplication rate of 0.86 population doubling/24 hrs and 0.76 population doubling/24 hrs for Manipuri horse and Kutchi camel, respectively.

The cells were cryopreserved from 3rd to 6th passage stocking at least 75 cryogenically-preserved vials (1×10^6 cells/ml) per animal. These newly established cell lines of Manipuri horse and Kutchi camel preserves the genetic resources at the cellular level and provides invaluable materials for genomic, post-genomic and somatic cell cloning research.



Outgrowth of primary fibroblast cells from skin explants

(Contributed by Dr Rekha Sharma)

National Gene Bank

Germplasm repository at NBAGR is being strengthened by preserving diversified form of germplasm (semen, embryos, DNA, epididymal sperms and somatic cells). During the reported period, a total of 19,475 semen doses from 4 cattle breeds (Dangi, Rathi, Khillar and Nagori) were added to Gene Bank for long term cryopreservation.

(Contributed by Dr RAK Aggarwal)

PUBLICATIONS

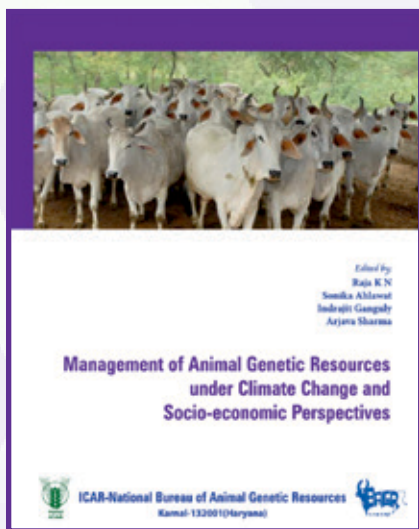
Research Publications

1. Behl JD, Sharma A, Kataria RS, Verma NK, Kimothi SP, Bhatia AK and Behl R (2017). Characterization of genetic polymorphism in Toll like receptor 9 gene in *Bos indicus* Sahiwal cattle. *Indian Journal of Animal Science* 87(11):1362-1366.
2. Behl R, Niranjana SK, Behl J and Vihj RK (2017). Comparison of three types of Indian donkey populations based on morphometric characteristics. *Journal of Livestock Biodiversity* 7(1):17-21.
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12. Niranjana SK, Kataria RS, Sodhi M, Bharti VK, Kumar B, Garg A, Yadav MC, Sharma A, Vivek P, Giri A and Mukesh M (2018). Evaluation of physiological parameters in response to endurance exercise of Zanskar ponies adapted to high altitude of Ladakh region. *Defence Life Science Journal* 3(2):172-176.
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Book

Management of Animal Genetic Resource under climate change and socio-economic perspectives edited by Dr. K.N. Raja, Dr Sonika Ahlawat, Dr. Indrajit Ganguly and Dr. Arjava Sharma (ISBN: 978-93-83537-38-9).



Bulletins/Monographs

Technical bulletin on "Ladakhi Cattle: A Unique Animal Genetic Resource Adapted to High Altitude of Leh-Ladakh by Manishi Mukesh, Monika Sodhi, RS Kataria, Saket K Niranjana, RK Pundir, Preeti Verma, Ankita Sharma, Parvesh Kumari, Shelesh Kumar Swami, Arjava Sharma (ICAR-NBAGR, Karnal), Vijay K Bharti, Arup Giri, Prabhat Kumar, Sahil Kalia, Deepak Gogoi, Sarangi Prabhu, Bhuvnesh Kumar (DRDO- DIHAR, Leh, Jammu and Kashmir), M Iqbal, Stanzin Rabgais, Shakil Ahmad (State Animal Husbandry Department, Leh, Jammu and Kashmir)

लद्दाखी गाय: लद्दाख की एक अनमोल गौ-सम्पदाभा: मनीषी मुकेश, मोनिका सोदी, साकेत के निरंजन, आर एस कटारिया, आर के पुंडीर, प्रीती वर्मा, अंकिता शर्मा, परवेश कुमारी, शेलेश कुमार स्वामी, आर्जव शर्मा (राष्ट्रीय पशु अनुवांशिक संसाधन ब्यूरो), विजय के भारती, अरूप गिरी, प्रभात कुमार, साहिल कालिया, दीपक गोगोई, भुवनेश कुमार (डी.आर.डी.ओ.-रक्षा उच्चतुंगता अनुसंधान संस्थान, लेह, जम्मू और कश्मीर), एम इकबाल, एस राबगैस, शकील अहमद (राज्य पशु पालन विभाग, लेह, जम्मू और कश्मीर)

Awards and recognitions

1. Best oral presentation award to Dr Reena Arora for the paper entitled "Exploring the muscle transcriptome of Bandur sheep using RNA sequencing" presented in National seminar on Small ruminants: National scope on upscaling production to products value addition and their safety at ICAR-CIRG, Makhdoom (9-10th November, 2017).

2. Best oral presentation award to Dr Rekha Sharma for the paper entitled "Comparative milk metabolite profiling for exploring superiority of indigenous cow milk over exotic and crossbred counterparts" by Rekha Sharma, Sonika Ahlawat, RAK Aggarwal, Ajit Dua and MS Tantia, presented in National Symposium on "Sustainable management of livestock and poultry diversity for enhancing the farmers income" at RAJUVAS, Bikaner (8-10th February, 2018).
3. Prof KN Sharma Memorial award for best research article entitled "Analysis of sequence variability and expression pattern of lactoferrin gene in Sahiwal cows (*Bos indicus*) and Murrah buffaloes (*Bubalus bubalis*) by Sharma A, Swami SK, Kumar M, Sodhi M, Kataria RS, Jain P, Bhatia AK, Mohanty AK, Niranjana SK, Shandilya UK, Kumari P and Mukesh M published in Journal of Livestock Biodiversity 2017.
4. Young Scientist Award to Ravinder Singh for his presentation entitled "STR markers and mitochondrial D-loop sequence based genetic diversity analysis indicates unique population structure among buffaloes of Odisha state" in National Symposium on "Sustainable management of livestock and poultry diversity for enhancing the farmers income" at RAJUVAS, Bikaner (8-10th February, 2018).
5. Best poster award to poster entitled "Characterization and evaluation of milk colostrum derived lactoferrin of Sahiwal cows for its anti-cancerous potential by Sharma A, Sodhi M, Mohanty A, Shandilya UK, Kataria RS, Singh MK, Jain P, Niranjana SK, Bhatia AK, Kumar P, Swami SK, Mukesh M in National Symposium on "Sustainable management of livestock and poultry diversity for enhancing the farmers income" at RAJUVAS, Bikaner (8-10th February, 2018).
6. Second best poster award to the poster entitled "My vision-corruption free India" by Himani Sharma, Mandeep Kaur, Reena Arora and Rekha Sharma during Vigilance awareness week (30th October - 4th November, 2017) at ICAR-NBAGR, Karnal
7. Dr. Avnish Kumar, Principal Scientist presented an invited lecture on the topic "Application of information technology in field survey and dairy buffalo recording system" in the International Conference on Carabao Based Enterprise Development, October 26-27, 2017 at Philippines Carabao Center, Nueva Ecija, Philippines.

OTHER ACTIVITIES

Seminars/Symposium/ Trainings organized

- » National Symposium on “Sustainable Management of Livestock and Poultry Diversity for enhancing the Farmers’ income” was organized by Society for Conservation of Domestic Animal Biodiversity (SOCDAB) in collaboration with College of Veterinary & Animal Science, Rajasthan University of Veterinary & Animal Sciences, Bikaner (Rajasthan) from 8th-10th February, 2018. Deliberations, discussions and presentations were made on various issues viz., management of livestock and poultry diversity (characterization, evaluation, inventorization, conservation), improvement of animal resources for enhancing livestock productivity (genomic selection, reproductive tools), sustainable utilization for indigenous animal genetic resources (value addition, marketing, social, cultural, ecological issues) and enhancing farmers income.
- » ICAR sponsored Short Course on “*In situ* Conservation of Indigenous Livestock and Poultry Breeds” from 25th October to 3rd November, 2017 for Assistant Professors and above of ICAR, SAUs and SVUs. Dr Arjava Sharma, Director, ICAR-NBAGR was the Course Director and Dr SK Niranjana and Dr Jayakumar S were course coordinators. Sixteen participants belonging to 12 different states attended the training.
- » Model Training Course on ‘Strategies for Conservation of Indigenous Animal Genetic Resources under Climate Change and Socio-economic Perspectives’ was organized from 23rd to 30th November, 2017 for officers of SAHD, SLDB/agencies and State Biodiversity Board. It was funded by Training Unit, Department of Extension, Ministry of Agriculture & Farmer’s Welfare, Government of India. Twenty seven veterinary officers from 12 states attended the course.



Inauguration of National symposium at Bikaner, Rajasthan



Dr. Gurdial Singh, Vice-Chancellor, LUVAS, Hisar inaugurating the program



Participants with Director and faculty of NBAGR

Dr. Gurdial Singh, Vice-Chancellor, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar (Haryana) inaugurated the programme and Dr N Yuvaraj, IAS, PS to Vice President of India, addressed the participants and distributed the certificates during valedictory function.

Trainings undergone by Technical staff

Technical officers, Sh. Naresh Kumar and Sh. Rakesh Kumar of Animal Biotechnology Division underwent a training programme on “Proficiency enhancement for working in biochemistry & biotechnology laboratory” during 14th -16th December, 2017 at ICAR- IIVBR, Karnal.

CELEBRATIONS

Republic Day

Staff and families of the Bureau celebrated 69th Republic Day on 26th January, 2018 with fervour and enthusiasm. The function was presided over by Director, Dr. Arjava Sharma. National Anthem was played after unfurling of the tricolour. Children



Glimpses of Republic day celebrations at NBAGR

participated in quiz and cultural program with enthusiasm and excitement.

Agricultural Education Day

Agricultural Education Day was celebrated at the Bureau on 3rd December, 2017. The purpose of this programme was to generate awareness among the students about the career opportunities that exist in the agricultural sector. It was kept an open day for the students. The participating students (120) of five schools were briefed about the animal genetic resources of the country and the institute's research work. Dr Arjava Sharma, Director of the Bureau delivered a talk on "Livestock biodiversity and its role in national development". Students from all the schools enthusiastically participated in a quiz competition that was organized on this occasion. The teachers and students of the participating schools expressed their desire to be part of such celebrations in future as well.



Inquisitive students at NBAGR, Karnal

Extension activities

- » The Bureau continued its activity by participating in the ICAR programme *Mera Gaon Mera Gaurav*. Linkages with farmers and livestock keepers were strengthened through *this programme*. A team of scientists visited Dadupur, Shahjanpur, Bras, Sirsi, Chiaro and Badshahpur villages of Karnal and delivered lectures on various aspects of Animal Husbandry.



Scientists at farmers' door

- » An exhibition on Animal Genetic Resource of the country was organized during Dairy Mela on 23rd -25th November, 2017 at NDRI, Karnal.
- » AnGR exhibition was installed at 10th Livestock Championship, 2017 held at village Jhalan, Patiala, Punjab from 1st -5th December, 2017. About 2,000 persons visited the stall.
- » An exhibition was organised during the Kisan Mela held on 17th February, 2018 at Sugarcane Breeding Institute (Regional Centre) Karnal. About 100-110 persons visited the Bureau stall.
- » Krishi Unnati Mela was held from 16-18th March, 2018 at IARI Mela ground, New Delhi. The ICAR-NBAGR mobilized 16 progressive farmers from Barota village of Karnal to attend Prime Minister's address and visit of various stalls.
- » Bureau displayed an exhibition of farm animal genetic resources during Haryana's 3rd Agri-summit 2018 cum Kisan Mela held from 24th -26th March, 2018 at Rohtak (Haryana).



ICAR-NBAGR stall at exhibition attracting large crowds

Sports

ICAR zonal (North) sports meet 2017

A contingent of 22 staff members of ICAR-NBAGR participated in the ICAR zonal (North) sports meet 2017 held at ICAR-IISR, Lucknow from 30th October to 2nd November, 2017. The contingent participated in Basket Ball, Volley Ball (smashing & shooting), Kabaddi, Badminton, Table Tennis, Carrom Board, Chess and athletic events.



ICAR-NBAGR contingent led by flag bearer Mr Harvinder Singh

2. Sh. Raj Kumar joined as Administrative Officer, NBAGR, Karnal on 26.12.2017.
3. Sh. HR Arya was relieved from NBAGR on his promotion to the post of Senior Administrative Officer, ICAR- NDRI, Karnal on 27.12.2017.
4. Dr. Vikas Vohra was promoted to the next grade of Principal Scientist with effect from 02.04.2017.
5. Sh. Ashok Kumar, Technical Officer, superannuated on 31.03.2018.



Farewell to Sh. HR Arya and Sh. Ashok Kumar

DISTINGUISHED VISITORS

1. A Doordarshan Team from New Delhi visited on 24.10.2017.
2. Sh. R P Singh, Member, Governing Body, ICAR visited on 13.02.2018.



Director welcoming honorable Sh. RP Singh

3. Dr. Shiv Tripathi and Prof. N.R. Bhusnur Math from Management Development Institute visited on 03.03.2018.

APPOINTMENTS/PROMOTIONS/ TRANSFER

1. Sh. Yoginder joined the post of Assistant Section officer at Election commission of India, New Delhi on deputation from ICAR on 20.12.2017.

राजभाषा प्रकोष्ठ द्वारा आयोजित विभिन्न कार्यक्रम

संस्थान राजभाषा कार्यान्वयन समिति की बैठकें

संस्थान में राजभाषा कार्यान्वयन समिति की बैठकें निरंतर की जाती हैं। इन बैठकों में लिए गए निर्णयों पर क्रियान्वयन व अनुपालन किया जाता है। प्रत्येक



तिमाही में निष्पादित कार्यवाई पर चर्चा करके पुष्टि की जाती है। इस अवधि के दौरान दो बैठकें 19-01-2018 तथा 26-03-18 को आयोजित की गई हैं।

संस्थान में हिंदी व्याख्यान/कार्यशालाओं का आयोजन:

संस्थान में राजभाषा हिंदी के प्रचार-प्रसार तथा इसके दैनिक राजकीय कार्यों में अधिकाधिक प्रयोग को प्रगति देने हेतु हिंदी व्याख्यानों/कार्यशालाओं का आयोजन किया जाता है। इसी प्रक्रिया में एक हिंदी व्याख्यान 15-02-2018 को आयोजित किया गया जिसमें संस्थान के प्रधान वैज्ञानिक एवं प्रभारी नेटवर्क प्रोजेक्ट, डॉ. मधुसूदन टांटिया ने "समय प्रबंधन" विषय पर रोचक व ज्ञानवर्धक व्याख्यान प्रस्तुत किया।