



CIRG news

भा.कृ.अ.प. -केन्द्रीय बकरी अनुसंधान संस्थान
ICAR-Central Institute for Research on Goats
(An ISO 9001:2008 Certified Organization)



ICAR-CIRG gets
ISO 9001: 2008
Certification



ICAR-CIRG has been awarded ISO 9001:2008 Certificate for Research & Development and Capacity Building for improving goat productivity.

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From the Director's Desk

India with 135 million goats is one of the largest goats owning country in the world and playing a significant role in livelihood and nutritional security as well as providing supplementary income to nearly 70 million farmers of over 5,00,000 remote villages. Goat meat production in the country has increased from 0.47 to 0.59 million tons with an annual growth rate of 2.4%. Whereas goat milk increased from 3.6 to 4.7 million tons with annual growth of 2.6% during the last decade (2002-2011).



The country stands first in goat milk production and is the second largest in goat meat in the world by sharing 29% & 12% production, respectively. Goat milk and milk based products are gaining popularity among health conscious people. This would open a newly unexplored area to intervene and tap the potential consumer driven market for goat milk based commercial and beauty or cosmetic products. Goat meat "Chevon" has a high ratio of polyunsaturated to saturated fatty acids making it healthier for consumption in relation to cardiovascular and other diseases in human beings. These areas can be addressed by popularizing goat husbandry as an alternative source for livelihood of small, marginal and landless farmers as well as re-incarnating the goat industry into commercial venture for aspiring industrialists that would bolster the projection of goat as a "Future animal". The Central Institute for Research on Goats, Makhdoom is working since its inception to popularize goat husbandry and encourages young entrepreneurs to take up commercial goat farming. To support this institute is involved in imparting training to different stakeholders including state veterinary officers and goat farmers. Goat has an innate advantage in adapting to extreme conditions and coping up with climate change. Mortality and morbidity to infectious diseases is another area of concern where it still needs greater attention and requires widespread coverage of vaccination and other prophylactic measures. Besides, diseases caused by microbial and parasitic agents, metabolic diseases are another category of diseases, which requires planning and awareness among the farmers to control sudden mortality, particularly when goats are exposed to feed on crop residues rich in carbohydrates.

Many distinguished dignitaries including Dr. S. Ayyappan, Secretary DARE and DG ICAR, Dr. K.M. L. Pathak, DDG (AS), Dr. A.K. Sikka, DDG (NRM), Dr. N.K. Krishna Kumar DDG

(Hort.), ICAR and Shri. Giriraj Singh Hon. MoS for Micro, Small & Medium Enterprises, Govt. of India visited the institute and appreciated overall maintenance and progress of the institute. The institute organized different training programmes on scientific goat farming and a regional workshop on Nutrition and Feeding strategies for goats: Linking Climate resilient feeding and poverty alleviation. The institute has been bestowed with the ISO 9001-2008 certification for Research and Development and Capacity Building for improving goat productivity. My heartfelt

thanks to all the team members who worked hard for getting ISO certification in a short time frame.

I would like to congratulate the editorial team for their sincere efforts for bringing out CIRG news in time and hope it would prove useful to the scientists, policy planners, academicians, entrepreneurs and other stakeholders working in the field of goat production.



S. K. Agarwal
Director

Outbreak of ruminal acidosis in sheep and goats at Village Badauthi, Vrindavan, Mathura



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An outbreak of ruminal acidosis (grain engorgement) was recorded in farmer's flock at village Badauti, Vrindavan, Mathura. A flock of sheep and goats consisting of 164 sheep and 9 goats started showing symptoms of tympany and sudden death just after returning from grazing on wheat fields damaged due to un-seasonal rains and hail-storm. The entire flock was affected within short period of 18 h (from the evening of 21.4.2015 to the morning of 22.4.2015) 22 sheep and a goat died. Diarrhoea, tympany, dullness, depression and inappetence was observed in the live animals of the flock. Rectal temperature was within normal range.



Of the 23 carcasses, 3 (2 sheep and 1 goat) were necropsied. The carcasses were bloated with manifestation of tarry - frothy sanguineous discharge from the oro-nasal orifice. Grossly, rumen was highly distended due to presence of large quantity of wheat grains mixed with wheat straw. Sloughing of ruminal mucosa was observed. Ruminal contents were frothy and acidic (pH - 4.5). Visceral cavity contained large quantity of sanguineous fluid. Hyperaemia of the major blood vessels supplying the omentum, mesentery, lungs and

heart was evident. Kidneys showed petechiae to ecchymotic haemorrhages and congestion at the cortico-medullary junction. Small intestine showed catarrhal enteritis and engorgement of the mesenteric vein. Team of scientists from ICAR-C.I.R.G visited the site of outbreak and took immediate measures to control mortality in the flock. Soda-bicarb was administered orally to neutralize acidic pH in the rumen. The affected animals were treated with broad spectrum antibiotics (Enrofloxacin, Amikacin), anti-histaminics (Chlorpheniramine maleate), NSAIDs (Meloxicam) and Liver extracts (Belamyl). Intravenous administration of Soda-bicarb, normal saline and by parenteral Vitamin B1 were recommended. Further venturing and grazing of animals in and around fields containing fallen wheat crop was stopped immediately. The dead animals were disposed off by deep burial method.

Of the four seriously sick animals, 2 succumbed on 23.4.2015, while rest of the flock of sheep could be saved due to prompt and timely action of C.I.R.G and the State Animal Husbandry Department, Mathura. Sudden deaths in sheep and goat due to 'per acute ruminal acidosis' were caused owing to over-grazing in the wheat fields laden with fallen grains. The wheat crop was damaged due to unseasonal rains and hailstorms. The symptoms were more severe in sheep as they browse close to the ground and had ingested more grains.

The present outbreak implies the intricate relation of climate and animal health. Developing an effective and sustainable animal health service and emergency preparedness systems is perhaps the most important strategy for reducing the impact of sudden climatic changes on animal health in developing countries like India.

Methane mitigation using different nitrogen sources in concentrate



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Methane mitigation was attempted using alternate hydrogen sink for rumen methane production. Urea is used as nitrogen source in ruminant feeding, which is containing 46 % nitrogen. The potassium nitrate (KNO_3) is having 13 % nitrogen and can be used in ruminant feeding to supply nitrogen as well as a source of alternate hydrogen sink for reducing methane production. The urea was added in concentrate mixture at 1.5 % and the urea was replaced by KNO_3 at 0, 3, 4, 5, 6 and 7 %. The crude protein levels of concentrates were maintained between 20 to 22 %. Replacement of urea by KNO_3 reduced methane production (ml/100 mg truly digested

substrate) among replacement levels. The lowest methane production (ml/100 mg truly digested substrate) was 2.12 ml in 7.0 % KNO_3 included concentrate feed followed by 2.82 ml in the combination of urea 0.75 and KNO_3 4 % included concentrate. The methane reduction was achieved up to 44.65 % in concentrate feed with 7.0 % KNO_3 inclusion. Reduced protozoa numbers accompanied the inclusion of KNO_3 in concentrate mixture at 7 % level, whereas pH, NH_3 -N and TVFA were affected but were not having a definite trend. These concentrate mixture were used in composite feed mixture with wheat straw at R:C ratios of 60:40, 50:50 and 60:40, for the determination of methane production potential of KNO_3 in composite feed mixtures. Results of KNO_3 inclusion demonstrated that the KNO_3 can reduce methane production in ruminant feeds from 5 to 44 %, however level of reduction could be associated with the level of feeding.

Honour, Awards and Recognitions

- Dr. S.K. Agarwal, Director ICAR-CIRG Makhdoom was awarded with Bioved Agri-Innovation Award-2015 by Bioved Research Institute of Agriculture and Technology on 21.02.2015 at Allahabad.
- Dr. R.B. Sharma, Principal Scientist, Animal Nutrition & Product Technology Division of Institute was awarded ISGBRD Fellowship-2015 by the Indian Society of Genetics, Biotechnology Research and Development in the International Conference on 'Emerging trends in Biotechnology and Science with Special Reference to Climate Change' at Banasthali Vidyapith during February 18-20, 2015.
- Dr M. K. Tripathi, Principal Scientist, Animal Nutrition & Product Technology Division of Institute honoured with "Fellow of Animal Nutrition Association (FANA) of India" for the year 2013-14 in the ANA Con 2015 Biennial Conference at Assam Veterinary College, Khanapara, Assam on 22nd January 2015. This award has been bestowed upon him for his outstanding contribution made in the field of Animal Nutrition.
- Dr M. K. Tripathi was appointed as "Endeavour Award Ambassador" on 18th February 2015 at New Delhi by the Australian High Commission to India during a function of the Alumni of Austrian Awardees.
- Dr. Chetna Gangwar, Scientist, Animal Physiology & Reproduction Division of Institute was awarded 1st prize in Kisan Mela in 'Scientific knowledge dissemination' held at U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalya evam Go-Anusandhan Sansthan, Mathura, on 19-21 Feb 2015.



Hydrocyanin Poisoning in Goats



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Poisoning cases due to toxic principles are not uncommon in goats. It is mainly due to the feeding pattern in goats which is rather browsing than grazing, they consume certain tree leaves, pods that might have concentrated toxic principles. Among these, cyanide poisoning has been one of the most important causes of plant toxicity during dry periods. Cyanide inhibits cytochrome oxidase and causes death from histotoxic anoxia. Mostly it is caused by ingestion of plants with cyanogenic glycosides such as *Sorghum* spp, *Prunus* spp, *Zea mays* (corn), and *Acacia leucophoea* (Remza). The cyanogenic glycosides in plants yield free hydrocyanic acid, also known as prussic acid. In *Sorghum* spp leaves/grasses usually produce 2-25 times more HCN than stems. New shoots from young, rapidly growing plants often contain high concentrations of prussic acid glycosides.



The cyanogenic glycoside potential of plants is increased due to heavy nitrate fertilization, especially in phosphorus-deficient soils. Ruminants are more susceptible than monogastric animals, and cattle slightly

more so than sheep. The clinical signs exhibited by acute cases are respiratory distress, restlessness, clonic convulsion, frothing at mouth, tympany and bright red conjunctiva. In less severe cases, staggering, salivation, dyspnea and tendency of recumbency are observed. Mucous membranes are bright red but may become cyanotic terminally. Death occurs during severe asphyxial convulsions. The whole syndrome usually does not exceed 30-45 min. The pathological findings are manifested as bright carcass, hemorrhage in intestine, epicardium and endocardium; kidney and liver congestion. A strong pungent bitter almond like foul smell is characteristic in ruminal contents. Specimens recommended for cyanide analyses include the suspected source (plant or otherwise), rumen or stomach contents, heparinized whole blood, liver, and muscle. Differential diagnoses include poisonings by nitrate or nitrite, urea, organophosphate, carbamate, chlorinated hydrocarbon pesticides.

The clinical cases can be successfully treated by prompt administration of sodium thiosulphate at the rate of 200 mg/kg body weight I.V., two times at 6 hr interval along with 4-6 g intraruminally. In preventive strategy, suspected feed should not be grazed. Animals should be fed before first turning out to pasture as hungry animals may consume forage too rapidly and is reported to be highest during early morning hours. Free-choice salt and mineral with added sulfur may help protect against prussic acid toxicity. Green chop forces livestock to eat both stems and leaves, thereby reducing problems caused by selective grazing. Sorghum hay and silage usually lose 50% of prussic acid content during curing and ensiling processes. Feeds should be analyzed before use whenever high prussic acid concentrations are suspected.

Medicinal Uses of Goat Milk



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Goat milk is unreservedly recommended to all and is not forbidden in disease due to the deranged action of

Vayu or Pittam or in ailments affecting the mind or the vascular system of the human being. Its beneficial and curative efficacy may be witnessed in cases of chronic fever, cough, dyspepsia, phthisis and other wasting diseases, Gulma (abdominal gland), insanity, ascites, epileptic fits, vertigo, delirium, burning sensation of the body, thirst, diseases affecting the heart and bladder, chlorosis and dysentery, piles, colic and obstinate,

constipation, Grahani, Pravalika, miscarriage and other diseases peculiar to the female reproductive organs and in haemoptysis. It is a refrigerant and act as beverage after physical exercise. It is sacred, constructive, tonic, spermatopietic rejuvenating and aphrodisiac. Goat milk is the most complete and wholesome diet for infants, old men and persons suffering from the cachexia, ulcer as well as for the persons debilitated from insufficient food, sexual excesses or excessive physical labour.

Sulphur has been found only in case of milk of goat. Traces of iodine have been also observed in the goat milk. Physiologically speaking these salts though present in very minute quantities play a very important part in resisting a number of diseases like T.B. and development of the tonsillitis. Goat milk used for the treatment of mal-absorption syndromes, intestinal disorders, coronary diseases, premature infant nutrition, and cystic fibrosis and because of its unique metabolic abilities in providing energy and at the same time lowering, inhibiting and dissolving cholesterol deposits. Goat milk exceeds cow milk in monounsaturated, polyunsaturated fatty acids

and medium chain triglycerides which are beneficial to human health, especially in cardiovascular condition. The fat globules are smaller in size and thus, more easily digestible.

Human milk oligosaccharides are beneficial to infants with regard to their prebiotic and anti-infective properties. However, so far no milk from farm animals is considered a natural source of lactose-derived oligosaccharides for human nutrition but a large amount and variety of acidic and neutral oligosaccharides are found in goat milk. In addition, 15 new oligosaccharide structures were identified in caprine milk therefore, the goat milk is a natural source of oligosaccharides for human nutrition due to its composition and concentration. Goats' milk has more oligosaccharides than cows' milk, with an amount similar to human milk. These act as prebiotics in the gut and may help to maintain the health of the digestive tract by encouraging the growth of beneficial gut bacteria and preventing the growth of harmful bacteria.

Fiber of Goats



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Pashmina or cashmere or mohair is the one of the finest, softest and solid texture fiber of goats. Angora goats produce the fiber called mohair, which is a silky fiber used in many products.

Cashmere, produced by the cashmere goats, is an even more exotic fiber and is in high demand. In India, at present goat fiber is known as Pashmina. These all type fibers come from the undercoat of the goats. The Angora goat was named after the region in Turkey from which it originated and was introduced into Australia from France in the early 1830s. South Africa is by far the largest mohair-producing nation, accounting for over sixty percent of the world's mohair clip. The cashmere, word derived from Kashmir and the pashmina word derived from Pashm which means "fiber" in Persian is a finer variant of the fiber. China is the largest world producer of cashmere with an annual production of 11,057 tonnes of raw cashmere in 2000. About 30% of the total production

comes from the Inner Mongolian population of 13 million cashmere goats that vary in production traits among individuals and flocks.

Cashmere is also produced in the United States, Europe and even in the Middle East. Cashmere goats are economically important animals in countries such as Iran, Iraq and Afghanistan. New Zealand noted for cashgora production by crossing of Angora goats with goats of cashmere. The temperate Himalayan region of North India has Changthangi, Gaddi and Chigu goats breed which are known as pashmina goats and produce an extremely fine fleece. Majority of goats in Ladakh were of the Pashmina type, of which the Changthangi is the most important breed. For the genetic improvement of fiber goat, a unit AICRP on Goats is started recently at Leh for high quality pashmina production.



Environmental Attributes to Goat Productivity



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The attempt to increase livestock products (meat, eggs and milk) output, has resulted in the production, accumulation and dumping of large amounts of different kinds of wastes or pollutants in the environment all over the world e.g. aerosolization of microbial pathogens, endotoxins, drug residues, pesticides, offensive odour, and dust particles; an inevitable consequences of the generation and handling of waste material of the food production process, originating from animals.

Environmental pollution today shares about 8–9% of the total disease burden, but the risk is higher in developing countries. Consequently, the lungs become a frequent dumping site for air borne pollutants such as heavy metals, pesticides, the particles of which may persist in the atmosphere as aerosol, fibres, fumes, mists, or dust. The pollution gains further significance in case of goats kept in overcrowded premises or in poor hygiene or ventilation.

The physical status of inhaled substance (solid, fume, or fusion), the particle dimension, and other physicochemical characteristics (like solubility) also play

a decisive role in establishment of the initial location of disease development. Conversely, many solid wastes pose little risk as long as they remain in their original form. The problem arises when their decomposition takes place, either because the decomposition products are inherently more toxic or because they show an increased accessibility to the respiratory system. Ventilation is often a managerial problem for indoor sheep and goat farming. High level of ammonia is a common finding in the indoor atmosphere of small ruminants which causes chronic dyspnoea, and clinical pictures consistent with restrictive lung dysfunction, obstructive lung disease, and bronchial hyper-reactivity. Combined effects of ammonia and bacterial endotoxins predispose the animals to respiratory infections with viruses and bacteria, both primary pathogenic as well as opportunistic species.

In addition to this, stress is one of the basic requirements for disease development. It can have numerous origins like environmental extremes e.g. cold, heat, physical exercise or malnutrition. Dust, transporting, weaning, handling, mingling with infected animals, overcrowding, dehorning and castration all add to the onset of disease. Therefore, lesser an animal is exposed to the stress factors, better probability that it will maintain an integral immune system to defend itself against infectious organisms and remain healthy to sustain a better productivity.

Assessment of Body Condition in Jakhrana Goats



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Body condition scoring (BCS) is an important practical tool for assessing body condition of the farm animals because it is the indicator of the fat reserves which can be used by the animal in the adverse conditions. BCS cannot be determined by simply looking at an animal; rather, the animal must be touched and felt. The lumbar area should be examined first followed by the sternum (breastbone) to assess the BCS. The scoring

was performed in goats of Jakhrana Unit of the Institute using a BCS ranging from 1.0 to 5.0 (5: excellent, 4: very good, 3: good, 2: average and 1: poor). A healthy/fit animal should have an optimum BCS (BCS of 4 & 3). A total of 206 Jakhrana goats (61 bucks and 145 does) were assessed for their overall body conditions by using BCS. Out of them, 1.94 % (4/206) goats showed BCS of 5 followed by 33 % (68/206) with BCS of 4, 62.13 % (128/206) with BCS of 3 and 2.91 % (6/206) with BCS of 2, respectively. Thus, the body condition score of majority of Jakhrana goats (n=95.13 %) was found optimum indicating the ideal managerial practices are being followed at the Jakhrana Unit of the Institute.

Road Map for Goat improvement in India



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Goat is the choice animal for under-privileged farmers and labourers due to lower capital investment & lower risk, quick return and adaptability to varying climate, feed and fodder. Goats have become driving force of livelihood and employment security of rural household and possess huge potential for export of its product. There are 24 goat breeds (<http://www.nbagr.res.in/regcoat.html>) which are contributing substantially with their multi-facet utility to meet out requirements of mankind in their habitat. Most of the goats are non-descript but has tremendous potential for improvement, as productivity of these goats are low and mainly attributed to low input based production system. Improvement programmes not yielding desired rate of progress due to inadequate data recording structure, lack of goat breeder's societies, limited adoption of technologies, indiscriminate breeding, scarcity of elite breeding bucks, low priority to goats in state owned livestock development programmes. Dilution leading to gradual extinction of many important breeds is another important issue.

Policy and Programmes

1. There is a necessity to launch region specific and well-structured grading up programmes with back up of sufficient number of breeding bucks of Improver breeds and prophylactic support.
2. Selective breeding in available breeds and up-graded goat population should be breeding approach and may be implemented through nucleus schemes. Trait(s) of local importance (adaptability, resistance, reproduction etc.) should be emphasized.
3. Establishment of nucleus farm of important goat breeds for regular supply of elite buck.
4. Clearly described breeding policy for each breed in every states/regions.
5. Capacity building of farmers for skill development and technology adoption in the area of breeding practices, vaccination, deworming, strategic feeding,



goat housing & sanitation and marketing.

6. Collection of data base of all important breeds in all regions along with animal and farmers identification number, production environment, marketing structure and prevailing farming systems and cropping pattern.
7. Availability of potential purebred bucks should be ensured for farmers and sale of high potential males for slaughter should be minimized by making awareness among farmers.
8. Transfer of Technology should be conducted through establishing farmer's groups/SHGs and some fund should be provided and generated to sustain such programme in future. Such groups should be periodically empowered (credit access, knowledge and incentives).
9. Formation of goat breeder's cooperative/ societies should be encouraged and initially technically and financially supported for data recording, breed conservation and creating awareness for technology adoption.
10. Feeding resources development at village level has become critical for goat rearing; therefore, available wasteland and community pastures should be improved and utilized with the emphasis on agroforestry. Minimum cost may be fixed from users for its productivity and maintenance.
11. An integrated package of management practices for livestock at village level should be transferred as most of goat keeper also keep other livestock species.
12. Banks including NABARD should make simple proforma and farmer-friendly procedure to give credit or loans to the farmers.
13. Vaccination against infectious diseases should be seriously implemented by state Animal Husbandry Departments and vaccines should be made available to goat keepers at least at district headquarter level.
14. Strengthening of goat marketing structures including Goat Marketing Information System (MIS) is necessary to enhance profit share to goat keepers.



Mesenchymal Stem Cells : An Emerging Paradigm in Cellular Therapy



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Mesenchymal stem cells (MSCs) are defined as multipotent, self-renewing progenitors that can be differentiated into adipocytes, chondrocytes, and osteocytes. Stem cells have the capacity to self-renew and to give rise to cells of various lineages. Thus, they represent an important paradigm of cell-based therapy for a variety of diseases. Broadly, the stem cells are embryonic and non-embryonic origin. Embryonic stem cells (ESCs) are derived from the inner cell mass of the blastocyst and can differentiate into cells of all three germ layers. However teratoma formation and ethical controversy hamper their research and clinical application. On the other hand, non-embryonic stem cells, particularly adult stem cells, are already somewhat specialized and have limited differentiation potential.

Embryonic stem cells and non-embryonic stem cells have all been explored as potential therapeutic strategies for a number of diseases. One type of adult stem cells, mesenchymal stem cells, has generated a great amount of interest in the field of regenerative medicine due to their unique biological properties.

Mesenchymal stem cells (MSCs), also referred to as connective tissue progenitor cells or multipotent mesenchymal stromal cells, have demonstrated significant potential for clinical use. This clinical utility is due to their convenient isolation, expansion with high efficiency, induced to differentiate to multiple lineages under defined culture conditions, lack of significant immunogenicity permitting allogeneic transplantation without immunosuppressive drugs, lack of ethical controversy, and potential to differentiate into tissue-specific cell types with trophic activity, to promote vascularization, and potent immuno-suppressive effects. Thus, MSCs have been the focus of a regime of emerging therapeutics to regenerate damaged tissue and treat inflammation resulting from cardiovascular disease and myocardial infarction (MI), treatment of lung fibrosis, brain and spinal cord injury, cartilage and bone injury, Crohn's disease, and graft-versus-host disease (GVHD) during bone marrow transplantation. Stem cell therapy involves the transplantation of autologous or allogeneic stem cells into patients, either through local delivery or systemic infusion. MSCs are tolerated in a xenogeneic environment while retaining their ability to be recruited to the injured myocardium and undergo differentiation to a cardiac phenotype. *In vivo* differentiation of MSCs to a skeletal muscle phenotype has also been demonstrated. They may be useful in the treatment of stroke, traumatic injury and Parkinson's diseases. Similar approaches have also been described for the repair of focal defects in articular cartilage and tendon. Thus, cellular therapy has evolved quickly over the last decade both at the level of *in vitro* and *in vivo* preclinical research and in clinical trials for treatment of diseases.

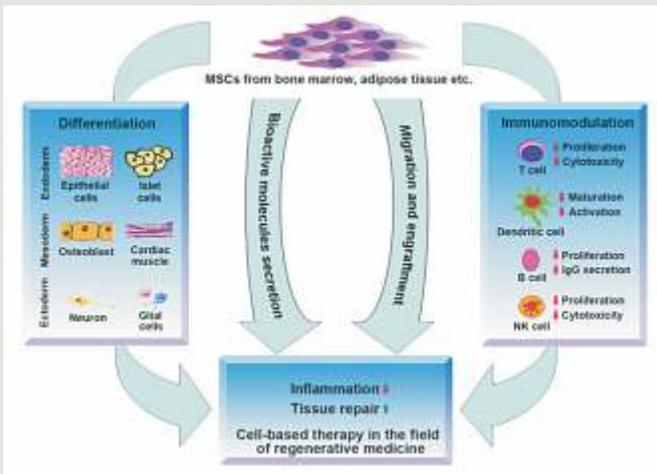


Figure. A schematic model demonstrating the biological properties of MSCs that are associated with their therapeutic effects. Source : <http://www.jhoonline.Org/content/5/1/19>.

Eco Day/ World Environment Day (WED) - June 5, 2015

The theme for year 2015 World Environment Day was *Seven Billion Dreams-One Planet- Consume with Care* and the host country was *Italy*, a country at the forefront of global action towards improved global nutrition and resource use. This year's WED focus is on the need to respect the carrying capacity of the planet and to manage natural resources efficiently.



Regional workshop of Animal Nutrition Society of India

Regional workshop of Animal Nutrition Society of India in collaboration with ICAR-Central Institute for Research Goats (ICAR-CIRG) was held on June 01, 2015 at CIRG, Makhdoom on the theme “Nutrition and feeding strategies for goats: linking climate resilient feeding and poverty alleviation”. Scientists and farmers from several parts of the country (Uttar Pradesh, Delhi, Haryana, Rajasthan, West-Bangal and Karnataka), students of UP Pandit Deen Dayal Upadhyay Pashu Chikitsa Vishwavidyalaya evam Go Anusandhan Sansthan, Mathura participated in the workshop. Dr. C.S. Prasad, Ex-Assistant Director General, ICAR, Ex-Vice-Chancellor of MAFSU, Maharashtra, Ex-Director-ICAR-National Institute of Animal Nutrition and Physiology, Bangalore and President, ANSI Animal Nutrition Society of India; Dr S.M.K. Naqvi, Director, ICAR-Central Sheep and Wool Research Institute, Avikanagar and Dr S.K. Agrawal, Director, ICAR-Central Institute for Research on Goats, Makhdoom graced the occasion. A farmers-Scientist interface session was also organised where Dr Tribhuvan Sharma, Professor and Director Extension, Rajasthan Veterinary and Animal University, Bikaner conducted the session in a way that resolved the problems of the goat farmers. The following were the outcomes of the presentations and discussions of the workshop. Due to the continuous development of resistance against the anthelmintics it is pertinent to utilise strategic feeding through higher supplementation of macro and micro nutrients to help the animals performance at their genetic potential. Supplementation guidelines for utilizing plant secondary metabolites against gastrointestinal pathogens should be formulated considering both intensive and semi-intensive rearing systems. The climatic conditions throughout the country should be considered for development of climate resilient feeding strategies. These feeding strategies should emphasize on high nutrient density ration, appropriate ration balancing, development of silvi-pasture systems and conservation of seasonal biomass. Factors responsible for optimum utilization of micronutrients and their combination should be studied and documented. The utilization of new micronutrients, along with their level of supplementation for maximizing immunity in present climate change scenario should be ascertain. Nutrient requirement for heat stress and immunity should be studied to develop the requirements in next five years. Prepare concentrate mixture with locally available feeds (home made) and provide 100-300 g /d/ animal for better growth and production depending on the body weight and growth rate of kids need to be popularised among farmers. Providing mineral mixture and salt to the animals are compulsory and type of rearing will be semi intensive so as to decrease energy expenditure on grazing and better utilization of nutrients for higher productivity. Cultivated fodders and tree leaves should be provided for economic feeding of goats. During scarcity period and rainy season, better planning for preserving the tree leaves and straw may be adopted for better productivity. Complete feed-block or TMR or balanced ration to be provided along with essential major and micro minerals for better productivity and extension activity of the Institute may be strengthened for effective and efficient communication of scientific technologies in the form of complete package of practices to the farmers.



Male Goat 'produces' Milk

A male goat yields milk at Adhiyapur village in Vaidpura area of Etawah district. The four-year-old goat was purchased by Udal Singh for breeding purpose. He made the discovery when he noticed a change in the physical structure of one of his goats three days ago. On the very first day itself, he was able to obtain 250 g of milk. "It's almost like a miracle. It gives milk and is also capable of reproduction.

Source : <http://timesofindia.indiatimes.com/city/kanpur/Male-goat-produces-milk-in-Kanpur/articleshow/47579026.cms>



Extension and Farmers Education Programs

Farmers' Training Organised

- 61st National Training Programme (10 days) on Scientific Goat Farming was organized from 3-12 February 2015. In this training programme 62 trainees from 14 states have actively participated.
- 62nd National Training Programme (10 days) on Scientific Goat Farming was organized from 21-30 May 2015. In this training programme 75 participants (1 women) from 12 states have participated.
- A 5 days training programme on Scientific Goat Farming from 05-09 January 2015, sponsored by ATMA, Madhubani, Bihar. In this training programme, 23 farmers and 2 farm women (total 25) have participated.
- A 5 days training programme on Scientific Goat Farming from 16-20 February 2015, sponsored by Department of Irrigation and Water Resources, Hathras, U.P. In this training programme 22 farmers and 3 farm women (total 25) have participated.
- A 5 days training programme on Scientific Goat Farming from 23-27 February 2015, sponsored by Department of Irrigation and Water Resources, Hathras, U.P. In this training programme 21 farmers and 4 farm women (total 25) have participated.
- A 5 days training programme on Scientific Goat Farming from 9-13 March 2015, sponsored by Department of Land Development and Water Resources, Behjoi, District-Sambhal, U.P. In this training programme 24 farmers have participated.
- A 5 days training programme on Scientific Goat Farming from 17-21 March 2015, sponsored by Department of Irrigation and Water Resources, Firozabad, U.P. In this training programme 49 farmers have participated.
- A 5 days training programme on Scientific Goat Farming from 6-10 April 2015, sponsored by Department of Irrigation and Water Resources, Aligarh, U.P. In this training programme 25 farmers have participated.
- A 5 days training programme on Scientific Goat Farming from 12-16 May 2015, sponsored by Department of Irrigation and Water Resources, Aligarh, U.P. In this training programme 25 farmers have participated.



Exhibition/KisanMela Participated

- ASC India Expo- 2015, from 3-6 February 2015 at NDRI, Karnal, Haryana.
- Brahad Pashudhan Evam Krishi Mela 2015 at DUVASU, Mathura, 19-21 February 2015.
- Purvi Chetriya Mela at CPRI Regional Center, Patna, Bihar, 19-21 February, 2015.
- 21st Sarson Vigyan Mela evam Pradarshni at Directorate of Rapseed –Mustard Research, Bharatpur, Rajasthan, 24-26 February 2015.
- Kisan Gyan Ganga Mela at Pragati Maidan, New Delhi, 26-28 February 2015.
- Uttar Chetriya Anchalik Krishi Mela sponsored by Directorate of Extension, agricultural Ministry, GoI, New Delhi at IVRI, Izatnagar, Bareilly, 17-20 March 2015.



Goat Rearing Under Weak Monsoon Condition:

ICAR-CIRG started extension activities in the adopted villages for the farmers' preparedness on weak monsoon-2015 as its late beginning and sluggish progress. The activities were planned for the month of June 2015. Accordingly, farmers-scientists interactions, field days and health camps were organised in Nagla Chandrabhan, Nagla Amra, Rawal and Girdharpur villages of Mathura district during 5th to 27th June 2015. Two hundred and four farmers (204) including 94 farm women have participated in these activities.



Goat Farmers' Awareness Programmes

AICRP on Goat Improvement Field Units Organized Training programme

All India Coordinated Research Project on Goat Improvement is located at ICAR-CIRG, Makhdoom and is operational at 18 locations across the country. One of the mandate of the project is to build capacities of stakeholders involved in goat production at root level. Therefore the capacity building programme is an ongoing activity. Recently six units have conducted 18 trainings cum awareness programmes for the stakeholders.

- Malabari Field Unit at University Goat and Sheep Farm, Mannuthy, Thrissur, Kerala. Fifty farmers were participated in the four trainings from 11-12 March, 25-26 March, 6-7 April and 17-18 June, 2015.
- Osmanabadi Goat Unit, Phaltan, Maharashtra from 3-6 June, 2015 in 'Vaccination and First-aid in goats and Data Collection Practices.
- Andaman Local Goat Field unit, ICAR-CIARI, Port Blair. One hundred seventy three farmers including sixty five women have participated in the four trainings on 31st Jan at New Bimblitan, South Andaman, 3rd Feb at Ranchi Basti, South Andaman, 5th Feb at Sippighat, South Andaman and 11th Feb at Calicut, South Andaman in 2015.
- Black Bengal Goat Unit at BAU, Ranchi, Jharkhand. Twenty four farmers have participated in the five day trainings from 9-13 March, 2015.
- Assam Hill Field Goat Unit, AAU, Buranihut. One hundred and sixty eight farmers have participated in the five trainings from 9-10 March, 10th April, 21st and 28th April, 6-9 June, 2015.
- Black Bengal Field Unit, West Bengal University of Animal & Fishery Sciences, Kolkata at Jhargram cluster, Lodhasuli of Bengal. Two hundred sixty four farmers mostly belonging to ST have participated in training on 7th Feb, 10th Feb and 22nd March, 2015.
- Surti Field Unit at Livestock Research Station, Navsari Agriculture University, Navsari, Gujarat on "Profitable goat farming through scientific interventions" from 4-8 May, 2015. Eleven farmers have participated.



Union Minister Appreciates *Moringa* feeding in Goats

Shri Giriraj Singh, Union Minister of State for Micro, Small and Medium enterprises visited Institute on 16th April 2015. Dr S. Ayappan, Secretary, Department of Agriculture Research and Education (Govt. of India) and Director General, ICAR, Dr K.M. L. Pathak, Deputy Director General (Animal Sciences), ICAR, alongwith Hon'ble Minister and Dignitaries visited institute livestock farms and interacted with Scientists. Dr U.B. Chaudhary, Head, Nutrition Feed Resources and Product Technology, presented the progress of the *Moringa oleifera* leaves feeding experiment. Minister appreciated the fodder value of *Moringa* in-view of nutrient composition and potentialities of health promoting effects. It was emphasized for the commensurable research on propagation, production and utilization of *Moringa* biomass in animal feeding in economizing cost of feeding and minimizing gap between the demand and supply of green fodder in the Country. Director General, ICAR and Deputy Director General (Animal Sciences) assured him for concerted efforts by ICAR on *Moringa* biomass production and utilization in improving animal productivity and profitability.



Spirulina platensis-supplement in goats



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Spirulina (*Arthrospira platensis*) is a blue-green micro-algae that is used as a food supplement for human. It is a source of protein (60-70% crude protein) of high biological value, vitamins (especially vitamin B12 and provitamin A), minerals (especially iron), and essential fatty acids, mostly C18:3n 6 (GLA). Spirulina is also a source of bioactive compounds such as β -carotene, phycocyanin and allophycocyanin with antioxidant activity, sulphated polysaccharides with antiviral properties, and sterols. Spirulina was supplemented @ 0.25 and 0.5% of dry matter intake in the growing barbari goats for ninety days of experimental feeding. No statistically significant effect on body weight gain and dry matter intake was reported. There was significant improvement in antioxidant enzymes (catalase and superoxide dismutase) level after spirulina supplementation in barbari goats. Total immunoglobulin concentration in serum and cell mediated immune response against PHA-p was get improved in the spirulina supplemented group as compared to control group of goats with no spirulina supplementation.



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