



# ICAR - CSWRI

भा.कृ.प.अ.-केन्द्रीय भेड़ एवं ऊन अनुसंधान संस्थान, अविकानगर  
ICAR - CENTRAL SHEEP AND WOOL RESEARCH INSTITUTE, AVIKANAGAR  
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## NEWS LETTER



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### From the Director's Desk

Greetings to all.

Sheep rearing is a source of sustainable livelihood for the farmers in almost all the topographies of the country. The grazing land is a major source of feed and fodders for sheep in the country which is declining rapidly due to urbanization. On the other hand, the animal population is increasing and adding burden on already overstocked grazing lands.

In the present situation of climate change and degrading grazing resources, the importance of sheep as a future animal has increased because of better survivability and reproduction even in a harsh climate. Moreover, the demand for mutton is growing in the country, especially in the J&K and southern states. There is a need to shift from the traditional philosophy of "more sheep means more money" to "more money from less sheep" to resolve the issue of shrinking grazing lands and growing meat demand. The focus should be on more sheep per sheep for increasing the income of farmers through market oriented production system. It is a matter of great pleasure and honour for the staff of CSWRI that Hon'ble Shri Radha Mohan Singh Ji, Cabinet Agriculture and Farmer Welfare Minister, GOI, visited the institute on the occasion of National Sheep and Wool Fair on 29 September 2018. While addressing the farmers and scientists, he stressed upon the development of technology for doubling the farmer's income. Presently, the institute has developed Avi-razai, made from coarse wool, now research is being taken to make it cheaper and improve its comfort and thermal insulation properties. In areas of meat processing, mutton cookies are developed which can be kept at room temperature for three months. It is a good source of animal protein suitable for children as well as military people posted in very remote areas where regular supply of food is not possible. Swachh Bharat Abhiyan, Raj-Bhasha Week and Vigilance Week were celebrated in the institute during the last six months. I wish all the best for achieving fruitful research and development in sheep and wool sector during 2019. I extend good wishes to the entire stakeholders for a happy new year 2019.



(Arun Kumar Tomar)  
Director

## Research Highlights

### Avishaan sheep for doubling farmer's income

R.C. Sharma

Avishaan sheep with traits of multiple birth, higher litter weight, more milk per dam and adaptable to harsh climatic conditions has recently been developed at ICAR-CSWRI, Avikanagar through three breed crossing system in which *FecB* gene has been introgressed successfully. In recent years, ICAR-CSWRI has provided more than five hundred prolific animals possessing *FecB* gene to the shepherds and Government agencies of eight states viz. Rajasthan, Haryana, Maharashtra, Jharkhand, Telangana, Karnataka, J&K and Punjab for breeding purposes. Feedback received from clients belonging to different areas is encouraging in terms of multiple lambing to the tune of more than 55% at farmers' door.



### Feeding of khejri and pala leaves reduce methane emission in sheep

R. S. Bhatt

*Ailanthus excelsa* (ardu), *Ziziphus nummularia* (pala) and *Prosopis cineraria* (Khejri) are the major source of fodder to sheep and goats in arid and semi-arid region of India. These leaves were evaluated for their methane mitigation potential. Thirty six (36) finisher ram lambs fed on complete feed block containing 20% Khejri and Pala leaves and Ardu leaves in control group. Methane was estimated through sulfur hexafluoride tracer technique. *P. cineraria* and *Z. nummularia* leaves in diet reduced the methane production by 16% and 10.7% per unit of digestible nutrients and loss of energy (% of ME) by 2.6% and 1.5%, respectively. The study indicated that native trees/shrubs growing in arid/semi-arid region are not only supplying fodder to the small ruminants but also playing a vital role in reducing methane emission from animals.



### Characterization of melatonin receptor gene (MTNR1A) and identification of SNPs associated with seasonality in Indian sheep

Vijay Saxena

Sheep is a short-day seasonal breeder, it means its maximum reproductive activity is achieved when day length starts decreasing. Melatonin is an important hormone which is secreted by pineal gland in proportion to darkness and its effect is mediated by melatonin receptor subtypes, principally *MTNR1A*. Melatonin regulates the circadian rhythmic cycles and reproductive changes in seasonal reproductive animals. Gene has been characterized and single nucleotide polymorphism (SNPs) in *MTNR1A* gene has been identified in ten Indian sheep breeds across the country. The identified SNPs (C606T and G612A) are important markers, whose frequencies varies in seasonal and non-seasonal sheep breeds. It is found that prevalence of CC (C606T) and GG (G612A) very high (>90%) in sheep breeds of tropical arid regions (Magra, Marwari and Malpura), signifying their ability is very less affected by photoperiodic changes. Many novel SNPs (G675A, G706A, C893A, G931C) in *MTNR1A* gene of Indian sheep breeds are identified. G931C is identified to be the first conformational destabilizing SNPs in Chokla sheep breed of India. It led to substitution of alanine by proline in the seventh helical transmembrane domain. Thus, the identified markers especially (C606T and G612A) could be evaluated in larger field trials of genotyping animals for studying their role in out of season breeding of animals.



### Goat milk as nutraceutical and functional food

A. S. Meena

Demands for goats' milk and milk products are increasing considering due to its nutritional and medicinal values. The genetic variation of casein protein affects the milk functional and nutritional properties. Casein consists of 4 gene products and further divided into alpha S1-casein, beta-casein, alpha S2-casein and kappa-casein in farm animals. In present study, 6 parental unrelated Sirohi goat milk samples were collected and total RNA was isolated. The transcripts (mRNA) of all four casein gene(s) have been reverse transcribed; cloned in pJET1.2 vector and positive clones of casein genes were sequenced. Sequence analysis revealed variability in Sirohi goat casein genes with some novel variations, which are not reported earlier. At kappa casein gene (CSN3) nearly seven SNPs reported (all in transition mutation) in three animals coding region sequences. Out of seven SNPs in coding region, four SNPs are synonymous in nature. The polypeptide chain of





kappa casein protein found variation at glutamine, valine and serine replaced by arginine, isoleucine and proline amino acid, respectively. The four haplotypes pattern have been observed in analysed samples. The alpha S-2 casein gene, ten SNPs identified in three animals coding region sequences. These polymorphisms are transition and trans-version type mutation. The one insertion of adenine is also reported in one sequence of alpha S-2 casein gene.

### Mutton based cookies: Shelf stable and healthier product

Y.P. Gadekar

Meat has been the part of human diet since ancient time. It is nutrient dense food, providing protein, fat, vitamins and mineral. Available nutrients makes meat and meat products susceptible for microbial spoilage and human health hazard due to pathogens. In the tropical countries, problem is more aggravated due to frequent fluctuations in electricity as these perishable items require refrigeration/cold chain facility for storage. This creates demand for shelf stable meat products which could be stored at ambient temperature without any need of refrigeration. The meat based cookies have been developed.



Cookies are ready to eat, convenience product and shelf-stable up to 90 days at room temperature. It contained 26% protein and 528 Kcal/100g gross energy. The product is well accepted by the consumers. It could be healthier and suitable food for children and military personnel.

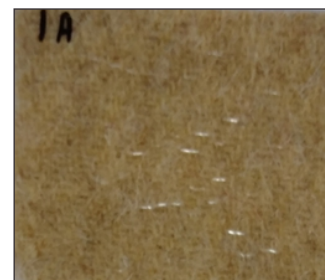
### Composites – A diversified industrial application of coarse wool

Vinod Kadam

The conversion of coarse wool into an industrial product will provide higher income to farmers. Composite has emerged as materials for the manufacturing of industrial products with high-performance. The use of natural fibres in composites has gained a remarkable momentum due to the sustainability, awareness and improvement in mechanical properties. However, a typical scale structure of wool and its poor affinity with the resin are the major limitations of coarse wool based composites. The coarse wool has been modified using a mechanical, chemical and combination of both treatments. The composites developed using polyester and epoxy resin with 50-60% (by volume) reinforcement with wool fibre,



yarn and fabric. The composites showed a tensile strength of 28 MPa which is comparable with commercial glass composites. In addition, wool composite is lightweight (1.09 g/cm<sup>3</sup>) than the commercial one (1.22 g/cm<sup>3</sup>). The developed wool composites have potential applications in the automobile and construction sectors.



## International Sheep News

### Sheep embryos containing human cells! A possible future for readily available tailored human organs

At the University of California, Davis and Dr. Pablo Ross introduced human stem cells into the sheep embryos at a very early stage of their development and found that one in every 10000 cells in the embryo were human. This feat has achieved the dream of growing human organs inside other animals a leap forward. These chimeras – a term adopted from Greek mythology – were only allowed to develop for 28 days. This research will help growing human organs inside sheep, hence increased supply of human organs with the possibility of genetically tailoring the organs to be compatible with the immune system of the patient by using the patient's own cells in the procedure. The team leader Dr. Ross said that there are several advantages of using sheep embryos as they can be easily produced by IVF and only fewer embryos are needed for the experiment.



### International Exposure

- Dr. Vinod Kadam, Scientist (Textile Manufacturing), completed Ph.D. from RMIT University, Melbourne, Australia in 2018 under RMIT International Scholarship. He studied multifunctional respiratory air filter membranes using electrospun nanofibres.
- Dr. Vijay Saxena, Scientist (Animal Biochemistry), completed a collaborative research project on Targeting M – cells at University of Melbourne, Australia in 2018 under Indo-Australian Career Boosting Gold Fellowship.



## Glimpse of Celebration

### राष्ट्रीय भेड़-ऊन एवं किसान मेला व कार्यशाला का आयोजन

केन्द्रीय भेड़ एवं ऊन अनुसंधान संस्थान, अविकानगर में दिनांक 29 सितम्बर, 2018 को एक दिवसीय राष्ट्रीय भेड़-ऊन एवं किसान मेला एवं "किसानों की आय दोगुनी करने में सहायक छोटे पशु भेड़-बकरी एवं खरगोश" कार्यशाला का आयोजन किया गया।



मेले का शुभारंभ मुख्य अतिथि केन्द्रीय कृषि एवं किसान कल्याण मंत्री श्री राधामोहन सिंह जी ने फीता काट व दीप प्रज्वलित कर किया। कृषि मेले में बड़ी संख्या में आये लगभग 6000 किसानों, महिला कृषकों और वैज्ञानिकों को नवीन तकनीक आधारित रोजगारोन्मुख कार्यों में तेजी लाने का आह्वान किया। इस अवसर पर राजस्थान सरकार के कृषि मंत्री श्री प्रभुलाल सेनी जी, क्षेत्रीय सांसद श्री सुखबीर सिंह जोनापुरिया जी एवं क्षेत्रीय विधायक श्री कन्हैयालाल चौधरी जी ने भी किसानों को सम्बोधित किया एवं सरकार की विभिन्न कृषि कल्याणकारी योजनाओं के बारे में जानकारी दी।



विधायक जी ने क्षेत्र की समस्याओं के मद्देनजर किसानों के हितार्थ गाय-भैंस अनुसंधान व तकनीकी हेतु इस क्षेत्र में एक केन्द्र खोलने की मांग रखी जिसके केन्द्रीय मंत्री श्री राधामोहन सिंह जी ने स्वीकार करते हुये घोषणा की कि राष्ट्रीय डेयरी अनुसंधान संस्थान, करनाल का अविकानगर में दो माह में एक रिजनल फील्ड सेंटर खोल दिया जायेगा जिससे क्षेत्र के किसानों को पशुपालन में अधिकाधिक सुविधा एवं लाभ हो।





## New Publications



**ICAR-Central Sheep and Wool Research Institute**

**Value Addition of Sheep Milk**  
Y.P. Gadekar, A.K. Shinde, Arvind Sori, R.S. Bhatt and Arun Kumar

**Meat Processing for Profitable Entrepreneurship**  
S.P. Gadhavi, Arvind Sori, A.K. Shinde and Arun Kumar

**भेड़ के दूध का मूल्यवर्धन**  
2016-18

**अभियुक्त**  
2016-18

## Press Release

# टोंक पत्रिका



**अविकानगर के वैज्ञानिकों ने भेड़ के बालों की ऊन से बनाई मालपुरा रजाई**

**सेमिनार में शोधार्थियों ने संस्थान का किया भ्रमण**

**अविकानगर में दो माह के भीतर खुलेगा गाय-भैंस पर अनुसंधान के लिए रीजनल फीड सेंटर**

**अविकानगर में वैज्ञानिक शोध कार्य हिंदी में करने पर जोर, किसानों को भी होगा फायदा**



**अविकानगर संस्थान की ओर से डूंगरपुर में किसानों को मेंढों का निःशुल्क वितरण किया**

**सहत**

## Research Papers

- De K., Saxena, V. K., Balagnur K., Kumar D. and Naqvi S. M. K. 2018. Effect of short-term seclusion of sheep on their welfare indicators. *Journal of Veterinary Behavior*, 27:1-7. NAAS rating (2018): 7.50
- Gowane G. R., Swarnkar C. P., Prince L. L. L. and Tomar A. K. 2018. Genetic parameters for neonatal mortality in lambs at semi-arid region of Rajasthan India. *Livestock Science*, 210: 85-92. NAAS Rating (2018): 7.38.
- Kadam V., Wang L. and Padhye R., 2018. Electrospun nanofibre materials to filter air pollutants – a review. *Journal of Industrial Textiles*, 47(8): 2253-2280. NAAS Rating (2018): 7.35.
- Gowane G. R., Akram N., Misra S. S., Prakash V., and Tomar A. K. 2018. Genetic diversity of Cahi DRB and DQB1 genes in Sirohi goat. *Journal of Genetics*, 97(2): 483-492. NAAS Rating (2018): 7.00

## Trainings Conducted

### Advances in sheep production and utilization (Nov. 14-28, 2018)

The training programme (module-II of Certified Livestock Advisor) sponsored by National Institute of Agricultural Extension Management (MANAGE) Hyderabad with the theme to transform the agriculture extension personnel into specialist- Certified Livestock Advisor (Sheep). Dr. Davendra Kumar, Principal Scientist was the Coordinator. Dr. Arun Kumar Tomar, Director urged them to act as ambassador of ICAR-CSWRI to disseminate the knowledge and skills learned from training in the field.



### Basic research tools for textile testing and textile chemistry (July 31-August 23, 2018)

Twenty two (22) participants (M.Sc. / Ph.D. students and university faculty members) from Rajasthan, Haryana, Odisha and Punjab state participated in the training programme organized in collaboration with the Dalit Indian Chamber of Commerce & Industry (DICCI) Dindigul



chapter and Veterinary University Training Research Center (VUTRC) Dindigul of TANUVAS), for the farmers belonging to SC/ST at SRRC, Mannavanur on 5th September, 2018. A total of 50 livestock farmers including 35 women and aspiring entrepreneurs participated in the training programme.



**Improved cattle and goat husbandry practices for hill area livestock farmers belonging to SC/ST (Sept. 05, 2018)**

A training programme organized in collaboration with the Dalit Indian Chamber of Commerce & Industry (DICCI) Dindigul chapter and Veterinary University Training Research Center (VUTRC) Dindigul of TANUVAS), for the farmers belonging to SC/ST at SRRC, Mannavanur on 5th September, 2018. A total of 50 livestock farmers including 35 women and aspiring entrepreneurs participated in the training programme.

**Recent advances in sheep/rabbit production & wool utilization at SRRC, Mannavanur (July 02-08, 2018)**

The programme was sponsored by SCSP-TSP, Govt. of Karnataka. Eleven participants from Karnataka Veterinary, Animal and Fisheries Sciences University, Shivamogga and Hassan campus attended the programme.

**Forthcoming Programmes**

- A self-sponsored training program on natural dyeing and herbal finishing of textiles is scheduled from 05-21 January, 2019.
- ICAR sponsored short course on Laparoscope aided artificial insemination and embryo transfer in sheep from 14-23 January, 2019.

**Distinguished Visitors**

**Delegates of Asian Regional Conference on Goats (ARCG-2018) (25 Oct., 2018)**

International and National delegates of ARCG- 2018 visited Avikanagar as a part of the conference and interact with scientists and farmers. A technical exhibition, demonstrating

different technologies of the Institute was arranged for extending scientific know-how to all the delegates. The participants showed keen interest in various technologies and research products.



**The Secretary, DARE and Director General, ICAR visited ARC, Bikaner (2 Oct., 2018)**

Dr. Trilochan Mohapatra, Secretary, DARE & Director General, ICAR, New Delhi visited the ARC, Bikaner with Dr Joy Krushna Jena, DDG (AS), ICAR.



Dr Arun Kumar Tomar, Director presented overview, achievements and future research plans of the institute. Dr Trilochan Mohapatra stressed for adopting integrated farming system to double farmers income by 2022. He also advised to collaborate with different ICAR institute for livelihood and nutritional security of the farmers. Farmers of the different villages also interacted with the DG and discussed about their problems in sheep farming and other allied agriculture sectors. The DG and other dignitaries visited Chokla sector. They distributed Magra rams to the farmers under NPWSI (Magra Field Unit) for genetic improvement. He appreciated the staff members of ARC for excellent upkeep of animals and their surroundings at the centre.





**Dr Lalit K. Panwar, Hon'ble Vice Chancellor, Rajasthan Skill ILD University, Jaipur**

He visited institute on July 31, 2018 as a chief guest of self-sponsored twenty-one day training programme on Basic Research Tools for Textile Testing and Textile Chemistry from July 31, 2018 to August 24, 2018. He suggested to launch a one-year diploma course on skilled development in sheep farming and wool products at the institute in affiliation with the University.



निदेशक दूरदर्शन जयपुर एवं उनकी टीम द्वारा संस्थान का भ्रमण एवं पेट शो कार्यक्रम के लिये जानकारी जुटाना

दूरदर्शन जयपुर के निदेशक डॉ. राजकुमार नाहर एवं उनकी टीम द्वारा दिनांक 28.08.2018 को संस्थान का भ्रमण किया गया। सेक्टर नं 12 एवं खरगोश इकाई का अवलोकन किया एवं अपने कार्यक्रम पेट शो के लिये शूटिंग की एवं जानकारी जुटाई।



संस्थान के निदेशक डॉ. अरुण कुमार तोमर ने संस्थान द्वारा विकसित की गई नई नस्ल अविशान के बारे में दूरदर्शन टीम को बताया।

## हिन्दी सप्ताह समारोह

संस्थान में दिनांक 14 से 22.09.2018 तक हिंदी सप्ताह समारोह का आयोजन किया गया। इस कार्यक्रम के उद्घाटन समारोह के अवसर पर श्री खेमराज चौधरी जी, आई.ए.एस. एवं अतिरिक्त मुख्य सचिव पशुपालन, राजस्थान सरकार, मुख्य अतिथि के रूप में उपस्थित थे। उन्होंने संस्थान में किये जा रहे हिंदी के कार्य एवं अनुसंधान की प्रशंसा की। निदेशक डॉ. अरुण कुमार तोमर ने अपने संबोधन में सभी से आग्रह किया कि वो अपने दैनिक सरकारी कार्य मुख्य रूप से हिंदी में ही करें। उन्होंने आगे कहा कि भाषाएं देश की संस्कृति से जुड़ी होती हैं तथा भाषाओं का ज्ञान होना देश के लिए अच्छी बात है। श्री जगदीश प्रसाद मीना, वरिष्ठ तकनीकी अधिकारी (राजभाषा) ने हिंदी सप्ताह के दौरान होने वाले कार्यक्रमों की विस्तृत जानकारी प्रदान की।



## Farmer's Corner

अविमित्र



अविमित्र

|                                                                                               |                                                                                                         |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|  भेड़ पालन |  खरगोश पालन         |
|  उत्पाद    |  शुरुआती मार्गदर्शक |
|  सवाल-जवाब |  हमें संपर्क करें   |

अविमित्र-सी.एस.डब्ल्यू.आर.आई. के द्वारा एंज़ॉइड आधारित एप्लिकेशन किसान समुदाय को वैज्ञानिक सहयोग बढ़ाने के प्रयास में केंद्रीय भेड़ एवं ऊन अनुसंधान संस्थान अविकानगर ने दिनांक 29 सितम्बर, 2018 को संस्थान में माननीय केंद्रीय कृषि एवं किसान कल्याण मंत्री श्री राधामोहन सिंह जी के द्वारा एक एंज़ॉइड आधारित एप्लिकेशन "अविमित्र" लॉन्च किया गया।

**Sheep Database Management System Portal**  
(<http://sheepdbms.org.in>)

The Sheep Database Management System (DBMS) is an online database repository system designed to collect data from different centres working on sheep breeding and management at different places all over the country. All the data will be available on website as online server-based storage and only authorized persons can access the database.



### Dumba sheep Sale

Two Dumbasheep sold at the Institute for Rs 150000 (Rs. 75000 each) on 22.11.2018 to Uttarakhand Sheep and Wool Development Board, Dehradun, Uttarakhand.



### स्वच्छ भारत अभियान

संस्थान में 16-31 दिसम्बर, 2018 के दौरान स्वच्छता पखवाड़े का आयोजन किया गया, इस दौरान संस्थान के कार्यालय, स्कूल, दार्शनिक स्थल डिग्गी एवं अंगीकृत गाँव आदि में स्वच्छता अभियान का भी आयोजन किया गया। इसी अवधि के दौरान संस्थान में शपथ ग्रहण एवं स्वच्छता कार्यशाला के साथ-साथ 23 दिसम्बर, 2018 को किसान दिवस का भी आयोजन किया गया।



### Sports/Cultural activities

भारतीय कृषि अनुसंधान परिषद की क्षेत्रीय खेलकुद प्रतियोगिता में संस्थान का शानदार प्रदर्शन (5-8 Oct 2018)



भारतीय कृषि अनुसंधान परिषद की पश्चिमी क्षेत्रीय खेल कुद प्रतियोगिता का आयोजन भारतीय चरागाह एवं चारा अनुसंधान संस्थान, झांसी में हुआ जिसमें परिषद के विभिन्न संस्थानों के 600 से अधिक प्रतिभागियों ने हिस्सा लिया। प्रतियोगिता में संस्थान के कुल 32 प्रतिभागियों ने अपना उत्कृष्ट प्रदर्शन दिखाते हुए बास्केटबाल, वालीबाल स्मेशिंग एवं वालीबाल शुटिंग में 3 स्वर्ण पदक एवं एथलेटिक्स (100 एवं 400 मीटर दौड़ तथा साईकिल रेस) में 3 कांस्य पदक प्राप्त किये।

### अविकानगर में 72वें स्वतंत्रता दिवस समारोह का आयोजन

अविकानगर में 72वें स्वतंत्रता दिवस समारोह का आयोजन धूमधाम से किया गया। इस उपलक्ष में निदेशक, डॉ. अरुण कुमार तोमर ने ध्वजारोहण किया। संस्थान में "म्हारों हरियालों राजस्थान" अभियान के अंतर्गत परिसर में 72वीं वर्षगाठ पर 72 विभिन्न प्रकार के पौधे जैसे नीम एवं अर्जुन लगाकर स्वतंत्रता दिवस मनाया गया। इसकी पूर्व संध्या पर एक सांस्कृतिक कार्यक्रम की रंगारंग प्रस्तुति का भी आयोजन किया गया।



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