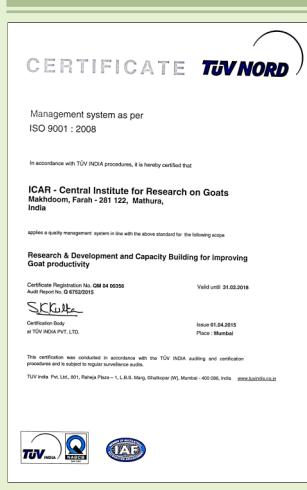




# CIRG news

केन्द्रीय बकरी अनुसंधान संस्थान  
Central Institute for Research on Goats



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## From the Director's Desk

I take immense pleasure in reaching out to goat farmers through CIRG news. I value the feedback that we receive from the stakeholders which is a direct reflection of work culture at our ICAR-CIRG. I am proud to say that the scientists and staff at our institute are working day-in and day-out for the projection of goat as our nation's pride. I am proud that our country has well preserved pure germplasm of goat breeds in various geographical zones.



The AICRP on goat improvement has played a significant role in identifying and networking the stakeholders involved in preserving these valuable goat breeds. The goat has changed the lives of many landless marginal farmers with success stories from across the country. I take pride in collaborating with various state governments for training all the stakeholders including farmers, veterinarians, livestock officers etc., for the establishment of goat husbandry as source of attractive investment with high returns. There is also a fruitful demand for more and more goat husbandry related hands-on training courses offered by ICAR-CIRG as evidenced by increasing applications received from throughout the country. By this I acknowledge the greater responsibility that we carry on our shoulders in supporting the cause that directly plays a paramount role in the livelihood of farmers. Role of women in goat husbandry is another reason we can rejoice for the increase in income of many families as witnessed through our learning experience from AICRP on goat improvement.

I congratulate the staff who participated in the institute annual sports meet organized on January 2017. My sincere thanks for the organizers in bringing out the annual sports meet. The Swachh Bharat Abhiyan is being implemented with full energy and fervour to ensure cleanliness and hygiene in the institute campus. For this, each division of this institute is assigned a few identified spots for monitoring the cleanliness and creating awareness among the residents about swachh bharat abhiyan. I thank everybody for their continued participation in this scheme and visible improvements could be seen in the campus in terms of cleanliness and waste disposal. Finally, I thank the editorial team of CIRG news in bringing out this beautiful issue.

(M. S. Chauhan)  
Director

## Inauguration of National Referral Laboratory for Testing of Animal Products



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It was a moment of great pleasure and satisfaction for the Institute as well as for us when honourable Deputy Director General (Animal Sciences), Dr. H. Rahman inaugurated National Referral Laboratory for Testing of Animal Products in the august presence of Dr. M.S. Chauhan, Director at Goat Products Technology Laboratory, ICAR-CIRG on 7<sup>th</sup> January, 2017.

Setting up of referral laboratory for testing of animal products was envisioned to develop state of art laboratory with world class facilities so that it can serve as a platform for the quality evaluation of animal products. This concept became reality with the financial support of Rs. 6.7 crore from Ministry of Food Processing Industries, Government of India. The objectives of setting up of this laboratory as under:

- To establish state-of-art National referral laboratory for testing of animal products at Goat Products Technology laboratory of ICAR-CIRG, Makhdoom.
- To establish and operate this lab as national level training institute for the quality testing of Animal products.
- To educate different stake holders in animal products production systems about quality and preventive measures of residues in food chain of animal products.
- To plan the sampling design and testing protocol for various residues, adulterants and quality parameters.

- To survey and analyse the status of residues and quality parameters in meat and milk in the region.

Referral laboratory has "Residue analysis laboratory" and "Advanced microbiology laboratory" facilities. In the residue analysis laboratory we have installed GC-MS/MS (1.1 Crores) and ICP-MS (0.9 Crores) besides other important instruments such as "Rapid protein analyser", "moisture analyser" "Milli-Q" and "freeze dryer". Using GC-MS/MS, we have now standard operating procedures for the analysis of organochlorine and organophosphate (20 each) pesticide residues, screening of phytochemicals from herbal extracts and amino acid analysis. We are now able to analyse different elements of periodic table including poisonous mercury (Hg), lead (Pb) and arsenic (As) by ICP MS. In the advanced microbiology laboratory we have installed, VIDAS pathogen monitoring system for the qualitative detection of *Salmonella*, *Listeria monocytogenes*, *E. coli* H7:O157, *Staphylococcus aureus* enterotoxin and TEMPO for quantitative evaluation of total viable counts, coliforms, *E. coli*, *Enterobacteriaceae* as well as yeast and moulds. Standard operating procedure for the analysis of above pathogens in animal foods has been developed. This laboratory is fully operational and very soon going to apply for NABL accreditation. As required for the accreditation, calibration of major and associated instruments of advanced microbiology laboratory has been completed. Laboratory has passed the proficiency testing with more than 95% accuracy in result. We have finalised the testing charges of the animal food products and it is now available in our website also. Laboratory has started evaluating various animal products as per the finalised charges.

## Flower Extracts as a Means to Enhance Meat Products Quality and Stability



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Nowadays the plant extracts are widely used in meat and meat products to check the oxidative deterioration. Oxidative changes have negative effects on the quality of meat and meat products, causing changes in the sensory and nutritional properties. Lipid oxidation can be reduced or inhibited by the use of antioxidants in meat

and meat products and thus the product quality and shelf-life can be improved. Antioxidants can prevent lipid peroxidation using the following mechanisms: preventing chain inhibition by scavenging initiating radicals, breaking chain reaction, decomposing peroxides, decreasing localized oxygen concentrations and binding chain initiating catalysts, such as metal ions. There are a huge number of compounds that have been proposed to possess antioxidant activity, but only a few can be used in food products. The antioxidants can be of synthetic or natural origin. Synthetic antioxidants such as butylated hydroxyanisole (BHA), butylate-

dihydroxytoluen (BHT), tert-butylhydroquinone (TBHQ), and propyl gallate (PG) have been widely used in meat and poultry products. Although synthetic antioxidants have already been used but in recent years, the demand for natural antioxidants, especially of plant origin has increased due to growing concern among consumers about these synthetic antioxidants because of their potential toxicological effects. Thus most of the recent investigations have been directed towards the identification of natural antioxidants from various plant sources.

Methanolic extracts of four flowers namely marigold (*Calendula officinalis*), hibiscus (*Hibiscus rosa-sinensis*), gaillardia (*Gaillardia aristata*) and sadabahar (*Catharanthus roseus*) were evaluated for their antioxidant potential and

phytochemical profiling so that these could be used as source of natural antioxidants in meat and meat products. Marigold and hibiscus flower had higher total phenolics as compared to gaillardia and sadabahar flowers. Total flavonoids in hibiscus and gaillardia were found higher with respect to marigold and sadabahar flowers. DPPH radical scavenging activity in all four extracts was found concentration dependent. Phytochemical profiling of methanolic extracts in GC-MS/MS showed presence of 40, 15, 20 and 21 peaks/component in marigold, hibiscus, gaillardia and sadabahar, respectively. The study with goat minced meat has shown very promising results as application of these flower extracts improved the product redness value, decreased free fatty acid and peroxide value.



## Minimising Weaning Stress in Goat Kids



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Weaning kids from the doe or shift from a milk-based to solid diet, is one of the most stressful events in a kid's life. Weaning stress can cause intestinal and immune system dysfunctions that result in reduced kid health, growth and feed intake particularly during the first two weeks after weaning. It is common for kids to lose weight or show stunted growth at weaning. This is also referred to as "weaning shock". Measures should be taken to reduce any adverse effects of weaning on the health and growth of kids. Goat kids grow very well if provided with milk until 10-12 weeks of age. Strategies for weaning kids from milk already separated from their dam are:

1. Preparation for weaning kids should start early at an early age. Kids must be exposed to hay and concentrates early in life, at about 14-15 days of age to promote proper rumen development. Sudden removal of milk without rumen adaption to solid feeds and adequate solid feed

intake can lead to reduction in growth and health complications.

**2.** It is best to wean kids based on their weight and amount of concentrate they are eating, not their age. Kids should be about 2.5-3 times their birth weight before they are weaned. Weaning kids based on the amount of solid feed they consume ensures that individual differences in development are considered and kids are able to absorb nutrients from solid feed before milk is withdrawn. This helps to prevent weaning shock. Kids should be eating about 1% of their body weight in solid feed before weaning. For a 10 kilogram kid, this is about 100 g of feed per day.

**3.** Gradual weaning has been found to be the least stressful weaning method for kids. In a gradual weaning program, milk allowance is slowly reduced over a period of several days. Gradual weaning is especially important if weaning kids earlier than 70 days (10 weeks) of age. Kids weaned before 70 days of age are much more likely to experience weaning shock (reduced growth) than those weaned after.

### Avoid stress at weaning

Stress can lead to reduced feed conversion, decreased

immunity, diarrhoea, increased excretion of pathogenic bacteria in faeces, poor meat quality, decreased productivity, decreased health and welfare. Avoid overcrowding of kids. Stressful procedures such as disbudding, mixing of groups, transportation, or changing housing should be avoided at the time of weaning. Avoid weaning of sick or compromised kids. Closely monitor kids for signs of stress or symptoms of

disease during weaning period. Early intervention can help in treating weaning shock before it becomes a serious problem.

Weaning is a significant event in the life of goat kids. By monitoring growth, body weight and feed consumption and reducing stress close to weaning goat keepers can safeguard the welfare and profitability of goat kids by reducing weaning stress.

## A Step Forward Toward Frozen Semen Artificial Insemination Technique in Goats



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The goats play a vital role in the economy of the poor and marginal farmers of rural India and very little effort has been taken for genetic improvement at farm level. Human population will be reach to 1.7 billion and goat population will be 216 million by 2050. Therefore to meet requirement of milk, meat and associated by products of ever increasing human population, it is imperative to increase goat productivity. It could be possible by increasing high productive descript (33%) goat population and reducing non-descript (67%) and less productive goats by promoting scientific goat farming. Artificial Insemination (AI), is the first generation of reproductive biotechnology by which we can replace the non-descript and less productive goats with productive goat population. AI and semen cryopreservation represents a pivotal tool for the long-term ex-situ *in vitro* conservation, exchange of valuable germplasm of livestock and endangered species. The greatest problem still existing with the cryopreservation of goat spermatozoa is that even with the best preservation techniques to-date available, post-thawing

survival is restricted to approximately 50% of the sperm population. The frozen semen AI could successfully be used for preservation, conservation and propagation in different breeds of goat. The ICAR also given the thrust area for research to our Institute and we are working in this direction. A Flagship programme on AI in Goat was completed for three years from 2014-17. Under this project we have optimized the post thaw motility in Jamunapari, Barbari, Jakhrana and Sirohi and were 52.8%, 54.4%, 48.8% and 46.2% respectively. The overall post thaw motility irrespective of breed was 50.55%. Artificial Insemination (AI) by using frozen semen straws having above mentioned post thaw motility was carried out. In two major breeding seasons of 2016-17 (May-June and October-November) 181 goats of different breeds (Barbari, Jakhrana, Jamunapari and Sirohi) including 35 goats in villages were inseminated with frozen semen in natural estrous condition. The insemination was carried out 12 hrs after detection of estrous and repeated after 12 hrs of first insemination. A total of 68 goats conceived by using frozen semen AI technology and total 121 kids (65 female and 56 male) were born through this technology. The kidding percentage in Barbari, Jamunapari, Jakhrana and Sirohi were 53.12%, 34.61%, 26.53% and 28.57% respectively. Overall, a success rate of 37.57% was recorded on the basis of actual kidding rate in different breed of goats maintained at this Institute under semi-intensive management system in 2016-17 compared to 13.64% in 2014-15 and 19.56% in 2015-16.

## Indian Employment Generation in Goat Sector: An Alternative Approach



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The goat sector is important from another angle too, that of the employment opportunity it provides to the landless, small and marginal households. Unlike agriculture, animal husbandry is more regular activity during the summer, rainy and winter seasons. Goat farming is an integral part of animal husbandry in the

country. For the last four decades it has remained a key element of the Government's poverty eradication programme. It is hard to estimate that how much employment the sector generates. We have tried to estimate employment generation from the following discussion. According to last three National Sample Survey Organization (NSSO) survey 2011-12, the total workforce of the country was 47.41 crores of which 33.69 crores people were in rural area and 13.72 crores in urban areas. The workforce in the country grew from 45.91 crores in 2004-05 to 47.41 crores in 2011-12. Out of which 23.18 crores persons were employed in agriculture and allied sector, 11.50 crores in industrial sector and 12.73 crores in service sector in 2011-12.

We may get data for number of persons employed in agriculture & allied activities, livestock being one such activity. Assuming that labour absorbed per unit of output

in livestock is the same as in agriculture. Therefore, the proportion of persons employed in livestock will be equal to its share in the value of output of the agriculture sector, livestock's share in the value of output of agriculture at constant (2011-12) prices was 26.1 per cent, the number of persons employed in livestock activities works out to over 6 crores. As per Department of Animal Husbandry & Fisheries (DAHD&F, 2012-13), the total value of output from livestock sector at current price was Rs.4,59,051 crores during 2011-12. However, the share of goat sector was estimated to be Rs. 38,590 crores (8.4 per cent of value of output from livestock). Keeping the same assumption in view, the labour absorption per unit of output in goat sector is same as in livestock sector. Then, the proportion of persons employed in goat sector will be 0.51 crores (5.1 million). It is about 1.5 percent of country's total workforce in rural area.

## Ticks Infestation in Goats: A Serious Rainy Season Problem



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Ticks infestation is a serious problem in goat production system. It is widespread and all season problem, however, more common and rampant in rainy season. Problem starts from July month after first spell of rain in last of June or start of July. Ticks lay their eggs in cracks and crevices of animal houses or in soil. Lowering of temperature and high humidity of rainy season helps the hatching of eggs and migration of hatched out larvae to tips of grass blades in grazing land. Goats get infested with tick larvae while grazing the infested pasture or with contact of infested animals. Goat mounted larvae roam on the body of animals and get attached preferably to sites like ears, below the tail, interdigital spaces of foot though they may be found attached anywhere on body. The larvae suck blood immensely and drop down to the ground at repletion to moult to next stage larvae. Next stage larvae again mount to goats and repeat the life cycle it metamorphoses to adult ticks. There may be one, two and three host ticks depending on number of host they use for completion of their life cycle. While sucking blood from host, ticks irritate the animals. Infested goats become annoyed, restless and uncomfortable and get interrupted sleep. Tick infested animal shows loss of appetite, luster,

weakness, rough and lost hair coat due to rubbing and scratching of their body. When ticks are lodged in interdigital space, the animal may show lameness. The mucus membranes are yellowish showing anaemia if the infestation is severe. Ticks, while sucking blood, can also transmit some infections like Babesia, Theileria, Anaplasma and also some bacterial infection. Toxin produced by some ticks may lead to paralysis. The overall syndrome is known as Tick worry.

The production of animal is severely affected and goes down. The condition being contagious in nature, can spread in whole herd. The factors like hot and humid climate, high stocking rate, poor hygiene, housing and health can help the spread of tick infestation.

The problem of tick infestation in goat and sheep needs immediate attention. Quality management like hygiene, cleanliness of shed, cracks and crevices free housing, fire treatment of floor and walls, proper stocking rate, good nutrition with necessary mineral and vitamin supplement can effectively control the tick infestation in goats or sheep. Further health practices like spraying, dusting and dipping with acaricidal drugs can effectively control the tick problem in goats. Dipping of infested animals in 0.4-0.5 percent solution of Deltamethrin, Cypermethrin and Malathion like acaricides can be



helpful. The animals should be dipped before and after monsoon as a routine. Use of avermectin or any other macrocyclic lactones group acaricides intramuscularly (0.2mg/ Kg BW) is also practiced for controlling the problem. The problem can also be cured by using some pour on preparation available in market. For dipping 4 essential things to carry are 1. Avoid dipping of newly born, sick and old animals 2. Dipping should be arranged

in clear weather when sun shine is good 3. Provide drinking water to animals before dipping and 4. Do test dipping to cross check the proper concentration of drug and avoid accident. However, it is well said that prevention is better than cure, the farmers are advised to improve livestock management as it would help to keep animals away from tick seed i.e. infesting larvae.

## Infectious Diarrhoea in Neonatal Goat Kids



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Diarrhoea particularly during the first few weeks (3-4 weeks) after birth is important ailment which is responsible for high morbidity and mortality in neonates of the most animal species, and it is documented as a frequent cause of kid mortality all over world. In livestock, diarrhea is called scours, and the mortality due to diarrhea may go up to 60%. There are many causes of diarrhea such as infectious agents, metabolic disorders, diets etc., but infectious diarrhoea is the commonest, and the most severe one. Infectious diarrhea in the neonatal kids is caused by bacteria (*Escherichia coli*, *Salmonella* spp., *Clostridium perfringens*, *Yersinia* etc.), viruses (Rotavirus, Coronavirus, Adenovirus etc.) and parasites (*Cryptosporidium* spp. etc.). The four major causes of the infectious diarrhea in the neonatal kids are colibacillosis (white scours /yellow scours/ watery mouth), rotavirus infection, salmonellosis and cryptosporidiosis. Out of them, colibacillosis is the most common in bacterial diarrhea while; rotavirus and *Cryptosporidium* spp. are the most common in the viral and parasitic agents respectively. Overall, colibacillosis is the most common among the infectious agents, and it is frequently seen in kids less than 10 days of age, but is the most common at 1 to 4 days of age. It usually presents itself as an outbreak in kids between 12 and 48 hours of age. *Escherichia coli* (*E. coli*), the causative agent of colibacillosis is generally a normal commensal gram-negative rod-shaped bacterium that lives inside the intestinal tracts of humans and warm-blooded animals. Pathogenic strains of *E. coli* can be differentiated from their nonpathogenic counterparts by the presence of virulence genes, which code for adherence and colonization, invasion, cell surface molecules, secretion, transport, and siderophore formation. Based on

the type of virulence factor present and host clinical symptoms, pathogenic *E. coli* strains associated with diarrhoea are categorized into six pathotypes: (i) enteropathogenic *E. coli* (EPEC) (ii) enterotoxigenic *E. coli* (ETEC) (iii) shiga toxin producing *E. coli* (STEC) or verotoxin producing *E. coli* (VTEC) (iv) enteroaggregative *E. coli* (EAEC) (v) enteroinvasive *E. coli* (EIEC) (vi) diffusely adherent *E. coli* (DAEC). EIEC and EAEC strains are normally found in humans, and rarely seen in animals. Most species of the genus *Salmonella* are capable of producing diarrhea; *Salmonella Typhimurium* is the most common serovar of the genus in goats. In salmonellosis, the kids less than 1 week of age are more likely to die without clinical signs, whereas the animals older than 1 week are more likely to have diarrhea. Kids are generally infected with group B rotaviruses, whereas most other animals (except sheep) and humans are infected with group A rotaviruses. Rotavirus generally causes diarrhea in kids and lambs at 2 to 14 days of age. In goats, rotaviral diarrhoea is frequently seen during winter season. *Cryptosporidium* spp. was identified one of the most common agents that causes diarrhea in neonatal goat kids. *Cryptosporidium* spp. is a protozoon that can cause diarrhea similar to that of rotavirus, and mainly affect kids from 5 to 15 days of age. Apart from mortality (up to 40%), cryptosporidiosis causes decline in productivity, retarded growth, decreased feed efficiency, delayed maturity, loss of fertility, and financial loss in the form of treatment expenses.



## Extension and Farmer's Education Programme

### Farmers' Training Organised

#### National Training Organised

- Organized 69<sup>th</sup> National Training Programme (10 days) on Scientific Goat Farming from 16<sup>th</sup> to 25<sup>th</sup> March, 2017 at ICAR-CIRG, Makhdoom. In this training programme 102 trainees (96 male and 06 female) from 19 States were present.
- Organized 70<sup>th</sup> National Training Programme (10 days) on Scientific Goat Farming from 18<sup>th</sup> to 27<sup>th</sup> May, 2017 at ICAR-CIRG, Makhdoom. In this training programme 97 trainees from 12 States were present.



### Sponsored Training

#### Trainers Training Organised

- Organised sponsored training programme on 19<sup>th</sup> to 25<sup>th</sup> January, 2017 (7 days) for 13 veterinary officers sponsored by Directorate of Animal Husbandry, Government of Punjab.
- Organised sponsored training programme on 31<sup>st</sup> January to 2<sup>nd</sup> February, 2017 (3 days) for 10 veterinary officers sponsored by Veterinary Officers Training Institute (VOTI), Odisha.
- Organised sponsored training programme on 7<sup>th</sup> to 9<sup>th</sup> February, 2017 (3 days) for 10 veterinary officers sponsored by Veterinary Officers Training Institute (VOTI), Odisha.
- Organised sponsored training programme on 1<sup>st</sup> to 7<sup>th</sup> March, 2017 (7 days) for 15 veterinary officers sponsored by Chattisgarh Kamdhenu Vishwavidyalaya, Durg.
- Organised sponsored training programme on 5<sup>th</sup> to 9<sup>th</sup> June, 2017 (5 days) for 14 veterinary officers sponsored by Animal Husbandry Department, Government of Uttar Pradesh.



#### Farmers' Training Organised

- Organised sponsored training programme on Scientific Goat Farming on 2<sup>nd</sup> to 6<sup>th</sup> February, 2017 (5 days) for 20 farmers sponsored by Department of Irrigation and Water Resources, Behjoi, Sambhal, Government of Uttar Pradesh.
- Organised sponsored training programme on Scientific Goat Production on 20<sup>th</sup> to 23<sup>rd</sup> February, 2017 (4 days) for 10 farmers sponsored by Animal Husbandry Department, Odisha.
- Organised sponsored training programme on Scientific Goat Production on 29<sup>th</sup> May to 1<sup>st</sup> June, 2017 (4 days) for 30 farmers sponsored by Indian Institute of Soil and Water Conservation (IISWC), Kota (Rajasthan).

### Exhibition/Kisan Mela Participated

- Participated in Sheep Wool Fair at ICAR-Central Sheep and Wool Research Institute, Avikanagar on 4<sup>th</sup> January, 2017.
- Exhibited goat technologies in Gramodaya Mela at Chitrakoot Satna (Madhya Pradesh) on 24<sup>th</sup> to 27<sup>th</sup> February 2017.
- Participated in Krishi Unnati Mela-2017 at ICAR-Indian Agricultural Research Institute (IARI) Pusa, New Delhi. ICAR-CIRG stall win Appreciation Award by the organizing committee.
- Participated in Krishi Mela at Motihari on 13<sup>th</sup> to 19<sup>th</sup> April, 2017 organised by ICAR Research Complex for Eastern Region (ICAR-RCER), Patna.

## Extension and Farmer's Education Programme

- Showcased goat technologies at Bundelkhand Srajan 2017 National Expo at Teekamgarh, Madhya Pradesh on 6<sup>th</sup> to 7<sup>th</sup> May, 2017.



## Events

### ● Republic Day Celebration

ICAR- Central Institute for Research on Goats celebrated 68th Republic Day with joy and happiness on 26<sup>th</sup> January, 2017. Dr. M.S. Chauhan, Director of the Institute hoisted the National flag. In his address, he congratulated the scientific, technical, administrative and supporting staff of the institute for the occasion. He hailed the contribution of scientists in uplifting goat farmers of the country by providing scientific knowledge and skills to the goat farmers.



### ● International Yoga Day Celebration

ICAR- Central Institute for Research on Goats celebrated International Yoga Day on 21<sup>st</sup> June 2017. Yoga awareness programme and Yoga shivir was organized on this occasion. Scientific, technical, administrative and supporting staff of the institute along with their family members participated in this programme. Yoga instructors beautifully explained the importance of yoga in day today life and demonstrated different Yogasanas and Pranayams to staff and their families in the programme. On this occasion Dr. M.S. Chauhan, Director, CIRG highlighted the importance of yoga in today's hectic life and asked the staff to practice it regularly.



### ● The 17<sup>th</sup> Annual Review Meet (ARM) of ICAR-AICRP on Goat Improvement held at High Mountain Arid Agriculture Research Institute, SKUAST-K, Leh-Ladakh

The 17th Annual Review Meet of AICRP on Goat Improvement was held on June 12-13, 2017 at HMAARI, SKUAST-K, Stakna, Leh – Ladakh. The inaugural session was chaired by Prof. Nazir Ahmed, Hon'ble Vice Chancellor, SKUAST-K. Dr. Sonam Dawa Lompo, CEC, LAHDC, Leh was the chief guest and Dr J. K. Jena, DDG (AS), ICAR was the special guest. Besides the above dignitaries, the session was attended by Dr. R. S. Gandhi, ADG (AP&B), ICAR. Dr. M.S. Chauhan, Director, ICAR-CIRG,



Makhdoom, Prof. M.Y. Zargar, Director Research, SKUAST-K, Dr. Vineet Bhasin, Principal scientist, ICAR, New Delhi, Dr. P. K. Rout, Incharge, AICRP on Goat Improvement along with unit incharges of different AICRP units, other university officials and students.

## Events

The session started with a formal welcome of dignitaries by Prof. M. Y. Zargar, Director Research, SKUAST-K. The Director ICAR-CIRG, Dr. M. S. Chauhan, in his inaugural deliberation provided an overview of AICRP on Goat improvement as well as the role of goats in livelihood security. Dr. Arjava Sharma, Director, NBAGR, emphasised to initiate breeding programme for goat-breed wise in different agro-climatic zone. Dr. R. S. Gandhi, ADG (AP&B) about livestock biodiversity in Ladakh region, importance of goat milk and urine as a medicinal value. The guest of honour Dr J. K. Jena, DDG (AS), ICAR focused on the initiating work on the remaining goat breeds of India under the project as well as developing value chain in goatery. Prof. Nazir Ahmed, Hon'ble Vice Chancellor, SKUAST-K in his address to audience emphasised on the importance of livestock as a component in integrated farming system in cold arid mountain region. He also explained economic value of pashmina goat and fibre. Indian pashmina fibre is the best quality fibre as compared to China and Mongolia. The chief guest Dr. Sonam Dawa Lompo, CEC, LAHDC, Leh in his deliberation, highlighted the importance of goat with respect to other animals. He also emphasized the need of pasture land development in Leh region and provided integrated solution for livelihood security. The programme was followed by release of publications, Annual PC Report, Kid Management, Silage making by Changthangi Goat Unit.



All the unit incharges presented their progress report in two technical sessions. A field visit was also organised to Kharnak/Samad cluster of Changthani Goat field unit.

### ● CIRG Organized Brain Storming Meeting on AI in Goats

A brain storming meeting on 'Action plan for implementation of artificial insemination (AI) in Goats in India' was held on 3<sup>rd</sup> May 2017 at ICAR-CIRG, Makhdoom under the chairmanship of Prof. (Dr.) M.L. Madan, Ex DDG-AS (ICAR), Ex VC DUVASU, Mathura and Dr PDKV, Akola. Invited Experts viz., Drs. K. P. Agrawal, Ex National coordinator NATP and NAIP; S.M.K. Naqvi, Director, ICAR-CSWRI, Avikanagar, T. K. Mohanty, Principal Scientist, ABRC, ICAR-NDRI, Karnal, Dr. P. S. Yadav, Head (APR), ICAR-CIRB, Hissar; Pradip Ghalsasi, Associate Director, NARI, Phalton; Syed Mohmand Shah, I/c Semen Lab., SKUAST, Srinagar; Atul Saxena, Head (O&G), Sarvjeet Yadav, Head (AP), DUVASU Mathura and CIRG experts actively discussed and participated in meeting. Director of Institute, Dr. M. S. Chauhan, welcomed the Chairman and participants, and presented an overview on the goat production in the country and CIRG work on the subject over past few decades. Dr. K P Agrawal, in his address emphasized the importance and future plan for research in Goat AI. Prof. Madan emphasised to revisit and thoroughly review the past work and accordingly address our research and development needs so as to take this technology to its end users to bring profitability to the animal owners. He strongly emphasized that adoption of AI in small ruminants in both extensive and intensive systems is the only assured and fast method for animal improvement and reach the farmer's at their door. Thereafter, he invited the experts to make their presentations, requesting them to be focussed to take the technology to field for animal improvement using AI to deliver the best quality germplasm to the vast population of goats. Few important points emerged out of discussion are information about small ruminant resource of the country and current status of AI in goats (both, globally and in the country) should be available on the website of CIRG and should be dynamic and should be updated at regular interval, developing model protocol for semen freezing and AI technology, establishment of viable goat semen bank following scientific guidelines. Post discussion, the Chairman identified an urgent need to develop a Working Paper of standard practices, as output from the brainstorming. This document should be a "State of Knowledge" paper with regards to



## Events

Goat semen-production, availability, Cryopreservation technique, AI procedures, health management, economics, product value addition/production and marketing. Based on the current status, Chairman suggested to develop MODEL PROTOCOLS for goat AI procedures for use of different central and state agencies to have scientific validity and uniformity for National development plan.

- **CIRG Organized National Productivity Week**

National Productivity Week was held during 12-18<sup>th</sup> Feb, 2017 and the National Productivity Day was celebrated on 12<sup>th</sup> February, 2017. All the Heads of Division, Scientists, Technical officers, Administrative officer, Finance and Account officer, students and research scholars were participated in Round Table Discussion—"Goat Productivity" on 13<sup>th</sup> February, 2017. The Director of this Institute emphasized the importance of goat in Indian economy and livelihood security of farmers. There is need to apply the goat husbandry technologies to enhance the productivity of goat, hence, four lectures for 85 farmers including 35 women from Daulatpur, Nagla Chandravan and Barka Nagla village, Farah, Mathura, U.P on different aspects of goat rearing were organized. The women goat farmers were very much benefited after practical demonstration of preparation of goat milk paneer. Painting competition with the theme on "Goat productivity from Waste to Profit through Reduce, Recycle and Reuse" was organised on 16<sup>th</sup> February, 2017. In all, 21 participants from research scholars and ward of staffs took part in the competition.

- **CIRG Observed Swachtha Pakhwara**

As part of the ongoing activities under Swachh Bharat Abhiyan programme, Swachtha Pakhwara was observed from 16-31<sup>st</sup> May 2017 for preparing long term action plan to keep the Institute premises CLEAN and GREEN. The new initiatives undertaken for long term were allotment of areas for different divisions/sections of Institute in addition to their own premises for keeping their premises clean. The communications regarding cleanliness drive are made through Email only to achieve the target of paperless office. All the officers are sensitized to use mail for circulars, note, training schedule etc instead of using papers. Regular follow up of the targets assigned to different staffs are monitored, sensitized to take up activities in true spirit in allotted areas. As part of sensitization, stories and messages pertaining to cleanliness drive are mailed to staffs of the Institute continuously. Prepared plan for long term activities like collection and disposal of degradable and non-degradable waste materials separately. Accordingly, the areas of existing solid waste pits in the residential areas are focused for cleaning and disposal in pits. To avoid burning of polythene and solid wastes, the plastic pickers from the local area were called and allowed them for collecting the polythene and non-degradable materials from existing solid waste.



- **Annual Sports Meet**

The annual sports meet was organized at ICAR-CIRG with much enthusiasm and sportsmanship from 23<sup>rd</sup> to 26<sup>th</sup> of January 2017. The sports meet was organized by a team under the Chief Patron – Director of the Institute, Dr. M.S. Chauhan constituting Chairman of sports organizing committee Dr. M.K. Singh, Organizing secretary Dr. Souvik Paul and Management secretaries Mr. Jitender Gaite and Mr. Rajiv Kulshreshth. The inauguration and flag hoisting was conducted on 23<sup>rd</sup> January 2017 in the presence of Director, organizers, participants and staff of the institute. This was followed by introduction of teams to the Director. Following this the gathering was addressed by Director and the organizers took charge of the events. The various events that were arranged are outdoor events like Volley ball,

## Events

Kabaddi, football, cricket and athletic events for staff and wards. The indoor games included Badminton, Table tennis, chess and carom. Besides this, events like throw ball and musical chair for girls and 30 meter race were conducted for sub-juniors. The winners of various events received prizes from the Director, ICAR-CIRG Makhdoom. Later the cultural night was arranged on 25<sup>th</sup> January 2017 by the team of Ladies club headed by the President, Madam Mrs. Veena Chauhan. All events ended on the following day with events like Rangoli competition and patriotic songs.



## Production of Chimeras by Tetraploid Complementation Assay



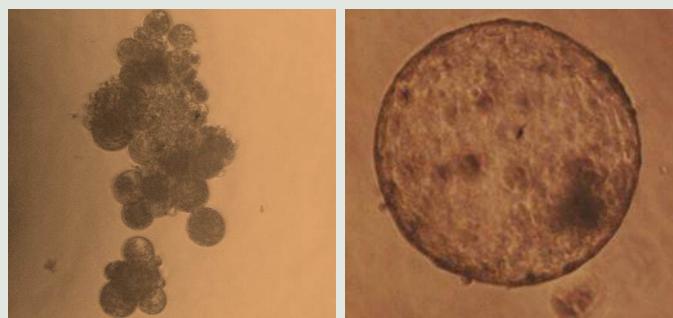
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The word Chimera is derived from Greek word Chimæra which means "she-goat", a monstrous fire-breathing hybrid depicted as a lion, with the head of a goat arising from its back, and a tail that might end with a snake's head. The production of chimeras is a common step in the establishment of genetically modified animal strains. Chimeras also provide a powerful experimental tool for following cell behavior during both prenatal and postnatal development.

Chimeric embryos can be produced by a number of techniques, including simply culturing embryos on a lawn of ES cells. The two most common methods of producing chimeric embryo from ES cells are by the injection of ES cells into the blastocoel cavity of a blastocyst stage tetraploid embryo and by the aggregation of ES cells with tetraploid embryos. Although blastocyst injection allows the investigator to scrutinize each cell that will be injected and select only those cell morphologies that are most likely to colonize the chimeric animal efficiently, it requires access to specialized equipment and is considered by some to be technically more demanding. Aggregation, on the other hand, requires no specialized equipment and is inexpensive and relatively easily learned, but it sacrifices the ability to select ES cells individually. In chimeric embryos, reconstructed with diploid parthenogenetic embryonic stem (ES) cells and tetraploid ivf blastomeres, known as tetraploid complementation assay, diploid cells contribute to the

inner cell mass, whereas most tetraploid cells contributed to trophoectoderm. ES cells are pluripotent cell lines derived from late blastocyst-stage embryos, which are capable of differentiating into all derivatives of the primitive ectoderm when aggregated with or injected into embryos. In contrast, tetraploid embryos, which can be made by electrofusing two cell-stage diploid embryos, have been found to contribute preferentially to most of the extraembryonic cell lineages, i.e., the trophoblast (trophectoderm derivatives) and primitive endoderm derivatives when aggregated with diploid embryos. Interestingly, ES cells show a deficiency in extraembryonic lineages. Therefore, these cells and tetraploid embryo derived cells have a complementary distribution in chimeras made between them. In such chimeras, the embryo proper, the amnion, the yolk sac mesoderm, the allantois and the chorionic mesoderm-derived part of the placenta are completely ES cell-derived, whereas the yolk sac endoderm and the trophoblast cell lineages are tetraploid embryo derived. It is certain that the ES cell↔ tetraploid embryo aggregates have an attractive feature in that they are a reliable and simple way of producing completely ES cell-derived embryos from developmentally competent cell lines. This feature is promoting their application in a number of studies.



## Distinguished Visitors

Dr. Narendra Singh Rathore, DDG (Agricultural Education), ICAR Visited ICAR-Central Institute for Research on Goats, Makhdoom on 25.03.2017 and inaugurated the Farmers' Training Hall at the Institute and also distributed certificates to the trainee farmers on the occasion of valedictory function of the 69<sup>th</sup> 10 Days (16-25 March, 2017) National Training Programme on 'Scientific Goat Farming'. Dr Manmohan Singh Chauhan, Director of the Institute presided over the function.



Dr. D.S. Chauhan Hon'ble Vice Chancellor GLA University Mathura visited ICAR-CIRG on 18<sup>th</sup> May 2017.

## Honour's, Awards and Recognitions



- Dr. S. K. Jindal, PS & Head, APR Division, ICAR-CIRG, Makhdoom awarded with ISSGPU Fellowship Award during National Seminar from 9-10 March, 2017 at Avikanagar, Rajasthan.

- ICAR-CIRG stall win Appreciation Award by the organizing committee of Krishi Unnati Mela-2017 at ICAR-Indian Agricultural Research Institute (IARI) Pusa, New Delhi.



### ICAR-Central Institute for Research on Goats,

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