



ISSGPU NEWSLETTER

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A Publication of the
Indian Society for Sheep & Goat Production and Utilization

January, 2011

From the President's desk

Livestock are the lifeline for millions of small/marginal/landless farmers of our country and it is one of the fastest growing sub sector of Indian agriculture that contributes 27 % to Ag GDP and nearly 4.5 % to GDP. Sheep, goat and rabbits constitute an important group of livestock species for sustenance of rural poor. Rearing small ruminants has been traditionally in the hand of weaker segment of society and nomadic people.



The common property resource is the primary source of sustenance for small ruminant while migration pattern of grazing in range land, stubble grazing are still the prevalent rearing system. Yet, this efficient mechanism is increasingly challenged by mounting population pressure, appropriation of land and restricted trans boundary movements leading to various degrees of under nutrition and low productivity. At the same time herd of small ruminants is mobile hard cash ATM (Any time money) during adversity providing social security. Low output from this renewable livestock sector is a major impediment in socio-economic development of nomadic tribes. Enhancement of productivity in this sizeable transhumance and sedentary sheep/goat flock will certainly contribute to societal development and overall GDP in national economy.

The Indian Society for Sheep and Goat Production and Utilization (ISSGPU) has been at service for uplift of socio-economic scenario of people involved in this livestock sub-sector. Organization of seminars, symposia and interactive meetings are being conducted by ISSGPU highlighting several issues pertaining to increasing the productivity of small ruminants in the national perspectives. Central Sheep and Wool Research Institute, Avikanagar is celebrating its Golden Jubilee Year starting from 04 January, 2011 and I hope the ongoing activities during this Golden Year will expand to establish its national curriculum and to insight upon productivity augmentation and overall contribution to national GDP. The ISSGPU will continue to serve the nation in taking up new paradigms to fulfill Nation's VISION-2030.

Jai Hind!

S.A. Karim

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Published By:

ISSGPU, CSWRI
Avikanagar 304501
Via: Jaipur (Rajasthan)



QRT meeting at CSWRI, Avikanagar



RAC at CSWRI, Avikanagar



IRC at CSWRI, Avikanagar



Afgan Delegates visiting Fodder Farm

DAIRY SHEEP: A PROSPECTIVE VENTURE TO EARN MORE RETURN

In India, sheep are generally meant for mutton and wool production. The competition of 'Dairy' and 'Goat Husbandry' put forward challenges to sheep farmers due to diminishing demand/return from wool production. Dairy sheep concept will put forward definitive return from milk production besides meeting the challenges of pre-weaning nutrition to twin/triplets birth from prolific mother. This will further the scope of enhancing mutton production in a calendar year and fetch more return to sheep farmers. Sheep thrive on marginal land (also can harvest its feed requirement from pasture/grass post grazed by cattle) with minimal feed supplements, and can provide a triple income from wool, meat and milk. Ultimately, sheep husbandry can become more profitable and it will recognise sheep as a 'Triple-purpose-Breed' in years to come. Some of the promising dairy breeds of sheep are East-Friesian (Germany), Awassi, Assaf (Israel), Lacaune (France), Chios (Greece), Manchega (Spain), Sarda (Italy), British Milk sheep (UK), Dorset, Polypay, Rideau Arcott (USA), and Dumba, Patanwadi, Marwari (India).

Contributed by: A. Sahoo, CSWRI, Avikanagar

COMPARATIVE ASSESSMENT OF CATTLE, SHEEP AND GOAT MILK

Sheep milk is highly nutritious, richer in fat, protein, vitamins A, B, and E, calcium, phosphorus, potassium, magnesium, iron and zinc than cow's milk (Table). It has smaller fat globules and twice non-casein protein than that of cow or goat milk thus more digestible. It contains a higher proportion of short- and medium-chain fatty acids, which have recognized health benefits and also have more conjugated linoleic acid (CLA) than the milk from goats, cattle and humans. It has lower lactose content than human milk, thus making it more suitable for child having lactose intolerance. Sheep milk has higher total solids content than goat or cow milk and thus yields more cheese, e.g. 18-25% cheese from sheep milk compared to 9-10% goat and cow milk. Cheese made from sheep's milk is creamier and ages more mildly than goat's or cow's milk cheese, and has its own special flavor, texture and aroma. Sheep's milk keeps well, and unlike goat's or cow's milk, it can be stored frozen without any loss of quality.



Comparative compositional differences in sheep, goat, cow and human milk

Constituents	Sheep	Goat	Cow	Human
Total solids%	19.30	12.97	12.01	12.50
Ash%	0.90	0.80	0.70	0.20
Fat%	7.00	4.14	3.34	4.38
Protein%	5.98	3.56	3.29	1.03
Lactose%	5.10	4.40	4.80	6.90
Poly-unsaturated fatty acids (mg)	300	100	100	140
Cholesterol (mg)	10.8	10.2	14.1	11.2
Calcium (mg)	193	134	119	32
Calories (Kcal)	108.0	69.0	69.0	70.0

Contributed by: A. Sahoo, CSWRI, Avikanagar

DORPER LAMBS PRODUCED THROUGH EMBRYO TRANSFER

One hundred and forty eight Dorper lambs were produced through embryo transfer at Siddharth Farms, Bangalore. The embryos were imported and successfully transplanted in estrus synchronised Rambouillet crossbred and Munjal sheep brought from Haryana.

A total of 253 embryos were transfer using laparoscope techniques during 25 to 27 November, 2010. Pregnancy diagnosis confirmed conception in 63% ewes and 58% lambing rate was achieved. For details you may contact Mr. Ravi, SIDDHARTH FARMS, Bangalore- 560083, Email: siddharthfarms@gmail.com. Earlier to this Asda Farms, Anantpur (Andhra Pradesh) has also produced a large number of Dorper lambs.



Courtesy Siddhartha Farms, Bangalore

The Dorper breed was developed in the 1930's in South Africa through the crossing of Blackhead Persian ewe with Dorset Horn. This breed is well adapted to arid/semi-arid condition with no seasonality in their reproduction. It is known for its exceptional adaptability, hardiness, reproduction rates and growth as well as good mothering abilities.



Contributed by: S.M.K. Naqvi, CSWRI, Avikanagar

TWIN IVF KIDS PRODUCED AT CIRG, MAKHDOOM

Scientists of Central Institute for Research on Goats, Makhdoom have successfully produced twin *in vitro* fertilized (IVF) male and female goat kids. CIRG is a premier research Institute under the aegis of Indian Council of Agricultural Research which works at the interface of scientific livestock rearing and alleviation of poverty using modern goat production technologies and animal husbandry practices. Dr. Devendra Swarup, Director, CIRG Makhdoom named the IVF kids so produced as "**Ajat and Ajati**". The credit of this research success goes to a team of scientists comprising Dr. S.D. Kharche (CCPI), Dr. A.K. Goel & Dr. S.K. Jindal who achieved success to establish pregnancy in goats using IVF technique under the guidance of Dr. Devendra Swarup, Director of the Institute. Team was working under a World Bank Assisted NAIP on "Developmental Potency of Parthenogenetic Goat Embryos". This is second success in producing IVF kids at this Institute. The project is aimed at investigating the developmental potency of



parthenogenetic (embryos produced without the involvement of male), *in vivo* and *in vitro* produced embryos following transfer into surrogate mother. Goat oocytes used in this technique were collected by follicle puncture method from the ovaries brought from an abattoir located at Agra. Recovered oocytes were subsequently cultured in a special defined medium in a CO₂ incubator. Matured oocytes were then co-incubated and fertilized *in vitro*. Fertilized oocytes were further allowed to grow in defined culture medium with oviductal epithelial cells in a CO₂ incubator and then finally transferred into surrogate goat of Sirohi breed through surgical technique.

Following transfer, pregnancy was initially confirmed at day 35 and subsequently at day 65 by ultrasonography.

On 3rd November, 2010, this surrogate goat of Sirohi breed normally kidded with a twin (male weighing 2.4 kg; female weighing 2.6 kg) after 142 days following transfer. The weight of surrogate



goat after parturition was 30 kg. Both the kids were healthy. IVF technique will go a long way for improvement & conservation of goat breeds of India and has opened new vistas for application of biotechnological tools for production of biopharmaceuticals through transgenic technology. The technique has applications in faster propagation of the genetic merit of the elite females and also to use non-descript goats as

foster mothers for production of kids of superior genetic merit. This particular achievement is a step towards the high quality research output of the Institute in the area of Reproductive Biotechnology. The IVF technology came into being in the 1950s, however, not much success in India was achieved in this technology until mid 90's and the technology could be successfully implemented in goats by this Institute in 2006. This success of CIRG in the area of IVF will go a long way in formulating strategies to conserve endangered indigenous breeds as well as elite germplasm of goats available in the country. CIRG is contributing to high quality research output in the area of caprine ethology, genetics, health, production and reproduction. It is committed to enhance the economic status of small farmers and to ensure their livelihood and food security. The emphasis has been on the use of multidisciplinary and interdisciplinary approaches to improve eco-efficient rearing of goats and making goat farming a vibrant and viable Enterprise, besides popularizing goat produce by value addition and making them attractive for industrial applications. The work has been possible due to the support and guidance of Dr. S.Ayyappan, Director General and Secretary DARE, Dr. K.M.L.Pathak, DDG (Animal Science) and Dr. Bengali Babu, National Coordinator, NAIP and authorities of SMD and NAIP of Indian Council of Agricultural Research, Ministry of Agriculture, Government of India. Dr. Devendra Swarup, Director of the Institute congratulated the team of scientists and assured all possible assistance in their future endeavors and expressed hope that such achievements will go a long way in furthering of the objectives of the Institute and in improving the sustainability of goat production system.

Contributed by: CIRG, Makhdoom

STUDY SHOWS WELSH SHEEP 'MORE CLEVER THAN THOUGHT'

Sheep aren't viewed as the cleverest of creatures, but new research has found they might be a lot more intelligent than previously thought. Scientists at the University of Cambridge found that Welsh mountain sheep can map their surroundings, and may even be able to plan ahead. The discovery shows they have the brainpower equal to rodents, monkeys and, in some tests, even humans. The study was part of wider research into



Huntington's disease in which attempt was done to use sheep as an animal model for examining Huntington's disease (HD). The disease, which is genetically inherited, affects muscle co-ordination, often causing involuntary writhing movements called chorea, and it leads to cognitive decline. It currently affects at least 6,700 people in England and Wales. Trials have also been conducted to test the spatial memory of sheep and found that they are able to navigate by forming memories of their surrounding environments. Research at the Babraham Institute in Cambridge has also shown that sheep have the ability to recall human faces and react to different facial expressions. They can also recognize other sheep by their facial features.



Contributed by: Rajni Kumari, Basanti Jyotsana, Amar Singh Meena and L.L.L.Prince, CSWRI, Avikanagar

URL: <http://www.telegraph.co.uk/science/science-news/8335465/Sheep-are-far-smarter-than-previously-thought.html>

SHEEP HAPMAP

"HapMap" (short for "haplotype mapping") studies, in which a large number of members of a given species are genotyped for a large number of single nucleotide polymorphisms (SNP), have produced a great deal of genetic information. Using the information in the HapMap, researchers are able to find genes that affect health, disease, and individual responses to medications and environmental factors. A Sheep HapMap project has recently been proposed by the International Sheep Genomics Consortium, Australia, aimed to improve productivity and product quality for wool fibre and meat, improve reproduction and better

host resistance to parasites. Stakeholders in global sheep production are being requested to submit samples of DNA from at least 24 sheep to undergo genotyping using a 60,000 SNP array. The full set of genotypic data obtained under this contract was released for public analysis in March 2009 via the International Sheep Genomics Consortium website (www.sheephapmap.org) including the genotypic data from the 100 African animals as part of the HapMap Breedv1 data release. The full dataset contains information from over 2800 animals implying it is a large dataset and consists of > 140 million genotypic data points. To allow researchers world-wide access, the data was formatted and released as .PED and .MAP files which can be analysed using the program PLINK (<http://pngu.mgh.harvard.edu/~purcell/plink/index.shtml>) which is designed specifically for large SNP datasets and is freely available.

Contributed by: V. Sejian, CSWRI, Avikanagar

STRONG IMMUNE RESPONSE INVERSELY CORRELATED WITH SHEEP'S FERTILITY

A Study conducted at Princeton University concluded that Strong immunity may play a key role in determining long life, but may do so at the expense of reduced fertility. This study gives a new insight into immunoheterogeneity in animal population. Study partially explains why hasn't natural selection weeded out weak immune systems? Because this tradeoffs in the immune system as a balance that maximizes reproductive performance.

Contributed by: Rajni Kumari, Amar Singh Meena and L.L.L.Prince, CSWRI, Avikanagar

SHEEP NEWS & INFORMATIONS

Dog born to a sheep (Daily Mail, 30 march, 2011)
Baa, baa, black... dog? Sheep gives birth to 'pup' (AhmedabadMirror.com, 05 April, 2011)

Shaanxi Province, China farmer Liu Naiying said that one of his sheep has given birth to a dog?

Mr. Liu told how he found the unusual baby animal shortly after it was born in one of his fields. "I was herding the sheep, and saw a sheep licking her newborn lamb on the grassland. The lamb was still wet. When I went up close to check on the lamb I was shocked because it looked so weird, like a



cross between a sheep and a dog. I was a bit frightened, as I've been raising sheep for 20 years and had never seen such a creature."

Yue Guozhang, a researcher at Xi'an City Animal Husbandry Technology Centre, said sheep and dogs were different species. It's not possible that a sheep could become pregnant with a puppy. It's likely that this is just an abnormal lamb.

Actually, it looks like a normal, fuzzy-furred young canid that was found born near sheep. Often times, herding dogs give birth to their young among sheep, so their new born are familiar with the smell of their wards from the beginning.

<http://www.dailymail.co.uk/sciencetech/article-1369977/Sheep-gives-birth-dog-Chinese-farm-Ewe-got-kidding.html>

<http://www.ahmedabadmirror.com/article/5/2011040520110405015501301d8727210/Baa-baa-black-dog-Sheep-gives-birth-to-%E2%80%98pup%E2%80%99.html>

'Stall-feeding a success' (The Hindu, 04 June 2011)

Assistant Director of the City Veterinary Hospital (Mysore), Dr Suresh, said that sheep rearing in the district had been rewarding for farmers in the unorganised sector supplementing their income in Nanjangud, K.R. Nagar, Mysore, T. Narsipur and Hunsur taluks. Sheep and goat rearing had been on the rise in the State, particularly in Mysore, after the stall-feeding system got encouragement from the Government. Stall-fed animals were reared at home under sheds without actually being let out for grazing. Industrial houses had also evinced interest in sheep and goat rearing as it had turned out to be a lucrative venture these days. The National Bank for Agriculture and

Rural Development (NABARD) provided loans up to Rs. 40 lakh for rearing a herd of 500 sheep or goats, of which 25 per cent would be subsidised, Dr. Suresh added.

URL:<http://www.thehindu.com/2011/06/04/stories/2011060461020300.htm>

'Down-under digestive microbes could help lower methane gas from livestock' (Science Daily, 30 June 2011)

Mark Morrison, Professor of animal sciences at Ohio State University, Science leader, Metagenomics, Division of Livestock Industries, CSIRO, Brisbane, Australia.

Tammar Wallaby (*Macropus eugenii*) Wallabies and other marsupials (mammals like the kangaroo that develop their offspring in a pouch) are dependent on microbes to support their digestive system, similar to livestock such as cows, sheep and goats, but Tammar wallabies are known to release about 80 percent less methane gas per unit of digestible energy intake than do livestock animals.

Scientists have used DNA sequence data to devise a way to isolate and grow cultures of a dominant bacterial species from the Australian Tammar wallaby gut and test its characteristics. The analysis confirmed that this bacterium would contribute to a digestion process that produces low levels of methane. Using this information, scientists hope to devise a way to augment the microbial mix in livestock animals' digestive systems and therefore reduce their methane emissions. An added bonus for the wallabies, the researchers say, is that the presence of this bacterium frees up more digestible energy for nutritional purposes in host animals. Early research in this area showed that methane emissions from Tammar wallabies amount to 1 to 2 percent of their digestible energy intake, compared to methane emissions of roughly 10 percent of digestible energy intake in sheep. In addition, marsupial and ruminant gut anatomies differ, which influences how quickly food moves through the digestive system.

Journal Science, appears online as a Science Express report on June 30, 2011.

<http://www.sciencedaily.com/releases/2011/06/110630142841.htm>

(Ref. P. B. Pope, W. Smith, S. E. Denman, S. G. Tringe, K. Barry, P. Hugenholtz, C. S. Mcsweeney, A. C. Mchardy, M.



Morrison. Isolation of Succinivibrionaceae Implicated in Low Methane Emissions from Tammar Wallabies. *Science*, 2011; DOI: 10.1126/science.1205760)

Methane gas from cows: the proof is in the feces (Science Daily, 7 June 2011)

Principal investigator, Dr Ian Bull, Bristol's School of Chemistry; Co-author, Dr Fiona Gill (Postdoctoral researcher at Bristol), University of Leeds Researchers from the University of Bristol and the Teagasc Animal and Grassland Research Centre in Ireland, have found a link between methane production and levels of a compound called archaeol in the feces of several fore-gut fermenting animals including cows, sheep and deer.

Archaeol is thought to come from organisms called archaea, which are symbiotic or 'friendly' microbes that live in the foregut of ruminant animals. These microbes produce methane as a by-product of their metabolism and this is then released by the animal as burping and flatulence. The compound could potentially be developed as a biomarker to estimate the methane

production from domestic and wild animals, allowing scientists to more accurately assess the contribution that ruminants make to global greenhouse gas emissions.

<http://www.sciencedaily.com/releases/2011/06/110606112822.htm>

(Ref. F.L. Gill, R.J. Dewhurst, R.P. Evershed, E. McGeough, P. O'Kiely, R.D. Pancost, I.D. Bull. Analysis of archaeal ether lipids in bovine faeces. *Animal Feed Science and Technology*, 2011; DOI: 10.1016/j.anifeeds.2011.04.006)

Compiled by: A. Sahoo, CSWRI, Avikanagar

A 14 day national training programme sponsored by NAIP-ICAR on **"Carbon sequestration, carbon trading and climate change"** is to be organized by CSWRI, Avikanagar. **Dr. John Gaughan**, School of Agriculture and Food Science, The University of Queensland, Gatton-4343, Australia, will be the international faculty with **Dr. Veerasamy Sejian**, Scientist, Division of Physiology and Biochemistry as course director. The training dates are between **14th November to 27th November, 2011**. Interested participants can send the application through proper channel on or before **1st September, 2011**. Application and other details of the training program can be found at www.cswri.res.in

Farmer's Query window will be available online (www.issgpu.org) to all life members for submitting queries which will be answered by concerned persons for the help of all life members and livestock farmers. It is also requested to all members to submit queries on behalf of livestock farmers for extending sheep and goat production in the country under the banner ISSGPU.



Chief Guest, S.C. Gupta, ADG (AP&B) tagging the BEST ANIMAL in The Kishan Mela



Director, CSWRI explaining to Chief Guest about Farmers' Participation in the Kishan mela



Field Day under TOT activities of the Institute



Training to Farmers under HRD Programme



Chief Guest, S.C. Gupta, ADG (AP&B) addressing the gathering on the eve of Golden Jubilee Event of CSWRI, Avikanagar



Shepherds with his flock: The Livelihood & Economic Backbone

BIBLIOGRAPHIC DATABASES OF CABI INDEXING INDIAN JOURNAL OF SMALL RUMINANTS

(Print I.S.S.N. 0971-9857: Online I.S.S.N. 0973-9718)

CAB Abstracts, Global Health, Index Veterinarius, AgBiotech News and Information, AgBiotechNet, Animal Science Database, Environmental Impact, Forest Science Database, Nutrition and Food Sciences Database, VetMed Resource, Agricultural Economics Database, Agroforestry Abstracts, Animal Breeding Abstracts, Forest Products Abstracts, Forestry Abstracts, Grasslands and Forage Abstracts, Helminthological Abstracts, Nutrition Abstracts and Reviews Series A: Human and Experimental, Nutrition Abstracts and Reviews Series B: Livestock Feeds and Feeding, Parasitology Database, Protozoological Abstracts, Review of Medical and Veterinary Entomology, Review of Medical and Veterinary Mycology, Rural Development Abstracts, Tropag & Rural, Veterinary Bulletin, Veterinary Science Database, World Agricultural Economics and Rural Sociology Abstracts.

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Request to all life members

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