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Project Director (DKMA) : Dr Rameshwar Singh

Compilation and Technical Editing : Hans Raj
Information Systems Officer
V.S. Kaushik
Chief Technical Officer

Indexing Assistance : Charu Mishra
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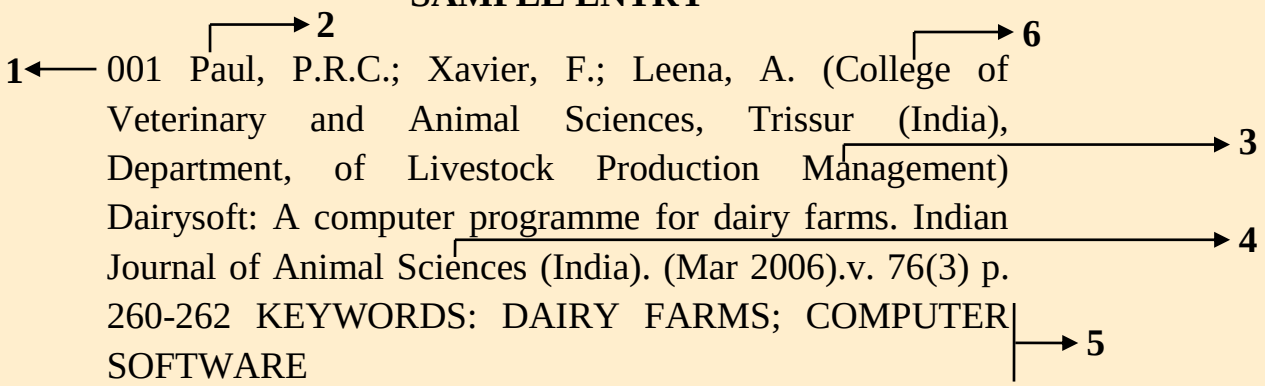
SAMPLE ENTRY



001 Paul, P.R.C.; Xavier, F.; Leena, A. (College of Veterinary and Animal Sciences, Trissur (India), Department, of Livestock Production Management) Dairysoft: A computer programme for dairy farms. Indian Journal of Animal Sciences (India). (Mar 2006).v. 76(3) p. 260-262 KEYWORDS: DAIRY FARMS; COMPUTER SOFTWARE

To exploit the full potential of dairy sector, a computerizd record management system dairysoft was developed. Visual Basis 6.0 was used as front end while MSAccess 97 was utilized as back end for the software. The menu base dairysoft was provided with facilities for obtaining necessary reports along with separate data entry options.

1. Entry number
2. Author(s)
3. Title in English
4. Source
5. Keywords
6. Organisation where work was carried out

C10 Education

001. Chandrasekhar, Leena; Kerala Veterinary and Animal Sciences University, Pookot (India). Maya, S.; Kerala Veterinary and Animal Sciences University, Pookot (India). Rajani, C.V.; Kerala Veterinary and Animal Sciences University, Pookot (India). Raja, T.V.; Kerala Veterinary and Animal Sciences University, Pookot (India). Ravindran, Reghu; Kerala Veterinary and Animal Sciences University, Pookot (India). Clay modeling –A method of teaching embryology to veterinary undergraduates. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1121-1123 KEYWORDS: TEACHING. TEACHING MATERIALS. TEACHING METHODS. VETERINARIANS.

Conceptualization of organogenesis is a difficult task for veterinary undergraduate students. In the present study, the traditional teaching method of veterinary embryology is subjected to a slight renovation. There is active involvement and integration of theory and practice, in which student teams prepare clay models of organogenesis under teacher supervision followed by a test during which learner’s skills were verified. A survey of the differences experienced by the students taught by conventional methods and clay models was conducted and statistically analyzed. The results showed strongly positive response for teaching with the help of models.

C20 Extension

002. Meena, M.L.; Central Arid Zone Research Institute, Pali-Marwar (India). Krishi Vigyan Kendra. Singh, Dheeraj; Central Arid Zone Research Institute, Pali-Marwar (India). Krishi Vigyan Kendra. Adoption level of sheep farming practices by the farmers in arid zone of Rajasthan. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 157-159 KEYWORDS: SHEEP. ANIMAL HUSBANDRY METHODS. INNOVATION ADOPTION. RAJASTHAN.

A study was conducted among the140 goat farmers of Namakkal district of Tamil Nadu with the objective of identifying gender-wise division of labour and decision making in goat farming. The study revealed that women were mainly involved in routine activities like feeding, watering, grazing, cleaning and care of young ones. But joint activities and decision making were high in sale of animals, credit acquisition and use and income spending.

003. Sakthivel, K.M.; Veterinary College and Research Institute,

Namakkal (India). Department of Veterinary and Animal Husbandry, Extension. Narmatha, N.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry, Extension. Uma, V.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry, Extension Akila, N.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry, Extension. Gender division of labour and decision making in goat farming in Tamil Nadu. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 160-162 KEYWORDS: GOATS. ANIMAL HUSBANDRY. ROLE OF WOMEN. GENDER. DECISION MAKING. TAMIL NADU.

A study was conducted among the140 goat farmers of Namakkal district of Tamil Nadu with the objective of identifying gender-wise division of labour and decision making in goat farming. The study revealed that women were mainly involved in routine activities like feeding, watering, grazing, cleaning and care of young ones. But joint activities and decision making were high in sale of animals, credit acquisition and use and income spending.

004. Mohanasundarraj, G.B.; Indian Veterinary Research Institute, Izatnagar (India). Division of Extension Education. Tripathi, Hema; Indian Veterinary Research Institute, Izatnagar (India). Division of Extension Education. Knowledge level of the goat farmers and effectiveness of special livestock protection scheme in erode district of Tamil Nadu. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 244-249 KEYWORDS: GOATS. FARMERS. EXTENSION ACTIVITIES. LEARNING. TAMIL NADU.

This paper focuses the lessons, successes, and perceived effectiveness of Special Livestock Protection Scheme gained through its veterinary services on improvement of goat health, production and socio-economic conditions of the goat farmers of Erode district in Tamil Nadu. Atotal 120 goat farmers were drawn from four remote villages of plain and hilly areas. The data from the respondents were collected through the specially designed and pre- tested interview schedule. The study revealed that the majority of farmers selected had medium level of knowledge in various aspects of goat farming. The knowledge level among farmers in plain areas was medium followed by high except for breeding practices, which was medium to low. The knowledge level among farmers in hilly areas was however, towards medium to low in all aspects. Majority of the farmers perceived that services under the scheme could improve the conception rate

in their flock and general health status of animals. Fifty-five per cent respondents reported increase in flock size and 37.5% improved the extension contact and knowledge in goat farming due to the services under the scheme. Positive and significant (P0.01) relationship was found between education, extension contact, information seeking behavior, knowledge level in goat farming and income from goat farming with the overall effectiveness of scheme.

005. Kumar, Vijay; Central Institute for Research on Goats, Makhdoom (India). Extension Education and Socio-Economics Section. Singh, K.; Central Institute for Research on Goats, Makhdoom (India). Extension Education and Socio-Economics Section. Dixit, A.K.; Central Institute for Research on Goats, Makhdoom (India). Extension Education and Socio-Economics SectionBraj, Mohan; Central Institute for Research on Goats, Makhdoom (India). Extension Education and Socio-Economics Section. Awareness among goat keepers about cirg helpline service. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 250-252 KEYWORDS: GOATS. FARMERS. EXTENSION ACTIVITIES. PROFESSIONAL SERVICES. DIFFUSION OF INFORMATION. TECHNOLOGY TRANSFER. AGRICULTURAL EXTENSION.
Goat rearing is an important source of livelihood for many rural people in India. Central Institute for Research on Goats, Makhdoom established telephonic helpline service to solve their problems timely. During the year 2009–10, 1150 calls were received from 217 districts of 22 states. Nearly half of the calls were received from Uttar Pradesh followed by Bihar and Madhya Pradesh. July and August months were the more busy months compared to others. There was no significant difference in number of monthly calls from October 2009 to March 2010. Majority of the callers were men. Around 57% callers sought for training related information and 9.57% called for disease related information. Timely and relevant technical information in goat husbandry was provided through CIRG helpline service.

006. Verma, R.K.; Krishi Vigyan Kendra, Jhunjhunu (India). Sharma, N.K.; Shri Karan Narendra College of Agriculture, Jobner (India). Department of Extension Education. Seikh, A.S.; SDAU, Sardar Krushi Nagar (India). Veterinary College, Department of Extension. Adoption of improved sheep production technologies in arid western plain zone of Rajasthan. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 225-230 KEYWORDS: SHEEP. ANIMAL BREEDING. TECHNOLOGY TRANSFER. INNOVATION

ADOPTION. EXTENSION ACTIVITIES. RAJASTHAN.
The study was conducted in arid western plain zone of Rajasthan. A total of 240 sheep farmers constituted small, medium and large flocks were selected for the study purpose. Results indicated that more than half of the respondents possessed medium level of adoption. They had higher adoption about improved feeding technologies followed by management and breeds and breeding technologies. There also existed a significant difference with regard to adoption levels of small, medium and large sheep farmers.

007. Varathan, B. Jaya; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Prabu, M.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Pandian, A. Serma Saravana; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Senthil, Kumar G.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Selva, Kumar K.N.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Factors influencing the perception of constraints by self help group members and non-members in livestock farming. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 276-279 KEYWORDS: ANIMAL PRODUCTION. FARMS. SELF HELP. CONSTRAINTS.
A study was carried out in Tiruvannamalai district of Tamil Nadu to assess the constraints faced by women SHG members and non-members in rearing livestock and to identify and analyze the factors influencing the constraint intensity. A detailed questionnaire concerning various aspects of livestock rearing and the commonly occurring constraints in livestock rearing were enlisted under five different categories viz., production, marketing, social, economical and political. The women livestock farmers from SHG members and non-members in the study area were asked to give the scores for each constraint which affected their performance in rearing livestock and the cumulative constraint score was arrived out. Multiple linear regression analysis was carried out on this cumulative score to identify the factors influencing the perception of constraint intensity. The results showed that age and livestock income were positively associated with the perception of constraint intensity whereas, the level of education and total income were negatively associated. The result portrays the responsibility of education in livestock farming. Hence, programmes focused towards education should be implemented at its highest point so that the farmer is in a position to successfully absorb

and make use of the information he received through training programmes. The result also clearly dwells upon the fact that membership in self help group did not make the farmers insulated from perceiving the severity of constraints in livestock rearing. Decision makers at the policy level should realize this reality and reach practical conclusions thereby the sustainability of the Self Help Group Programme is may be well ensured.

008. Akila, N.; Veterinary University Training and Research Centre, Karur (India). Chander, Mahesh; Indian Veterinary Research Institute, Izatnagar (India). Training needs of farmers in draught animal management and utilization. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 280-283 KEYWORDS: DRAUGHT ANIMALS. ANIMAL HUSBANDRY METHODS. EMPOWERMENT. TRAINING.
The training needs of the bullock owners was studied in the state of Tamil Nadu with 210 respondents of 70 small, 70 medium and 70 large farmers. The results revealed that majority of the farmers in all categories (59.69 per cent small farmers, 69.24 per cent medium farmers and 69.18 per cent large farmers) didn’t show any desire in getting training on draught animal utilization and management. Out of the seven areas of training needs, the farmers felt, they need training in the use of new animal drawn implements 54.64 per cent small farmers, 46.43 per cent medium farmers and 32.14 large farmers felt as most needed). The extent of training need revealed that majority of the small farmers (70 per cent), medium farmers (67.14 per cent), and large farmers (51.43 per cent) had low training need. Among the farmers there was no significant difference and there is significant difference (P0.01) among the different areas of training needs.

009. George, P. Reeja; College of Veterinary and Animal Sciences, Wayanad (India). Dinesh, C.N.; College of Veterinary and Animal Sciences, Wayanad (India). Rehna, Hassan; College of Veterinary and Animal Sciences, Wayanad (India). Simon, Shibu; College of Veterinary and Animal Sciences, Wayanad (India). Knowledge level of farm women of Wayanad district, Kerala, about rabbit rearing. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 292-294 KEYWORDS: RABBITS. REARING TECHNIQUES. FARMERS. WOMEN. KERALA. RABBITS. REARING TECHNIQUES. FARMERS. WOMEN. KERALA.
A study was conducted in Wayanad district of Kerala on the knowledge of farmwomen about rabbit rearing.

Proportionate stratified random sampling was used to select 34 farm women who had been selected for loans to set up rabbit units in 2006 under the State Poverty Eradication Programme from the three taluks. Knowledge of rabbit farming was assessed by preparing an arbitrary knowledge test containing 26 items. It was found that most of the women had good knowledge regarding breeds and housing. But fewer women had correct knowledge about breeding, feeding and management of rabbits.

E20 Organization, administration and management of agricultural enterprises or farms

010. Devendran, P.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Genetics and Breeding. Kandasamy, N.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Genetics and Breeding. Panneerselvam, S.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Genetics and Breeding. Selvam, S.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Genetics and Breeding. Economics of coimbatore sheep rearing. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 239-243 KEYWORDS: SHEEP. ANIMAL HUSBANDRY. ECONOMICS. TAMIL NADU.

A survey was conducted in 93 flocks of Coimbatore sheep in the breeding and migratory tracts to assess the socio-economic status of the flock owners and economics of rearing them. Data on household size, sex ratio, literacy and agricultural land holdings of owners as well as the fixed and variable costs and returns on different aspects were collected. The survey revealed that the Coimbatore sheep were owned almost exclusively by Kurumba/Kuruba community residing in Coimbatore and Dindigul districts of Tamil Nadu. The flock owners were mostly (90%) landless and among those who owned land, the average holding size was 5.29 acres of mostly dry land. The average household size of the flock owners, male: female ratio and literacy rate were 4.4, 1:0.87 and 54.34%, respectively. The families remained in the villages and did not move with the flock. Moreover, a single flock owner with more than one flock (27.1%) and more than one flock owner for a flock (33.3%) had been observed. Marketing of animals was unorganized involving middlemen and commission agents. The sale of surplus lambs at the age of two months was the major source of returns followed by sale of adults which contributed respectively 64.32 and 20.32% of total returns. Penning charges paid by

the land owners during migration and sale of wool also added to the returns by 14.42 and 0.94%, respectively. The cost of rearing Coimbatore sheep was accounted through wages (57.64%) and food (33.67%) to shepherds, veterinary care (6.83%) and transport between migrating places (1.86%). The estimated overall average annual net return was Rs. 412 per adult sheep.

E70 Trade, marketing and distribution

011. Biswal, A.; Indian Veterinary Research Institute, Izatnagar (India). Sanjay Kumar; Indian Veterinary Research Institute, Izatnagar (India). Factors affecting market price of cattle and buffalo in Odisha. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1189-1190 KEYWORDS: CATTLE. MARKET PRICES. ORISSA.
An investigation on factors associated with the market price of cattle and buffalo transacted in 12 markets of 6 districts of Odisha has been done during 2009. It has been found that milk yield, breed, temperament and reason of sale are the most significant contributory factors for price variation in female cattle and buffaloes. Cattle and buffaloes sold for meeting the urgent financial needs of the owner had lower market prices than the normal price. The study suggests the farmers to upgrade their indigenous cattle and buffaloes by adopting crossbreeding technology to get higher price.

012. Anjani Kumar; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Rai, D.C.; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Trends and volatility in domestic and international prices of livestock products in India ANJANI KUMAR Professor (dcrai.bhumail.com), (Animal Husbandry and Dairying), Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 221 005. 58 1 and D C RAI 2. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1248-1252 KEYWORDS: ANIMAL PRODUCTS. DOMESTIC MARKETS. WORLD MARKETS. PRICES.
The economic reform triggered during 1990s has facilitated the integration between domestic and international markets. The integration between domestic and international markets has important implications on social welfare. This paper analyse the trends and volatility in the prices of livestock products and the extent of transmission of international prices to domestic markets. The international prices of dairy products have been more volatile than domestic prices. The prices and the level instability of meat products were similar

in both the markets. The transmission of global prices would help in reducing the domestic prices of meat products except bovine meat. The prices of bovine meat would increase as a consequence of transmission of prices from international to domestic markets.

013. Senthilkumar, S.; Veterinary University Training and Research Centre, Parakkai (India). Ramprabhu, R.; Veterinary University Training and Research Centre, Parakkai (India). Pandian, A. Serma Saravana; Madras Veterinary College, Chennai (India). Department of A.H. Economics. Small ruminant marketing practices in southern Tamil Nadu. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 129-131 KEYWORDS: LIVESTOCK. MARKETING. GOATS. SHEEP. TAMIL NADU.
A study was carried out to analyze the marketing practices of small ruminants in Tirunelveli district of Tamil Nadu. It was observed that majority of farmers preferred to sell animals in their own villages itself to reap the benefits of negotiation. The modes of transportation of sheep and goats to bring them to the market were mainly jeep/truck (32.7% in livestock market-I and 35.4% at market-II), followed by through walking and by autorickshaws. The main reasons for selling the animal was urgent need of money (marked by 52.73 and 58.46%), fodder scarcity (21.82%) and fear about sickness. The most common criterion used by respondents for selling of animals was based on muscle thickness at loin and thigh region (70.91 and 81.54% in livestock market-I and market-II, respectively). In most of the cases trading was based on muscle thickness of animals at loin and thigh region. It was observed that 50 to 60% of respondents sold male kids below 6 months of age.

014. Kurup, Suresh A.; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Baliyan, Kavita; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Production and export of meat of small ruminants in India. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 163-172 KEYWORDS: MEAT. GOATS. SHEEP. MEAT YIELD. EXPORTS. INDIA.
The domestic and external demand for Indian small ruminant meat is high and is posed to register further growth. It is highly preferred in export markets due to lean meat and organic nature of production. India has achieved impressive strides in export front over the period. In this backdrop, the present study analyses the trend in production and export of small ruminant meat and the prospects of boosting it. Small ruminant population has increased considerably between

2003 and 2007 censuses - with mixed results across the states and marked increase in southern parts of the country. However, the export of the small ruminant meat has grown faster than the population growth to the extent that the incremental export was over and above the incremental production. Indian meat export has undergone structural changes- from products with bone to boneless. It was associated with geographical diversification also- away from Saudi Arabia and UAE to a large number of other major countries. It was also observed that meat production is competitive at breeder level compared to other major producers. The study calls for further deepening of the competitive edge by organized institutional efforts so as to meet the increased demand.

F04 Fertilizing

015. Gupta, Anjali; Central Institute for Research on Goats, Makhdoom (India). Tripathi, Prabhat; Central Institute for Research on Goats, Makhdoom (India). Tripathi, M.K.; Central Institute for Research on Goats, Makhdoom (India). Dutta, T.K.; Central Institute for Research on Goats, Makhdoom (India). Kumar, Ravindra,; Central Institute for Research on Goats, Makhdoom (India). Chaudhary, U.B.. Microbial and chemical changes in goat manure during composting and vermicomposting. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 207-211 KEYWORDS: COMPOSTING. OLIGOCHAETA. COMPOSTS. GOATS. FAECES.
Chemical and microbial activity changes during compost and vermicompost preparation from goat droppings were studied. Treatments were comprised of goat droppings alone or in combination of arial parts of five vegetative materials i.e Ailanthus excelsa, Prosopis juliflora, Azadirachta indica, Desmostachya bipinnata, Saccharum munja, in the ratio of 1:1 on dry matter basis. Earthworm species isenia foetida was used for vermicomposting treatments. All the treatments under composting and vermicomposting were recorded for loss in dry matter at the final stage. Extent of dry matter loss varied with plant materials and it ranged from 37 to 69% among treatments. During composting and vermicomposting carbon content reduced in all the treatments from its initial values. The maximum reduction of 77.24% in carbon was associated with Desmostachya bipinnata + goat dropping composting. The minimum total nitrogen losses were observed with Prosopis juliflora + goat faeces treatments i.e. 10.63 and 14.35% in vermicomposting and composting treatments, respectively. Mineralised nitrogen increased by

1.81 to 4.26 times from initial to final stage in all the treatments. Treatments containing earthworms had 367 to 980 times higher available phosphorus content from their initial values; however, they ranged from 349 to 485 times in composting treatments. Maximum microbial activity was associated with Saccharum munja + goat dropping under both the conditions i.e. composting and vermicomposting over other treatments. Therefore, it may be concluded that compost and vermicompost preparation from goat dropping enhance microbial activity, mineralisable nitrogen and phosphorus content in raw material and convert it into value added manure.

L01 Animal husbandry

016. Mehta, S.C.; National Research Centre on Camel, Bikaner (India). Bissa, U.K.; National Research Centre on Camel, Bikaner (India). Patil, N.V.; National Research Centre on Camel, Bikaner (India). Pathak, K.M.L.; Indian Council of Agricultural Research, New Delhi (India). Animal Sciences Division. Importance of Camel Milk And Production Potential Of Dromedary Breeds. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1173-1177 KEYWORDS: CAMEL MILK. PRODUCTION POSSIBILITIES.

The population of the dromedary in the country has gone down from 1.1 m to 0.5 m in last 3 decades. In recent past camel milk has been recognized as a possible tool to sustain the dromedary in situ. In this context this study was carried out in 6 Bikaneri and 4 Kachchhi camels. Two teat milking was followed. The average production from front and rear teats in the morning was 903.81±15.82 and 1113.31±18.40 ml and in the evening was 615.56±14.36 and 776.11±16.76 ml respectively. The average daily milk production pooled over breeds for the initial 16 months was 3606.31±64.59 ml and for rest of the months till 24 month was 2108.64±93.49 ml. The effect of breed was nonsignificant but that of individuals was significant. Out of 10 camels 9 continued till 16 months and the 1 camel, which discontinued giving milk in 14th month, got conceived in the 12^{th} month of lactation. Therefore the lactation in the camels was considered to be of 16 months duration. Accordingly the average lactation yield was 3462 litres. In second phase of lactation about 58% reduction in average daily milk yield was noticed. The average daily milk production was highest in third parity (4847.09±40.24 ml). The peak yield was observed in the third month of lactation. The promotion of camel milk will not only conserve this threatened species of desert ecosystem but

also support the life to weaker section of the society.

017. Das, D.N.; National Dairy Research Institute, Karnal (India). Kataktalware, M.A.; National Dairy Research Institute, Karnal (India). Ramesha, K.P.; National Dairy Research Institute, Karnal (India). Reddy, A. Obi; National Dairy Research Institute, Karnal (India). Productive and reproductive performances of Deoni cattle under intensive management system. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1186-1188 KEYWORDS: CATTLE. LAND RACES. INTENSIVE HUSBANDRY. ANIMAL PERFORMANCE.

Data analyzed on productive and reproductive performances under present investigation in Deoni cattle depicted that the mean birth weight and weight at AFC were 20.81±0.21 (n, 140) and 223.64±3.59 (n, 101) kg, respectively. The AFC calculated in this study was 38.73±0.73 months. The overall mean lactation milk yield based on first 5 lactations was 779.27±18.31 kg with an average lactation length of 186.31±3.02 days. The present study also revealed that there was a significant increase in milk yield in second lactation than first lactation. The overall dry period and calving interval were 256.87±7.34 and 447.22±6.64 days, respectively. The overall mortality rate in Deoni cattle recorded was 2.17%. In view of reasonably better productive and reproductive performances in the present investigation than earlier studies there is a scope for further genetic improvement of the present Deoni herd.

018. Singh, T.P.; Central Institute for Research on Buffaloes, Nabha (India). Regional Station. Singh, R.; Central Institute for Research on Buffaloes, Nabha (India). Regional Station. Singh, G.; Central Institute for Research on Buffaloes, Nabha (India). Regional Station. Das, K.S.; Central Institute for Research on Buffaloes, Nabha (India). Regional Station. Deb, S.M.; Central Institute for Research on Buffaloes, Nabha (India). Regional Station. Performance of production traits in Nili-Ravi buffaloes. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1231-1238 KEYWORDS: WATER BUFFALOES. LAND RACES. HERITABILITY. MILK YIELD. ANIMAL PERFORMANCE.

The data on production performance of 1479 Nili Ravi buffaloes, born out of 86 sires, spread over from 1990 to 2006, were analyzed to estimate the effects of sire, parity, season, period and sex of calf using mixed model. Effects of sire, parity, season and period were significantly contributing to the variation in most of the production traits. The estimates of heritability and repeatability of production traits

were low. The phenotypic and genetic trends ranged from -4.92 days (LL) to 17.19 kg (305 MY) and -46.39 kg (TLMY) to 4.24 days (LL), respectively. The phenotypic and genetic correlations ranged from –0.152 to 1.0 and –0.061 to 0.909, respectively. The endeavour to conserve this breed and to produce Nili Ravi bulls to inseminate female Nili Ravi population in their home tract is in right direction. These findings will help to plan better breeding programme for Nili Ravi buffaloes in India.

019. Singh, L.V.; National Bureau of Animal Genetic Resources, Karnal (India). Sharma, R.; National Bureau of Animal Genetic Resources, Karnal (India). Pandey, A.K.; National Bureau of Animal Genetic Resources, Karnal (India). Maitra, A.; National Bureau of Animal Genetic Resources, Karnal (India). Dixit, S.P.; National Bureau of Animal Genetic Resources, Karnal (India). Tripathi, V.; National Bureau of Animal Genetic Resources, Karnal (India). Mishra, B.P.; National Bureau of Animal Genetic Resources, Karnal (India). Identification of four novel single nucleotide polymorphisms of CAPN1 gene in Indian goat. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1239-1243 KEYWORDS: GOATS. GENETIC POLYMORPHISM. ENZYME ACTIVITY. NUCLEOTIDE SEQUENCE. CARCASS COMPOSITION.

The CAPN1 (calcium-activated neutral proteases), is thought to be the main candidate marker gene in the quality of beef meat. Corresponding protein product is nonlysosomal, intracellular cysteine protease which act as primary enzyme in the postmortem tenderization process of meat. SNPs (single nucleotide polymorphisms) in exon9 and 14 of CAPN1 in cattle have been associated with meat tenderness. Data on SNPs in the caprine CAPN1 do not exist. In this study, variations and new polymorphisms are detected in exon9 and exon14 along with their boundary regions in caprine CAPN1 by sequencing of amplified gene fragments in a panel of 7 Indian goat breeds, reared in different regions of country for various production traits. Sequenced caprine genomic segments share 90% similarity with corresponding bovine and pig sequences. Thirty four nucleotide differences were recorded in studied region of caprine CAPN1 gene as compared with that of Bos taurus (AF 252504S1 and AF 252504S2). Four novel SNPs were identified, 1 in exonic region (5707, C/T) and 3 in intronic region (intron 8; 5543 T/C and intron14; 4638 T/C, 4689 C/T). The SNP 5707 in exon 9 corresponds to nonconservative substitution (CGG to TGG) that changes an amino acid (Arg to Trp) in the protein sequence. Genotype and allelic frequency of polymorphic

sites were determined. These polymorphisms can be used in further search for associations between gene polymorphisms and enzyme activity as well as caprine meat quality traits.

020. Jai Sunder; Central Agricultural Research Institute, Port Blair (India). Kundu, A.; Central Agricultural Research Institute, Port Blair (India). Singh, D.R.; Central Agricultural Research Institute, Port Blair (India). Jeyakumar, S.; Central Agricultural Research Institute, Port Blair (India). Srivastava, R.C.; Central Agricultural Research Institute, Port Blair (India). Effect of feeding of Morinda citrifolia fruit juice on growth, production and immunity of Nicobari fowl. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1255-1258 KEYWORDS: GUINEA FOWL. LAND RACES. ANDAMAN AND NICOBAR ISLANDS. ANIMAL PERFORMANCE.
Effect of feeding of Morinda citrifolia fruit juice on the growth, production and immune response of Nicobari fowl was conducted. Fresh Morinda citrifolia fruit juice was given 1.5 ml/bird/day to group 1 (morinda fed group) and group 2 was kept as control. The average adult body weight of male bird was highest in group 1 (1864±89.22 g) than in control (1748.5±83.22 g). The average FCR value was observed best in group 1 than in control group. The peak hen day egg production of 95.24% was achieved in group 1 while in the control group the peak production was observed in the 11 week with a value of 83.11%. Highest dressing % was obtained in the group 1 (69.05%) than in control (68.38%). The humoral immune response revealed the appearance of antibody in all the groups at first week of post immunizationof goat RBC. The in-vivo cell mediated immune response to PHA-P (phytohaemagglutinin) was observed more in the group 1 (2.8±0.02) than in control (1.37±0.18). Based on the finding of the present study it is concluded that feeding of Morinda citrifolia 1.5 ml/bird /day enhanced growth, production and immune response in Nicobari fowl.

021. Wadhwa, M.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Bakshi, M.P.S; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Comparative Nutritional Status of Lactating Dairy Animals in Rural Dairy Farm Houses and Peri-urban Dairy Complexes in Punjab State of India. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 89-98 KEYWORDS: DAIRY CATTLE. DAIRY FARMS. NUTRITIONAL STATUS. LACTATION. PUNJAB.
The objective of this study was to compare the nutritional

status of animals in rural dairy farm houses (RDFHs) and peri-urban dairy complexes (PUDCs) in Punjab State of India. The PUDCs had higher (P0.01) number of adult cattle units (ACUs) as compared to RDFHs. Buffaloes predominated in both types of dairies (78.95%). But the relative proportion of buffaloes was higher (P0.05) in PUDCs as compared to RDFHs. The healthier animals (P0.01) in PUDCs as compared to RDFHs (537.4 vs. 487.7 kg BW) had higher (P0.01) milk yield (7.34 vs. 5.84 kg/animal/day) and milk urea nitrogen (MUN). However reverse trend was observed in the urinary excretion ofpurine derivatives (PDs). The animals in PUDCs were offered higher (P0.01) proportion of concentrate in the diet as compared to those of RDFHs (29.34 vs. 19.61%), reverse but significant (P0.01) trend was observed in roughage proportion. Within the roughage, green fodder constituted the bulk of DM and the relative proportion of green fodder and straw was 67.78 and 32.28%, respectively, but were statistically comparable in both the systems. The CP content in the complete feed was comparable, but the NDF and EE contents in the diet were higher (P0.01) in RDFHs as compared to those of PUDCs. On an average the complete feed contained 10.51% CP, 65.98% NDF and 2.32% EE. The daily consumption of DM and CP was comparable, while that of EE was higher (P0.05) in animal of RDFHs as compared to those of PUDCs. It was concluded that the animals in the PUDCs of Punjab state were fed higher proportion of concentrate mixture and were better off than the RDFHs but there is need to motivate the farmers to supplement the diet with mineral mixture and common salt in order to improve the productive and reproductive efficiency of the animals.

022. Gowda, N.K.S.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Manegar, A.; University of Agricultural Sciences, Bangalore (India). Krishi Vigyana Kendra. Raghavendra, A.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Verma, S.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Maya, G.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Pal, D.T.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Suresh, K.P.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Sampath, K.T.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Effect of Protected Fat Supplementation to High Yielding Dairy Cows in Field Condition. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 125-130 KEYWORDS: DAIRY COWS. FATS. MILK YIELD.

REPRODUCTIVE PERFORMANCE.
Twelve numbers of high yielding crossbred (Holstein Frisian) dairy cows in their 2–5th lactation maintained by farmers were selected based on their previous lactation yield to study the effect of protected fat supplementation on milk yield, milk composition and reproductive efficiency. Soon after calving, the first group of cows were maintained on the existing feeding schedule practiced by the farmers (G I) and second group of cows were supplemented with protected fat (10g/lit milk) in addition to the existing feeding schedule for 195 days duration (G II). The protected fat contained 9–12% ether extract and 1012% calcium. The average milk yield was significantly (P0.01) higher with large effect size (Av. 19.1 vs 17.8 lit/cow/day) in cows supplemented with protected fat. The body weight loss was less in cows fed protected fat with a moderate effect size and the regain of body weight was much quicker as compared to cows maintained on existing farmer's feeding schedule. The reproductive performance was also significantly (P0.05) better with large effect size in cows fed protected fat. Feeding of protected fat resulted in a net profit of Rs. 11.6 per cow per day due to higher milk production. It is concluded that protected fat supplementation to cows maintained on exiting feeding practices at field condition improved the milk production and reproductive efficiency in dairy cattle.

023. Ghoke, S.S.; College of Veterinary & Animal Sciences, Udgir (India). Department of Veterinary Epidemiology and Preventive Medicine. Jadhav, K.M.; Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar (India). College Veterinary Science and Animal Husbandry, Department of Veterinary Medicine. Thorat, K.S.; College of Veterinary & Animal Sciences, Udgir (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Assessing the Osmotic fragility of Erythrocytes of rural and semiurban Camels (Camelus dromedarius). Camel: An International Journal of Veterinary Sciences (India). (Jan 2013) v. 1(1) p. 75-78 KEYWORDS: CAMELS. DROMEDARIES. OSMOTIC DRYING. Dromedary camel, despite subjected to harsh environmental condition, has been adapted to arid and dry climate. Camel has shown exceptional ability to withstand considerable period of dehydration and camel erythrocytes have the ability to expand twice their volume without rupturing in hypotonic solution. Osmotic fragility of camel erythrocyte of rural and semi urban area was compared especially in relation to exposure to pollutants. Camel erythrocyte did not show any hemolysis when suspended to descending concentration of

NaCl solution. The greater resistance of camel erythrocyte to osmotic fragility was attributed to their morphological characteristics and its membrane protein.

024. Dass, Gopal; Central Institute for Research on Goats, Makhdoom (India). Genetics and Breeding Division. Mandal, Ajoy; Central Institute for Research on Goats, Makhdoom (India). Genetics and Breeding Division. Rout, P.K.; Central Institute for Research on Goats, Makhdoom (India). Genetics and Breeding Division.Roy, R.; Central Institute for Research on Goats, Makhdoom (India). Genetics and Breeding Division. Rearing practices, morphological characteristics and growth performance of Muzaffarnagari sheep in its home tract. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 37-40 KEYWORDS: SHEEP. ANIMAL HUSBANDRY METHODS. GROWTH RATE. UTTAR PRADESH.

A survey was conducted to study the rearing practices, morphological characteristics and growth performance of Muzaffarnagari sheep in the breeding tract. Data on 512 sheep of either sex pertaining to different age groups were recorded. The results revealed that flocks were mainly maintained by Pal/Gadaria and Khatik communities on extensive system. Lambing and breeding were recorded round the year in the flocks. Animals were shorn twice a year using hand scissors. Overall means for body length, height at withers, chest girth and tail length of lambs (0–1 month old) ranged from 25–28, 32–35, 35–57 and 21–37 cm, respectively. The corresponding figures ranged from 49–55, 55–61, 53–63, 36–44 cm in 1–3 month, 53–60, 59–63, 61–70 and 42–43 cm in 3–6 month, 63–71, 68–76, 65–75 and 42–45 cm in 6–9 month, 80–83, 73–79, 79–81 and 50–54 cm in 9–12 month age groups and 79–86, 80–87, 82–89 and 54–52 cm in adult sheep. The least squares means of body weight were recorded as 6.32, 14.80, 19.82, 22.75, 25.57 and 42.33 kg, respectively in the corresponding age groups. Effect of sex was highly significant (P0.01) on body weights in all age group except 0–1 month.

025. Tailor, S.P.; Bhilwara Maharana Pratap University of Agriculture and Technology, Udaipur (India). Krishi Vigyan Kendra. Yadav, C.M.; Bhilwara Maharana Pratap University of Agriculture and Technology, Udaipur (India). Krishi Vigyan Kendra.. Studies on morphometric traits and body weight of sonadi sheep at lambing in their native tract. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 41-43 KEYWORDS: SHEEP. LAND RACES. BODY WEIGHT. RAJASTHAN. PARTURITION. REPRODUCTIVE PERFORMANCE.

Sonadi sheep is popular for triple purpose i.e. milk, meat and wool. Data with respect to measurements i.e. body length, height at withers and heart girth and body weights of 6979 Sonadi sheep maintained by 147 registered shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded. Least-squares analysis of variance was employed to study the effect of districts and parity on the body weights and measurements. The variations due to district and parity were found to be significant for all the body measurements (P0.01) and dam's weight at lambing (P0.05/0.01). The overall least-squares means for dam's weight at lambing was 27.87±0.62 kg. Ewes weight at lambing and body measurements were significantly (P0.01) heavier in Chittorgarh district (31.18 kg) compared to other districts. The effect of parity on all the body measurements and weight was significant. The weight of ewes at lambing was significantly lower during I (26.54±0.66 kg) and II (27.64±0.66 kg) lactation compared to ewes in III (28.38±0.64) and IV (28.71±0.67) lactations. It may be concluded that the district-wise variation in all the body measurements and weight of adult may be due to differences in feed resources and management practices.

026. Bumla, Nazir A.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Wani, Sarfaraz A.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Shakyawar, D.B.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Sofi, Asif H.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Yaqoob, Ishrat; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Sheikh, F.D.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (India). Faculty of Veterinary Science and Animal Husbandry, Division of Livestock Products Technology. Effect of machine dehairing on quality of Pashmina fibre. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 118-120 KEYWORDS: WOOL. SHEARING. CASHMERE.

QUALITY.
A study was conducted to compare the quality of Pashmina fibre dehaired manually and mechanically. Pashmina was procured from All Changthangi Pashmina Growers Association, Leh, Ladakh. Samples were drawn randomly from different bales. The total Pashmina sample was divided into two parts. Half of the Pashmina was dehaired manually while remaining half was dehaired on machine. Both types of pashmina fibres were evaluated for fineness, length, bundle strength, coefficient of friction and scanning electronic imaging (SEM). Fibre diameter and bundle strength showed non-significant difference whereas fibre length and co-efficient of friction showed significant difference (P0.05) between the dehairing methods. SEM images clearly showed that machine dehairing damages the surface of Pashmina fibre. From the study, it was concluded that the machine dehairing results in reduction of fibre strength by damaging the surface structure thus it may reduce the life of the final product.

027. Tanwar, P.S.; Krishi Vigyan Kendra, Sardarshahar (India). Rohilla, P.P.; Krishi Vigyan Kendra, Sardarshahar (India). Goat management practices adopted by farmers in Jaipur district of Rajasthan. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 121-124 KEYWORDS: GOATS. ANIMAL HUSBANDRY. LIVESTOCK MANAGEMENT. RAJASTHAN.
A survey of goat farmers in Jaipur district of Rajasthan indicated that majority of them (94.58%) provided katcha floor for the goat houses. Nearly 50% of farmers constructed goat houses near human dwelling. Small farmers with limited number of goats housed them in human dwelling. Majority (92.08%) of goat farmers used locally available thatch material for construction of roof. Boundary walls of goat houses were made with dry twigs of Khejri (Prosopis cineraria), Keekar (Acacia nilotica) and Pala (Zizyphus nummularia) bushes. Majority of the farmers (87.92%) housed males and females together but kids separately. Daily cleaning of goat house was practiced by 66.25% farmers. Deworming of goats was practiced regularly by 44.58% farmers. Only 23% of the farmers adopted vaccination against common infectious diseases. Majority of the farmers (68.33%) preferred village Gunni for treatment of sick goats, however 57.63% of large farmers approached veterinarian for treatment. Most (92.08%) of farmers sold goats to the local traders in their own villages. Physical appearance of the animals was considered as the main criteria for selling (48.33%) of animals. Majority of male kids were sold within

7–12 months of age.

028. Sakthivel, K.M.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry Extension. Narmatha, N.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry Extension. Akila, N.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry Extension. Uma, V.; Veterinary College and Research Institute, Namakkal (India). Department of Veterinary and Animal Husbandry Extension. Management practices followed by goat farmers in Namakkal district of Tamil Nadu. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 125-128 KEYWORDS: GOATS. ANIMAL HUSBANDRY. ANIMAL HUSBANDRY METHODS. TAMIL NADU.

A study was conducted among 140 goat farmers in Namakkal district of Tamil Nadu to ascertain the management practices followed by them. The study revealed that goats were mostly housed in thatched shed with mud flooring. They were fed tree leaves, crop residues and the fodder. Bleating, mounting and wagging were the signs used for heat detection and natural service followed for breeding of goats. Pregnancy diagnosis was mainly done based on abdominal appearance. Majority of the farmers reported that they have not faced any major disease problems. Foot and mouth disease was the only disease for which animals were vaccinated. Generally deworming was done in kids below the age of 3months. Most of the farmers sold their goats at the age of 4–6 months in village weekly markets to meet the family needs. The study revealed there is a need to create awareness on scientificpractices of goat rearing.

029. Kumar, Amit; Birsa Agricultural University, Ranchi (India). College of Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Ahmad, Maroof; Birsa Agricultural University, Ranchi (India). College of Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Singh, L.B.; Birsa Agricultural University, Ranchi (India). College of Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Factors influencing birth weight of black bengal and crossbred kids. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 132-134 KEYWORDS: KIDS. LAND RACES. BIRTH WEIGHT.

Data on 54 Black Bengal, 272 (50% Beetal x 50% Black Bengal) and 145 (50% Sirohi x 50% Black Bengal) kids were used to

assess the variation in birth weight due to season of birth, sex of kid, type of birth, parity of dam and weight at kidding. Season of birth of kids had significant (P0.01) influence on birth weight in all three genetic groups. There was no significant effect of sex on birth weight in Black Bengal kids, however, significant effect of sex was observed in Beetal and Sirohi half-breds. Type of birth, parity of dam and weight of dam at kidding had significant (P0.05) effect on birth weight of kids in all three genetic groups.

030. Birari, D.R.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Desale, R.J.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Deokar, D.K.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Deshmukh, A.R.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Mandakmale, S.D.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Growth performance of osmanabadi goats under field conditions. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 135-137 KEYWORDS: GOATS. LAND RACES. ANIMAL PERFORMANCE. GROWTH RATE.
Body weights on 4869 Osmanabadi goats of both the sexes were recorded at birth, 3, 6 and 12 months of age under farmers’ management in Ahemadnagar, Solapur and Osmanabad districts of Maharashtra. The body weights in males were higher at all the ages except 12 months compared to females. The effect of sex of kid and district was significant (P0.01) on the body weights of goats indicating greater scope for improvement in the body weights of Osmanabadi goats through selection.

031. **031.** Borah, B.K.D.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Deka, B.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Nath, K.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Biswas, R.K.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Sarmah, B.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal

Reproduction, Gynaecology and Obstetrics. Effect of extenders on preservability of chilled beetal buck semen. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 138-140 KEYWORDS: GOATS. SEMEN. SEMEN PRESERVATION. Twenty-five ejaculates (five from each of five Beetal bucks) were used to study the preservability of Beetal buck semen in three extenders viz., Tris, Tes-Tris and Egg yolk phosphate. The mean sperm motility and live sperm at 72 h of preservation at 5°C in Tris, Tes-Tris and Egg yolk phosphate extenders were 59.60±1.44 and 67.64±1.62, 57.40±1.39 and 64.46±1.50, 53.00±1.19 and 61.88±1.58%, respectively. The interaction between extender and hour of preservation was not significant. The mean per cent sperm motility was significantly (P0.01) higher in Tris and Tes-Tris than in Egg yolk phosphate extender and the mean per cent live sperm was significantly (P0.01) higher in Tris than Tes-Tris and Egg yolk phosphate extender. It is concluded that Tris extender is superior to Tes-Tris and Egg Yolk phosphate extender for preservation of Beetal buck semen at 5°C under the agro-climatic conditions of Assam.

032. Poonia, J.S.; LLR University of Veterinary and Animal Science, Hisar (India). Department of Animal Genetics and Breeding. Malik, B.S.; LLR University of Veterinary and Animal Science, Hisar (India). Department of Animal Genetics and Breeding. Disease pattern in mortality of beetal goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 152-153 KEYWORDS: GOATS. MORBIDITY. MORTALITY.
Data on 553 cases of post-mortem reports spread over 22 years were utilized to study the effect of age and season on disease pattern in Beetal goats under semi-intensive management system. The overall incidence of pneumonia was (56.06%) followed by enteritis (18.63%), pneumoenteritis (11.75%), helminthosis (4.34%), hepatitis (1.08%), toxaemia (1.45%), coccidiosis (1.81%) and colibacillosis (0.72%). Proper identification of cause and sensitivity of drugs will reduce the mortality rate considerably.

033. Mahale, Geeta; University of Agricultural Science, Dharwad (India). College of Rural Home Science. Kotur, Rajashri; University of Agricultural Science, Dharwad (India). College of Rural Home Science. Byadgi, Shameembanu; University of Agricultural Science, Dharwad (India). College of Rural Home Science. Utilization of Deccani wool in Karnataka. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 154-156 KEYWORDS: SHEEP. ANIMAL HUSBANDRY METHODS. WOOL.

Sheep rearing practice is more common in Lakkundi, Hirenarthi, Neglur, Havnoor, Medleri, Kadoli, Hunnur and Narsapur villages of Karnataka state. Mainly Deccani sheep were reared by the respondents, shearing of wool was practiced in the month of June and December. Asanas/mats, wool kambal/blankets, musical drum, wool bags, mobile purse, slinging purse, felt cap, hand bags were the products prepared by the respondents. The major problems felt by them were lack of financial assistance in making products, lack of demand, transportation, marketing and high commission of middle men while selling their products.

034. Jagdale, V.V.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Deokar, D.K.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Department of Animal Science and Dairy Science. Birari, D.R.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Mandakmale, S.D.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India) .Kaledhonkar, D.P.; Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Body weights and measurements of sangamneri goats during post- Weaning stage under field conditions. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 184-187 KEYWORDS: GOATS. POSTWEANING PERIOD. BODY WEIGHT.

Analysis of growth data of Sangamneri goats reared under field conditions for a period of 5 years revealed that the least squares means of body weights at 3, 6 and 9 months of age were 9.02±0.08, 14.09±0.10 and 17.77±0.13 kg respectively. The least squares means for heart girth, body length and height at withers at 3, 6 and 9 months of age were 47.69±0.18, 55.35±1.18, 59.06±0.21cm; 42.63±0.17, 49.30±0.17, 53.40±0.23 cm and 48.13±0.20, 56.01±0.21, 60.34±0.21 cm, respectively. Cluster of villages and sex had significant (P0.01) effect on body weights and height at withers at 3, 6 and 9 months, on body length at 3 and 9 months and on heart girth at 3 and 6 month of age. Year and season of birth showed significant (P0.05) effect on body weights at 9 and 6 months of age. Year of birth had significant (P0.05) effect on body length at 6 months and on height at withers at 6 and 9 months of age. Sex had significant (P0.01) effect on height at withers at 3 and 6 months of age.

035. Panda, Pragati; Orissa University of Agriculture and Technology, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Rao, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). College of

Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Kumar, P.; Orissa University of Agriculture and Technology, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry, Department of Animal Breeding and Genetics. Performance of edka sheep of puri district of Odisha. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 188-190 KEYWORDS: SHEEP. ANIMAL PERFORMANCE. ADAPTATION. BIODIVERSITY. ORISSA.

A study on the performance of Edka sheep of coastal areas of Puri district of Odisha showed that these sheep are medium in size with an average adult body weight of 24.67±0.07 kg. The overall least squares means of body weights at birth, 3, 6, 9 and 12 months of age were 1.93±0.03, 6.14±0.05, 10.28±0.07, 14.66±0.08 and 18.57±0.06 kg, respectively. The least squares means of age at sexual maturity, gestation period, age at first lambing, lambing interval and age at second lambing were 208.64±2.29, 149.54±0.06, 379.33±1.28, 210.66±0.06 and 589.52±2.37 days, respectively. The twinning rate was more than 70% from second lambing onwards. Sheep rearing is dependable source of subsidiary income under low input system for the farmers of coastal region of Odisha.

036. Gadekar, Y.P.; Central Sheep and Wool Research Institute, Avikanagar (India). Shinde, A.K.; Central Sheep and Wool Research Institute, Avikanagar (India). Arora, A.L.; Central Sheep and Wool Research Institute, Avikanagar (India). Prakash, Ved; Central Sheep and Wool Research Institute, Avikanagar (India). Karim, S.A.; Central Sheep and Wool Research Institute, Avikanagar (India). Meat yield and quality traits of newly developed prolific sheep. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 229-234 KEYWORDS: SHEEP. MEAT PERFORMANCE. MEAT YIELD. CARCASS COMPOSITION. LAND RACES. RAJASTHAN.

Mutton production potential and meat quality traits of prolific crossbred sheep developed at Central Sheep and Wool Research Institute, Avikanagar, Rajasthan were studied. Nine yearling males of GMM (Garole-Malpura x Malpura) x Patanwadi (A genotype) and five yearlings of Patanwadi x GMM (Garole-Malpura x Malpura) (B genotype) were slaughtered at the age of 15–16 months. The pre-slaughter weights were significantly (P0.05) higher (41.13 vs. 33.56 kg) in A genotype than that of B. Similarly, higher hot carcass weights were significantly (P0.01) higher in A genotype (19.23 kg) compared to B (14.52 kg). However, dressing yield on empty live weight basis did not differ significantly between

the genotypes. Loin eye area and total inedible offal weights were significantly (P0.01) higher in A genotype. No significant difference was observed in commercial carcass cuts except neck and shoulder. Chilling losses, lean yield, subcutaneous fat, intramuscular fat and meat quality attributes viz., water holding capacity, shear force value and cooking losses were similar between the genotypes. The study indicated that A genotype owing to heavy weights produced more mutton; however meat quality traits were almost similar in both the genotype.

037. Ekambaram, B.; Sri Venkateshwara University, Hyderabad (India). College of Veterinary Science. Gupta, B.R.; Sri Venkateshwara University, Hyderabad (India). College of Veterinary Science. Prakash, M.G.; Sri Venkateshwara University, Hyderabad (India). College of Veterinary Science. Sudhakar, K.; Sri Venkateshwara University, Hyderabad (India). College of Veterinary Science. Reddy, V.R.; Sri Venkateshwara University, Hyderabad (India). College of Veterinary Science. A Study on Carcass Characteristics of Mahabubnagar Goats. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 121-126 KEYWORDS: GOATS. LAND RACES. CARCASS COMPOSITION. INDIA.
Eight male Mahabubnagar goats were slaughtered to study the meat production potential and carcass traits. The dressing percentages based on pre-slaughter weight and empty body weight were 44.60 ± 0.95 and 59.74 ± 1.07, while the average pre-slaughter weight, empty body weight and hot carcass weights were 24.36 ± 1.00, 18.29 ± 1.09 and 10.90 ± 0.60 kg respectively. The mean edible and inedible organs weight were 0.81 ± 0.02 and 6.97±0.25 kg respectively. The mean weight of primal cuts of carcass i.e., leg, loin, rack, neck and shoulder, breast and fore shank were 3.75 ± 0.28, 1.10 ± 0.04, 0.97 ± 0.05, and 2.91 ± 0.17 and 2.21 ± 0.12 kg respectively. High proportion of meat in neck and shoulder (70.97%), bone in rack (37.33%) and fat in loin (5.71%) regions of primal cuts were noticed. The pre-slaughter weight and dressing percentages were correlated positively and significantly with all the primal cuts except loin. The pre-slaughter weight significantly contributed to the prediction of total edible organs, total inedible organs and different primal cuts.

038. Selvan, S.T.; Tamil Nadu Veterinary and Animal Sci. Univ., Kattupakkam (India). Livestock Research Station, Ostrich Breeding Unit. Kumarasamy, P.; Tamil Nadu Veterinary and Animal Sci. Univ., Kattupakkam (India). Livestock Research Station, Ostrich Breeding Unit. Thyagarajan, D.; Tamil Nadu

Veterinary and Animal Sci. Univ., Kattupakkam (India). Livestock Research Station, Ostrich Breeding Unit. Growth performance of ostriches (Struthio camelus) in India. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 176-179 KEYWORDS: OSTRICHES. GROWTH RATE. GROWTH. INDIA.

Ostrich (Struthio camelus) farming is a new upcoming venture in India. Ostrich farming was started in India during 2000 with the sole objective of studying its adaptability and commercial viability. Experience revealed that rearing, feeding and nutrition of ostriches were quite different from other poultry species. Out of 68 chicks hatched, the survival percentage was 58.8% up to the age of 18 months. Chick mortality below 3 months of age was one of the most critical phase of rearing. The live body weight was 3.78 ± 0.17 kg at 1 month of age with a feed conversion of 1.67 and 118.21 ± 2.81 kg at 18 months with a feed conversion ratio of 7.50. The average daily body weight (ADG) gain during the period was 220g.

039. Patil, Chandrashekhar S.; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Chakravarty, A.K.; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Kumar, Vijay; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Sharma, Raghvendra Kumar; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Kumar, Pankaj; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division.. Average performace of various first lactation 305 day and test day milk yield in Murrah buffaloes. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 310-312 KEYWORDS: WATER BUFFALOES. LACTATION DURATION. MILK YIELD. MILK PERFORMANCE.

In the present investigation the average performance of various first lactation production traits in murrah buffaloes has been studied. In this study 707 first lactation production records of murrah buffaloes maintained at National Dairy Research Institute (NDRI), Karnal were collected and analysed. The present study revealed that the average first lactation (305-days or less) milk yield in Murrah buffaloes was 1750.91 ±28.62 kg. The coefficient of variation of first lactation (305 day) milk yield was observed as 43.31%. The minimum first lactation monthly test day milk yield (FLMTDMY) was found to be 4.36±0.09 kg on TD 1 while maximum FLTDMY was found to be 8.06±0.09 kg on TD 3. The coefficients of variation of first lactation monthly Test day milk yield varied from 29.67% to 43.31%.

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040. Pattanaik, J.R.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Das, S.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Mishra, S.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Panda, N; Orissa University of Agriculture and Technology, Bhubaneswar (India). Pati, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Dehuri, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Effect of fibre degrading multi-enzyme on the performance of commercial broiler. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1052-1059 KEYWORDS: BROILER CHICKENS. FEEDING. CEREAL BYPRODUCTS. ENZYMES. ENZYME ACTIVITY. NUTRITION PHYSIOLOGY. DIGESTIBILITY. DRESSING PERCENTAGE.

The objective of the present experiment is to study the effect of multi-enzyme on maize-soyabean-deoiled rice bran (DORB) diets on broiler. Day-old broiler chicks (192) were randomly distributed into 8 groups. In 4 control groups i.e. C 1 , C 2 , C 3 , C 4 the ME content of starter feed was decreased 0, 5, 7.5, 10%, respectively, from C (2800 Kcal/kg and CP 23%). In the treatment groups i.e. T 1 , T 2 , T 3 and T multi enzyme was added 500 g/ tonne of feed. At the end of the experiment, the birds of T 1 4 group recorded highest body weight of 1760 g which was not significantly different with T 2 and C 1 . During fourth, fifth and sixth week of age, chicks under the enzyme treated groups in T had higher body weights. At the end of the sixth week the FCR by the birds varied between 2.01 to 2.34. The average retention nitrogen in all the control groups varied from 36.34 to 49.24% and in treated groups from 38.36 to 50.59%. The digestibility of CF decreased and the % retention of energy in T 1 , T 2 and T groups was significantly higher than their corresponding control groups. Calcium and phosphorus retention in the birds varied from 37.58 to 41.13% and 28.98 to 32.15% in control where as it varied from 38.70 to 45.60% and 34.94 to 38.87 in treated groups, respectively. There was nonsignificant difference in dressing percentage and yield percentage in all the treated groups. By addition of enzyme to the control ration, the expenditure on feed was reduced. 4.

041. Behura, N.C.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Dehuri, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Mishra, S.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Das, S.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Feeding value of simaruba (Simarouba glauca) fat in broilers. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1060-1063 KEYWORDS: BROILER CHICKENS. SIMAROUBACEAE. FEEDING. FEED CONVERSION EFFICIENCY. FEED INTAKE.

The effects of simaruba fat (SF) use was studied on day-old broiler chicks (500). The chicks were distributed into 5 groups, each having 5 replicates. Test diets, viz. T 1 (control), T 2 (2.5% SF), T 3 (5% SF), T 4 (7.5% SF) and T (10% SF) were tried. The body weight gain and feed consumption were recorded. The serum biochemical, enzyme activity and histopathological examinations were done at the end of experiment. The sixth week average body weight in T , T 4 and T were 1854, 1845, 1836, 1829 and 1818g, respectively. The sixth week body weight of different groups did not differ significantly. The feed conversion ratio (FCR) of T 5 1 , T 2 , T 3 , T 4 and T were 1.92, 1.90, 1.90, 1.88 and 1.87, respectively. The mean serum triglycerides, cholesterol, HDL cholesterol, total protein, albumin, globulin, serum urea nitrogen, and serum uric acid values of the broilers fed different levels of SF did not differ significantly from the control. There was no significant difference in the mean serum ASAT, ALAT and ALP activities between the groups. Histopathology examination revealed that in T 5, there was moderate to marked vascular congestion of the portal veins and sinusoidal distention with increased activity of Kupffer cells. The cost of broiler production was reduced with the increase in the level of SF in the diet. The experimental results revealed that the expeller pressed SF could be incorporated in the broiler ration up to 7.5% without any deleterious effect on growth and FCR.

042. Chaudhary, J.L.; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Directorate of Planning and Monitoring. Tiwari, G.S.; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Directorate of Planning and Monitoring. Effect of Feeding Different Levels of Dietary Energy on Nutrient Utilisation, Draught Performance and Physiological Reactions of Camels. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 27-34 KEYWORDS: CAMELS. NUTRITIVE VALUE. DRAUGHT ANIMALS. NUTRITION PHYSIOLOGY.

An experiment was conducted on nine draught camels (7–10 years aged and 580.44±0.12 kg BW) kept on sole roughage diet of dry gram straw (Cicer arietinum L.) along with various levels of energy in concentrate mixtures for 60 days. The camels were randomly divided in to three equal groups and allotted three dietary treatments having 65 (T1), 70 (T2) and 75 percent (T3) TDN in concentrate mixture. The camels were subjected to payload of 2.8 kg/kg BW (18% BW) on a two wheeled camel cart. The camels covered 25.5 km distance in 2.53±0.08 to 3.07±0.17 h at an average speed of 1.72±0.01 m/sec. in continuous work during summer season (April to June). The DM, DCP and TDN intake were observed significant different among the treatments. The water intake (litres) was significantly (P0.05) higher in T3 followed by T2 and T1. The digestibility coefficient of DM, CP, CF and EE were significantly (P0.05) higher in T3 group as compared to T2 and T1 groups. The respiration rate, pulse rate and rectal temperature were significantly higher in T1 followed by T2 and T3 groups, respectively. The draught performance of T3 group was significantly (P0.05) higher as compared to T2 and T1 groups. Similarly, power generated by the camels was significantly higher in T3 (1.23 hp) followed by T2 (1.13 hp) and T1 (0.99 hp), respectively. Study suggested that by increasing the level of energy in the diet of draught camels, nutrient intake, digestibility and draught performance increases with normal physiological responses and camelscan tolerate the work stress without any ill effect on their health.

043. Elangovan A.V.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Gowda, N.K.S.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Satyanarayana, M.L.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Suganthi, R.U.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Rao, S.B.N.; National Institute of Animal Nutrition and Physiology, Bangalore (India). Sridhar, Manpal; National Institute of Animal Nutrition and Physiology, Bangalore (India). Jatropha (Jatropha curcas) Seed Cake as a Feed Ingredient in the Rations of Sheep. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 57-67 KEYWORDS: SHEEP. JATROPHA. JATROPHA CURCAS. FEEDS. INGREDIENTS.

A study was conducted to assess the detoxification of the commercially available jatropha cake and the feasibility of its use in the diet of lambs. The chemical processing of jatropha cake indicated 3% sodium hydroxide or sodium bicarbonate was effective in reducing the phorbol esters to the extent of

55% level and curcin completely. For experimental feeding, 36 Deccani lambs (BW 11.41±0.312 kg) of 46 months of age were randomly divided into six groups (six lambs in each group) and fed with three rations, viz., control (group 1, 2); raw jatropha cake (group 3, 4), and 3% sodium bicarbonate-treated jatropha cake (group 5, 6) both at 25% level in the concentrate mixture. The feeding of jatripha cake led to appearance of clinical signs, first observed on day 3 or 4, in terms of dullness, inappetence, diarrhoea, moaning and recumbency resulting in the mortality of lambs irrespective of treatment, and within 4–11 days of experimental feeding, there were eight mortalities. The blood biochemical parameters with respect to serum protein, alanine amino transferase, aspartate amino transferase and alkaline phosphatase were all significantly (P0.01) affected due to the jatropha-diets. The gross pathological changes indicated hydro-pericardium and enlargement of heart, congestion in kidney with apparently normal liver in lambs died within 6d of feeding, whereas, liver was dark, congested in lambs which died after 10d of feeding. The feeding of jatropha cake was discontinued after 11d of experimental feeding; mortality was completely checked after 13d. The lambs gradually improved from the dullness and depression to normal activity in about one month post-recovery period and no further mortality was recorded. The results indicated that the jatropha cake feeding should be carried out only after ensuring its complete detoxification.

044. Chaudhary, J.L.; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Directorate of Planning and Monitoring. Jat, H.R.; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Directorate of Planning and Monitoring. Effect of Feeding Different Levels of Whole Cottonseed (Gossypium spp.) on Performance of Lactating Buffaloes. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 99-107 KEYWORDS: WATER BUFFALOES. COTTONSEED. NUTRIENT INTAKE. FEED CONVERSION EFFICIENCY. DIGESTIBILITY. MILK YIELD.

Eighteen lactating Surti buffaloes in early stage of lacation divided into 3 groups of 6 animals each on milk yield (6.75±0.27 kg) and body weight (475.83±15.30 kg), basis were fed on 3 levels of whole cottonseed in their rations (T1; 0, T2; 30 and T3; 60%). In all the experiment, animals were also fed 15 kg green lucerne and ad libitum sorghum stover. The DMI, DCPI and TDNI were significantly (P0.05) higher in T3 than T2 and T1. The digestibility of OM, CP, CF and EE was significantly (P0.05) influenced by the levels of cottonseed in

the ration. The total water intake was 66.55, 70.03 and 71.85 in T1, T2 and T3, respectively, which was significantly higher in T3 and T2 than T1 The average 6% FCM yield (kg) was 9.21, 10.16 and 11.32 in T1, T2 and T3 groups, respectively. Significantly higher (P0.05) milk yield was recorded in T3 than T2 and T1 however, T2 and T1 groups were comparable for milk yield. The DCP and TDN consumed per kg milk produced were not significantly affected by various levels of cottonseed in the ration. The same trend was observed in the case of net protein and net energetic efficiency among the three feeding regimes. The post-partum period and oestrus period was reduced significantly (P0.05) in T3 than T2 and T1 but the difference for number of services per conception was comparable among the treatments. It can be concluded that by increasing the level of cottonseed in the diet, the performance of lactating buffaloes can be enhanced.

045. Premalatha, N.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Saravanakumar, V. Ramesh; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Sivakumar, K.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Jagatheesan, P.N. Richard; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Ramesh, V.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Growth and carcass characteristics of soviet chinchilla rabbits fed mulberry and hedge lucerne leaves. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 85-89 KEYWORDS: RABBITS. FEEDING. MORUS. LEAVES. LUCERNE. CARCASS COMPOSITION.

To study the effect of feeding mulberry and hedge lucerne leaves on growth, carcass characteristics and cost effectiveness, 48 Soviet Chinchilla weaner rabbits were divided into two equal groups. The mean weekly dry matter intake was significantly (P 0.01) higher in hedge lucerne group than mulberry group at 15th week of age. In hedge lucerne group, the female rabbits showed significantly (P 0.01) higher dry matter intake than male rabbits at 15th week of age. The overall feed efficiency was 5.17 in males and 4.42 in females of mulberry group and it was 4.49 in males and 6.14 in females of hedge lucerne group. In carcass characteristics, there was non-significant difference between green forages and sexes. The mean cost per kg weight gain in male rabbits

under mulberry group was significantly (P0.05) higher (Rs. 67.21±2.31) than the hedge lucerne group (Rs. 61.25±1.44). It can be concluded from the study that hedge Lucerne leaves are as good as mulberry leaves in feeding of rabbits.

046. Chaturvedi, O.H.; Central Sheep and Wool Research Institute, Avikanagar (India). Sahoo, A.; Central Sheep and Wool Research Institute, Avikanagar (India). Gulyani, R.; Central Sheep and Wool Research Institute, Avikanagar (India). Concentrate supplementation to ewes grazing on community rangeland during late gestation and early lactation. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 145-147 KEYWORDS: EWES. GRAZING. GRAZING LANDS. CONCENTRATES. SUPPLEMENTARY FEEDING. PREGNANCY. LACTATION.

Malpura and Kheri ewes (34), 3–4 years old, in their late gestation and weighing 36.12±2.63 kg were randomly selected and divided into two groups of 24 (G1) and 10 (G2). Ewes in both the group were grazed on rangeland from 07.00 to 18.00 h followed by night shelter in animal shed. The ewes in G1, in addition to grazing received concentrate mixture (350 g/ewe/day) during entire late gestation to early lactation. The body weight of ewes at parturition was higher in G1 than in G2. The birth weight of lambs in G1 (3.66 kg) was higher (P0.01) than that in G2 (3.07 kg). The body weights of lambs at 15, 30, 45 and 75 days of age were also higher (P0.01) in G1 than in G2. The body weight gain and average daily gain of lambs at 75 days of age was also higher (P0.01) in G1 than in G2. Milk yield of ewes increased up to 200 g per day due to concentrate supplementation in G1 in comparison to without concentrate supplementation. The lambs of supplemented ewes were sold at higher rates (Rs. 1900/lamb) than those of non supplemented ewes (Rs. 1400/lamb). Concentrate supplementation (350 g/ewe/day) during these critical stages enhanced their production performance, general condition as well as birth weight and growth rate of lambs.

047. Shinde, A.K.; Central Sheep and Wool Research Institute, Avikanagar (India). Sankhyan, S.K.; Central Sheep and Wool Research Institute, Avikanagar (India). Kumar, D.; Central Sheep and Wool Research Institute, Avikanagar (India). Regar, Rajesh Kumar; Central Sheep and Wool Research Institute, Avikanagar (India). Effects of supplementation of copper and zinc on nutrient intake, utilization, blood profile, wool yield and semen quality of malpura Rams. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 191-197 KEYWORDS:

RAMS. SUPPLEMENTS. NUTRIENT IMPROVEMENT. COPPER. ZINC. NUTRIENT INTAKE. NUTRITION PHYSIOLOGY. WOOL PRODUCTION. SEMEN.

The effect of supplementation of copper and zinc on nutrient intake, utilization, blood profile and wool yield and semen quality of Malpura rams was studied. Twenty-seven adult Malpura rams (4–5 year old) were randomly divided into 3 groups of 9 each. Concentrate feed fed to rams of Group I (G-I) did not contain supplemental Zn and Cu, inorganic Zn and Cu as sulphate (50% of basal diet) and Cu and Zn methionine (25% of basal diet) was fed to Group II (G-II) and Group III (G-III) rams. Cu and Zn contents of concentrate feed, was 16.87, 34.67 ppm in G-I; 37.15, 48.56 ppm in G-II and 26.19, 39.58 ppm in G-III, respectively. Daily dry matter intake, digestible crude protein and metabolizable energy remained similar among groups. Similarly, dry matter, crude protein, neutral detergent fibre and acid detergent fibre digestibility of feed did not affected by mineral supplementation. Mean serum glucose, total protein, albumin, globulin, urea and cholesterol concentration were not influenced by mineral supplementation. Cu and Zn supplementation significantly (P0.01) increased the Cu and Zn concentration of serum in G-II and G-III. Semen volume increased from 0.75 in G-I to 0.89 in G-II and 0.78 ml in G-III. Similarly, mass motility on 0–5 scale also increased from 4.03 in G-I to 4.35 in G-II. However, sperm motility decreased from 82.3 in G-I to 76.7 in G-II and 67.6% in G-III. Rapid motile sperm also decreased from 73.7 in G-I to 68.5 in G-II and 56.0% in G-III. Wool yield of rams was increased by 16.89% in G-III over G-II. Cu and Zn concentration of wool samples was significantly (P0.01) increased in G-II and G-III. The body weight gain of rams did not differ significantly between the groups. The study suggested that there was no effect of Cu and Zn supplementation on nutrient intakes, digestibility, semen volume and quality except wool yield.

048. Nagalakshmi, D.; College of Veterinary Science, Hyderabad (India). Reddy, D. Narasimha; College of Veterinary Science, Hyderabad (India). Comparative evaluation of diets containing red gram (Cajanus cajan) stalks and sorghum stover as roughage for sheep. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 198-201 KEYWORDS: SHEEP. CAJANUS CAJAN. SORGHUM. FEED GRASSES. NUTRITIVE VALUE.

Feeding value of red gram (Cajanus cajan) stalks (RGS) as roughage source was compared with sorghum stover in 18 adult Deccani rams. The rams were randomly allotted to 3

dietary treatments viz., ad libitum chopped sorghum stover, ad libitum chopped sorghum stover with 250g concentrate and ad libitum ground RGS with 250g concentrate. The RGS contained 4.11% crude protein (CP), 0.64% ether extract (EE), 60.4% crude fibre (CF) and 2.24Mcal/kg of gross energy. Digestibility of dry matter (DM), organic matter (OM), ether extract (EE), nitrogen free extract (NFE) and energy with RGS was lower (P0.01) than with sorghum stover. Nitrogen (N) balance was not affected, but Ca and P balances were lower (P0.01) on RGS diet compared to those fed sorghum stover diet. Daily DM intake (2.42% and 3.20%) was lower with RGS than with sorghum stover, respectively, reflecting lower palatability of RGS. The nutritive value of red gram stalks obtained by difference method indicated that it contained 1.57% DCP and 47.62% TDN and could be used as roughage in the diet of sheep.

049. Sherasia, P.L.; National Dairy Development Board, Anand (India). Animal Nutrition Group. Garg, M.R.; National Dairy Development Board, Anand (India). Animal Nutrition Group. Bhanderi, B.M.; National Dairy Development Board, Anand (India). Animal Nutrition Group. Effect of feeding slow ammonia release and protected protein supplement in lactating cows and buffaloes. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 168-171 KEYWORDS: COWS. WATER BUFFALOES. PROTEIN CONCENTRATES. CONTROLLED RELEASE. CONCENTRATES. FEEDING.

050. Kulkarni, R.C.; Central Avian Research Institute, Izatnagar (India). Shrivastava, H.P.; Central Avian Research Institute, Izatnagar (India). Mandal, A.B.; Central Avian Research Institute, Izatnagar (India). Effect of copper supplementation on serum trace mineral status and cholesterol in broiler chickens. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 313-314 KEYWORDS: BROILER CHICKENS. SUPPLEMENTS. CHOLESTEROL. MINERAL CONTENT.
The aim of the present study was to see the effect of dietary copper (Cu) on serum trace mineral and cholesterol status in broiler chickens. As the level of Cu was increased in diet a significantly higher Cu with lower iron (Fe) and Manganese (Mn) content in serum was noticed. Further, the chicks fed copper propionate had a significantly higher serum Cu as compared to its counterpart receiving the diet with copper sulphate. The serum Fe content was comparable between two sources of dietary Cu but the serum Mn was significantly higher in copper sulphate than that of copper propionate fed group. The addition of copper sulphate brought significantly

higher serum zinc (Zn) as compared to that of copper propionate, whereas the total cholesterol content in serum remains uninfluenced by Cu diets.

051. Grewal, R.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Wadhwa, M.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Bakshi, M.P.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Effect of Metabolizable Energy and Rumen Undegradable Protein Levels Supplemented With or Without Vitamins on the Performance of Crossbred Cows during Transition Phase. Indian Journal of Animal Nutrition (India). (Mar 2012) v. 29(1) p. 1-8 KEYWORDS: COWS. CROSSBREDS. SUPPLEMENTS. SUPPLEMENTARY FEEDING. VITAMINS. RUMEN DIGESTION.

The present study was conducted to assess the effect of rations containing different levels of metabolizable energy (ME) and rumen undegradable protein (UDP) supplemented with vitamins on the productive performance of crossbred cows during transition phase. Twenty four crossbred dairy cows divided into 4 equal groups were offered iso-nitrogenous complete feeds containing either LME-LUDP (ME-100% of NRC and UDP-24% of CP), MME-LUDP (ME-110% of NRC and UDP-24% of CP), HME-LUDP (ME-120% of NRC and UDP-24% of CP) or HME-HUDP-V (ME-120% of NRC, UDP-40% of CP supplemented with biotin, niacin and vitamin E) from 40 days pre-partum through 100 days post partum. The blood and spot urine samples were collected on -40, -30, -20, -10, -5, -3, 0, 3, 5, 10, 20, 30, 40, 60, 80, and 100 days post calving. The DM consumption (irrespective of the stage of transition phase) by cows in HME-HUDP-V group was higher (P0.05) than those in HME-LUDP group, but was comparable with those in LME-LUDP and MME-LUDP groups. The DM intake, irrespective of the dietary combination was lower (P0.05) during prepartum period than that compared to the postpartum period. The body condition score of animals offered MME-LUDP, HME LUDP or HME-HUDP-V diet was comparable, but higher (P0.05) than those offered LME-LUDP diet. The digestibility of DM (P0.05) and NDF (P0.05) were higher in HME-HUDP-V group as compared to other groups. The blood profile was not affected by dietary combinations, but the blood urea nitrogen (BUN) was lowest in HME-HUDP-V group. The blood glucose was higher (P0.05) at 0 d as compared up to 30 day postpartum. The dietary combinations did not have any impact on the daily milk yield,

but it showed increasing trend in HME-HUDP-V group. Similar trend was observed in lactose content. The peak yield was achieved around 60 day postpartum, thereafter, the milk yield started declining, but the differences were statistically non-significant. It was concluded that the diet containing ME-120% of NRC with 40% UDP of dietary CP supplemented with niacin, biotin and vitamin E (HME-HUDP-V) exhibited best response on the performance of high yielding crossbred cows, but UDP beyond 24% of CP did not have any significant beneficial effect.

052. Grewal, R.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Wadhwa, M.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Bakshi, M.P.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Effect of Metabolizable Energy and Rumen Undegradable Protein Levels Supplemented With or Without Vitamins on in vitro Fermentation of Complete Feeds. Indian Journal of Animal Nutrition (India). (Mar 2012) v. 29(1) p. 9-14 KEYWORDS: COWS. CROSSBREDS. SUPPLEMENTARY FEEDING. VITAMINS. RUMEN DIGESTION. DIGESTIBILITY. IN VITRO EXPERIMENTATION.

The present study was conducted to assess the effect of different levels of metabolizable energy (ME) and rumen undegradable protein (UDP), with or without niacin and vitamin E supplementation on the in-vitro fermentation of complete feeds. Nine isonitrogenous complete feeds containing 3 levels each of ME 100 (LME), 110 (MME) and 120% (HME) of NRC feeding standard for dairy cattle and UDP [24 (LUDP), 32 (MUDP) and 40% (HUDP) of CP (16.8%)] with or without vitamin E and niacin were arranged in a 3 x 3 x 2 x 2 factorial design. Irrespective of UDP levels and vitamins, the net gas production (NGP) and digestibility of OM and NDF improved (P0.05) with the increase in the levels of ME. But, with the increase in UDP levels, reverse trend (P0.05) was observed in NGP, OM digestibility, ammonical-N and ME availability. Supplementation of diets with vitamins (irrespective of ME and UDP levels) improved (P0.05) the NGP, digestibility of nutrients and ME availability as compared to unsupplemented diet. It was observed that irrespective of ME and UDP levels, the diet supplemented with niacin resulted in higher (P0.05) NGP, digestibility of nutrients and availability of ME as compared to vitamin E supplemented diet. Interactions between energy and UDP levels; energy and type of vitamin were significant (P0.05).

The results revealed that MME-LUDP, HME-LUDP and HME-HUDP gave the best (P0.05) response. The effect of niacin at medium and high energy levels was more pronounced (P0.05). It was concluded that diet containing ME at 110 or 120% of NRC with low UDP (24% of dietary CP) supplemented with niacin gave the best response as far as digestibility of nutrients and availability of ME was concerned.

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053. Baskar, Arul; S. B. K. College, Aruppukottai (India). Department of Zoology. drarulbaskarmail.com. Ambrose, D. P.; St. Xavier's College, Palayamkottai (India). Entomology Research Unit. Tirumurugaan, K. G.; Madras Veterinary College, Chennai (India). Department of Animal Biotechnology. Fleming, A. T.; Loyola College, Chennai (India). Department of Advanced Zoology and Biotechnology. Genetic diversity in the assassin bug Rhynocoris marginatus fabricius (heteroptera: Reduviidae), based on RAPD analysis. Indian Journal of Entomology (India). (June 2013) v.75(2)p.146-153 KEYWORDS: HETEROPTERA. GENETIC RESOURCES. RAPD.
The present paper includes the results of RAPD-PCR based molecular genetic diversity of three populations of Rhynocoris marginatus Fabricius. The in vitro enzymatic amplification of genomic DNA derived from homogenized adult males and females was carried out by using three random oligonucleotide primers, respectively. The results were analysed by using standard gene ruler and by the application of suitable software programme by considering two parameters of study i.e., band sharing analysis and dendrogram of genetic relatedness. As a result of this research it was noticed that primer OPA-2 was most reliable because, on the basis of the DNA profiles with this primer, all the male and female of the populations of R. marginatus could be two main clusters and two subclusters together. The band sharing coefficient value of 1 indicated maximum similarity between all the three populations of R. marginatus with primer OPA-2. In this respect the results revealed in dendrogram and band sharing coefficient confirm the status of genetic kinship of inter-and intraspecific nature.

054. Kale, D.S.; National Dairy Research Institute, Karnal (India). Yadav, B.R.; National Dairy Research Institute, Karnal (India). Effect of DNA polymorphism in Butyrophilin gene on milk yield in Murrah buffalo (Bubalus bubalis). Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1068-1072 KEYWORDS: WATER BUFFALOES. DNA. POLYMORPHISM.

GENES. MILK YIELD.

DNA polymorphism of Butyrophilin gene was analyzed using PCR-RFLP, SSCP and to find possible relationship (if any) of identified polymorphism with milk production traits in Murrah buffalo. Genomic DNA was isolated from 110 Murrah from Institute’s herd. The PCR-RFLP polymorphism analysis of Butyrophilin gene using TaqI, MboI and HaeIII restriction enzymes revealed single restriction pattern indicating absence of variation in buffalo. The PCR-SSCP analysis of intron 3 and 4 exhibited monomorphic SSCP patterns. However, intron 1 region of Butyrophilin revealed polymorphic BTI1SSCP with 3 patterns. The identified buffalo butyrophilin variants were found with following frequencies: A, 0.6; B, 0.31 and C, 0.09 in Murrah buffaloes. The direct DNA sequencing of 3 polymorphic SSCPs within Murrah buffalo Butyrophilin gene revealed BTI1 SNP (c.184CTG) confirming 3 variants, viz. A, B and C. The statistical analysis indicated BTI1TT SNP genotypes were significantly associated with 305 days lactation milk yield of Murrah buffaloes. The Murrah buffaloes with BTI1TT SNP genotypes had 683.93 kg and 320.48 kg higher milk yield as compared to BTI1CT and BTI1CG SNP genotypes respectively. The identified association of BTI1TT SNP genotypes with milk yield after validation in large population with more records will be useful for designing selection and breeding strategies for genetic improvement of buffaloes for milk production.

055. Reddy, B.L.N.; Central Avian Research Institute, Izatnagar (India). Rajvir Singh; Central Avian Research Institute, Izatnagar (India). Kataria, M.C.; Central Avian Research Institute, Izatnagar (India). Time trends in genetic parameter estimates of production traits in White Leghorn chicken under long-term selection. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1073-1075 KEYWORDS: BROILER CHICKENS. GENETIC PARAMETERS. HERITABILITY. SELECTION.

In the present study, nonsignificant negative-time trends for heritability estimates were obtained for the majority of the traits. It indicated that additive genetic variance of the traits in the population was reduced, but not significantly due to selection for egg production. Time trends in genetic and phenotypic correlations were mostly nonsignificant indicating that the association between different traits did not change significantly due to selection over generations.

056. Thiruvenkadan, A.H.; Tamil Nadu Veterinary and Animal Science University, Namakkal (India). Performance of Murrah buffaloes at coastal region of Tamil Nadu, India. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1080-1083 KEYWORDS: WATER BUFFALOES. ANIMAL PERFORMANCE. TAMIL NADU.

The present study was made to study the performance of Murrah buffaloes purchased from its breeding tract at coastal region of Tamil Nadu to assess any genotype × environment interaction in production traits. The study revealed that non-genetic factors such as period and season of calving had highly significant effect on all the traits studied. In general, the milk production performance of the Murrah buffaloes purchased from its breeding tract and reared at coastal region of Tamil Nadu was comparable with those maintained under other government and institutional herds in India, indicating that there might not be any appreciable genotype × environment interaction.

057. Brah, G.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Chaudhary, M.L.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Bajwa, I.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Evaluation of embryonic malformations in pure strains of White Leghorn and their reciprocal crosses. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1182-1185 KEYWORDS: CHICKENS. ANIMAL EMBRYOS. RECIPROCAL CROSSING.

The incidence of embryonic malformation expressed on the basis of total eggs set varied between 1.14 and 2.84% in different genetic groups. Of all the malformed embryos, the percentage of beak defects, eye defects and brain hernia varied from 37.8 to 60.0; 15.2 to 18.7 and 20.8 to 23.1 respectively. Pooled over genetic groups, the beak defects exhibited the highest anomaly (51.4%) followed by hernia 26.1%). Other anomalies which occurred with low frequencies were limb defects, absence of head, body edema, and twin embryos with common yolk, four legged and fourwinged monsters, talpid like syndrome and a three-legged alive chick. It is felt that application of cytogenetical and embryological methods may be of major relevance in studying embryonic mortality vis-a-vis genetic background and improvement of the reproduction traits of poultry species.

058. Chaudhari, C.F.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Prajapati, K.R.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Patel, D.M.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Patel, V.M.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Patel, T.J.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Chaudhari, A.S.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Sipai, R.S.; Pashu Samvardhan Kendra, Dudhsagar Research and Development Association, Dudhsagar Dairy, Mehsana (India). Relationship between hypo-osmotic swelling response of spermatozoa with post-thaw motility in crossbred bulls. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1219-1221 KEYWORDS: BULLS. CROSSBREDS. ARTIFICIAL INSEMINATION. FREEZING. BIOLOGICAL PRESERVATION. SEMEN PRESERVATION.

The relationship between hypo-osmotic swelling test with post-thaw motility in crossbred bulls was studied. The samples with 50% (110) and 60% (43) PTM were examined for HOST. Sperms with various types of curling patterns were considered as reacted and sperms with no swelling/curling were considered as non-reacted. With higher motility the HOS reacted sperms were increased in count. Positive correlation between the % of post thaw motility of spermatozoa and the spermatozoa that reacted to the hypoosmotic swelling test was observed. In addition to post-thaw motility, hypo-osmotic swelling test can be used as a regular mbase test to judge the best quality cryo-preserved semen for artificial insemination programme. Further studies are required to find out the relationship of these two tests with the field fertility.

059. Sharief, M.; Sher-e-Kashmir University of Agricultural Science and Technology, Ladakh (India). Sheikh, F.D.; Sher-e-Kashmir University of Agricultural Science and Technology, Ladakh (India). Reproductive performance of Changthangi Pashmina goats. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1253-1254 KEYWORDS: GOATS. WOOL PRODUCING ANIMALS. REPRODUCTIVE PERFORMANCE.

The study was under taken to establish a base data generation regarding the production parameters of Pashmina

goats in its native tract. Its reproductive performances in the extreme cold condition of the region, are appreciable. Around 500 pashmina goats from different areas of Changthang region of Leh district were randomly accessed for its reproduction performance. LSM method was used to find out the different reproductive traits. The overall age at first tupping was recorded as 550.33±7.12, with an overall age at first kidding as 699.44±10.23 days. The gestation period was noted as 151.08±0.5 days. The average birth weight in this breed was recorded as 2.32±0.25 and 2.179±0.19 in male and females respectively. A litter size of 1.02±0.50 indicates nature’s own way for survivability in this region. However the kidding % in this breed of goat was 97.58±2.23. It was also observed that the type of birth has a significant influence on birth weight.

060. Deen, Aminu; Central Sheep and Wool Research Institute, Avikanagar (India). Reproductive Performance in Camel (Camelus dromedarius). Camel: An International Journal of Veterinary Sciences (India). (Jan 2013) v. 1(1) p. 13-27 KEYWORDS: CAMELS. SEMEN. SEMEN COLLECTION. REPRODUCTIVE PERFORMANCE.

The study was conducted to explore various aspects of reproduction in camels viz. Effect of breed on fertility, effect of repeat services during same estrous period on pregnancy rate, effect of copulation time on fertility in female dromedary camels, early versus late onset of sexual libido in males, male fertility and investigations into mating ability, semen donation efficiency in Artificial Vagina, gross characteristics of semen ejaculate, individual sperm motility examination and morphological evaluation of spermatozoa of sterile male camels. Bikaneri breeds of camels exhibited greater First service and overall conception rate as compared to Jaisalmeri and Kachchi breeds. Infertile females were also lesser in Bikaneri breed than Kachchi and Jaisalmeri. Repeated services during the same estrus period had no beneficial effect on pregnancy rate over single service, when females were selected for follicular phases prior to breeding. Copulation time did not vary significantly between males for single service, however few significant differences between males were observed in multiple services during same estrus period. Copulation time for the breeding resulting into successful or unsuccessful conception did not differed significantly. Late manifestation of sexual libido was observed in males, which was correlated with delayed onset of circulating testosterone rise. The fertility rate of males differed between breeds ranging 40–58, 10–33.3 and 0–100%

in Bikaneri, Jaisalmeri and Kachchi breeds. Subfertility in ¾ Jaisalmeri studs and sterility in 2/4 Kachchi studs was recorded. Mating ability of sterile males was not lower than fertile males. Gross characteristics and individual sperm motility examinations for one of the two sterile male camels had been perfectly normal, while another sterile male had watery ejaculates with nil individual sperm motility on all occasions except once. Morphology of spermatozoa of sterile male camels had been poor. It is concluded that selection of females for follicular phases prior to mating omit the repeated services during the same estrus period without affecting the pregnancy rates. Late manifestation of sexual libido in males was correlated with late arousal of endocrine surge. Copulation time was not significantly different for successful and unsuccessful conceptions. Significant proportions of male studs were found subfertile and sterile.

061. Mishra, A.K.; Central Avian Research Institute, Izatnagar (India). Kumar, Sushil; Project Directorate on Cattle, Meerut Cantt (India). Sheep breeding programmes in India. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 1-15
KEYWORDS: SHEEP. CROSSBREEDING. WOOL.
The breeding policy for sheep is primarily aimed for increasing wool and meat production for meeting demand in the country. Organized sheep development activity was started in 19th century; however, major emphasis was given after the establishment of Indian Council of Agricultural Research, New Delhi and launching of the Five-Year Plans. The hallmark was the establishment of Central Sheep and Wool Research Institute, Avikanagar (Rajasthan) in 1962. The All India Coordinated Projects on sheep breeding was launched in 1971 to evolve ideal breeds suitable for different agro-climatic conditions. A number of sheep strains/breeds e.g., Hissardale, Kashmir Merino, Nilgiri Synthetic, Bharat Merino, Avikalin, Avivastra, Avimaans, Patanwadi synthetic, etc have been evolved. In 1990, the Network Project on Sheep Improvement was initiated for survey, evaluation and improvement of indigenous sheep. Different breeds of sheep are being improved through selection. The role of crossbreeding for evolving new strains and performance of indigenous and crossbreds evolved in different environmental conditions of the country are reviewed. In some of the programmes, small population size was major inhibitor of genetic improvement. The success rate of some breeding programmes involving native breeds is encouraging.

062. Malik, Geetu; National Bureau of Animal Genetic Resources, Karnal (India). Gupta, S.C.; National Bureau of Animal Genetic Resources, Karnal (India). Gupta, Neelam; National Bureau of Animal Genetic Resources, Karnal (India). Single nucleotide polymorphism of KAP6.1 gene in jaiselmeri sheep - A carpet wool breed of western Rajasthan. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 26-31 KEYWORDS: SHEEP. LAND RACES. NUCLEOTIDE SEQUENCE. POLYMORPHISM. WOOL.

The variation in Jaiselmeri sheep breed at KAP6.1 gene was investigated using PCR-Single Strand Conformation Polymorphism (SSCP) and DNA sequencing. Three PCR-SSCP haplotypes W, X and Y were identified in 252 bp DNA segment covering the entire coding sequences (CDs) from 50 sheep samples collected at random. The W (wild) type having DNA sequence similar to GenBank reference (accession no. M95719) were most abundant (92%), while X and Y mutants were 4% each. The X type (accession no. FJ712681) showed A/G base substitution at 176 nucleotide position, resulted it to change from tyrosine (Y) to cystine (C) at codon 59. The Y haplotype (accession no. FJ712675) sequence showed synonymous mutations T/C, C/G, T/C, C/T, C/G, C/T and C/A at nucleotide positions 27, 30, 57, 64, 75, 109 and 126, respectively. The most interesting part of the study is a major deletion of 36 nucleotides from position 154–189, resulting into loss of amino acids from glycine (G) to serine (S) at codons from 56–67, respectively. This deletion was clearly amplified by fast moving SSCP conformer on gel. This mutation is novel in KAP6.1 gene of sheep and it is now in public domain. This study would lead to screening of these SNPs in large sheep population for any possible association with wool yield or processing properties.

063. Manokaran, S.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Veerapandian, C.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Balasubramanian, S.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. In vitro fertilization of sheep oocytes matured in two different media. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 44-46 KEYWORDS: SHEEP. IN VITRO FERTILIZATION. OVA.

The objective of the study was to assess the in vitro fertilization rate of sheep oocytes collected from ovaries at slaughterhouse using two media. Sheep oocytes were

collected by slicing technique from ovaries and in vitro maturation (IVM) was carried out in tissue culture medium 199 (TCM 199) and Ham's F-10 medium supplemented with follicle stimulating hormone (FSH), luteinizing hormone (LH), 17-ß oestradiol and fetal calf serum (FCS). IVM was assessed based on cumulus cell expansion and first polar body extrusion. There was no significant difference between the two media for the maturation of sheep oocytes and overall maturation rate ranged from 89.18 (Ham's F-10) to 92.23% (TCM 199). The matured oocytes were fertilized in vitro in modified Tyrode's medium by co-incubating with sperms capacitated with 200 µg/ml of heparin. The fertilization rate was assessed by cleavage rate of oocytes in TCM 199 and Ham's F-10 which was 27.94 and 16.18%, respectively. The cleavage rate was significantly (P0.01) higher in TCM 199 than in Ham's F-10 medium.

064. Saraswat, Sonia; Central Institute for Research on Goats, Makhdoom (India). Physiology, Reproduction and Shelter Management Division. Jindal, S.K.; Central Institute for Research on Goats, Makhdoom (India). Physiology, Reproduction and Shelter Management Division. Ramachandran, N.; Central Institute for Research on Goats, Makhdoom (India). Physiology, Reproduction and Shelter Management Division. Yadav, Sushma,; Central Institute for Research on Goats, Makhdoom (India). Physiology, Reproduction and Shelter Management Division. Priyadharsini, R.; Central Institute for Research on Goats, Makhdoom (India). Physiology, Reproduction and Shelter Management Division. Standardization of antioxidants fortification in frozen buck semen. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 47-51 KEYWORDS: GOATS. SEMEN PRESERVATION. ANTIOXIDANTS.

The effects of different levels of three antioxidants viz., reduced glutathione (3, 5, 7 and 9 mM), ascorbic acid (3, 5, 7, 9 and 10mM), ¨¢-tocopherol (1.5, 2.5, 3.5, 4.5 and 5.5 mM) were evaluated individually on initial, post-equilibration and post-thaw progressive motility in Sirohi buck semen. Ten ejaculates having the volume ¡Ý 0.5 ml, mass motility ¡Ý +3.0 and the initial progressive motility ¡Ý 60.00% were processed for freezing for each antioxidant fortification. The addition of all three additives improved the mean per cent initial, post-equilibration and post-thaw progressive motility of spermatozoa. The-post thaw progressive motility for 0, 3, 5, 7 and 9 mM concentration of reduced glutathione was recorded as 26.50, 24.90, 28.50, 32.00 and 28.80%, respectively. Similarly, the post-thaw progressive motility on

addition of ascorbic acid at 0, 3, 5, 7, 9 and 10 mM level was 23.60, 25.00, 26.60, 30.40, 37.00 and 36.90%, respectively. The post-thaw progressive motility at 0, 1.5, 2.5, 3.5, 4.5 and 5.5 mM level of ¨¢-tocopherol was 23.10, 26.20, 26.70, 32.00, 37.00 and 26.70%, respectively. The results indicated that individual antioxidant levels of 7 mM reduced glutathione, 9 mM ascorbic acid and 4.5 mM ¨¢tocopherol showed higher post-thaw progressive motility of Sirohi buck semen compared to other levels studied.

065. Kumar, Upendra; Rajasthan University of Veterinary and Animal Sciences, Vallabhnagar (India). Livestock Research Station. Nagda, R.K.; Rajasthan University of Veterinary and Animal Sciences, Vallabhnagar (India). Livestock Research Station. Sharma, S.K.; Rajasthan University of Veterinary and Animal Sciences, Vallabhnagar (India). Livestock Research Station. Reproductive status of sirohi goats under field conditions. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 143-144 KEYWORDS: GOATS. REPRODUCTIVE PERFORMANCE. RAJASTHAN.

Data on reproductive traits of the Sirohi goats were recorded during the years 2002–2008. Abortions and stillbirths were the highest (11.70%) during 2005 and the lowest (4.35%) during 2008. Twining and triplet percentages ranged between 11.76 and 27.15 and from 0 to 1.10, respectively. The overall least squares means for age at first service, age at first kidding, weight at first service and weight at first kidding were 513.70±9.01days, 662.92±9.23 days, 26.25±0.12 kg and 28.63±0.12 kg, respectively.

066. Balasubramanyam, D.; Livestock Research Station, Kattupakkam (India). Raja, T.V.; College of Veterinary and Animal Sciences, Pookot (India). Kumarasamy, P.; Livestock Research Station. Kattupakkam (India). Sivaselvam, S.N.; Madras Veterinary College, Chennai (India). Estimation of genetic parameters and trends for body weight traits in madras red sheep. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 173-179 KEYWORDS: SHEEP. LAND RACES. GENETIC PARAMETERS. BODY WEIGHT. TAMIL NADU.

The present investigation was undertaken to estimate the genetic and phenotypic parameters and trends for different body weight traits of Madras Red sheep. A total of 5491 records (1843 males and 3648 females) of Madras Red sheep sired by 98 rams and spanning a period of 13 years (1996–2008) were collected from different farmers’ flock in the breeding tract. The overall average body weights at birth,

3, 6, 9 and 12 months of age were 2.76, 9.90, 14.53, 18.16 and 21.05 kg, respectively. Sex of lamb and year of lambing had highly significant (P0.01) effect on all the traits studied. The effect of season of lambing was significant for weight at birth (P0.01), 3 and 6 months ((P0.05) and no effect at 9 and 12 months of age. The regression of birth weight on dam's body weight at lambing was significant (P0.05). Heritability estimates for birth, weaning and yearling weights were 0.087, 0.405 and 0.665, respectively. The genetic correlations among all the body weights were significantly different from zero except for birth and 6 months weights. The positive and moderate to high genetic correlations among most of the body weight traits indicate the possibility of correlated responses through multiple trait selection. A significant (P0.01) genetic trend was observed for 12 months body weight with an average of 123.20 g per year indicating that the selection process was effective for 12 months body weight. The significant positive phenotypic trend for birth weight indicates that environment plays a major role, which is supported by a lower heritability estimate for the trait. From the above results, it may be inferred that the selection criteria adopted in the study area gave more emphasis to weaning (3 months) and adult weight (12 months) than other body weight traits studied.

067. Biswas, R.K.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Deka, B.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Animal Reproduction, Gynaecology and Obstetrics. Effect of certain additives on in vitro maturation of goat oocytes in different culture media. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 202-206 KEYWORDS: GOATS. OOCYTE PRESERVATION. OVA.

Goat follicular oocytes recovered by dissection of ovaries obtained from abattoir immediately after slaughter were incubated in vitro at 39° C for 28 h in humidified carbon -di - oxide atmosphere using Dulbecco's Phosphate Buffer Saline (DPBS) and Tissue Culture Medium-199 (TCM-199) - based culture media containing non-hormonal additives to record the extent of oocyte maturation. The incidences of metaphase I and metaphase II in oocytes were significantly (P0.05) higher in TCM-199 (58.19%, 31.08%, 61.18%, 36.47%) than in DPBS medium (39.39%, 15.15%, 41.33%, 18.67%) when both contained 1 or 3% Bovine Serum Albumin (BSA), granulosa cells and 500 ìg sodium pyruvate, 125 ìg sodium

lactate and 200 ìg heparin/ml of media. Replacing BSA with heat-inactivated 20% non-oestrous or oestrous goat serum had no significant effect on the rate of in vitro maturation (IVM) of oocytes. It was concluded that the rate of IVM of goat oocytes could be enhanced by 1 or 3% BSA, granulosa cells, sodium pyruvate (500 ìg), sodium lactate (125 ìg) and heparin (200 ìg)/ml of medium in TCM-199.

068. Laxmi, P Jaya; NTR College of Veterinary Science, Gannavaram (India). Department of Animal Genetics and Breeding. Gupta, B. Ramesh; NTR College of Veterinary Science, Gannavaram (India). Department of Animal Genetics and Breeding. Chatterjee, R.N.; Project Directorate Poultry, Hyderabad (India). Sharma, R.P.; NTR College of Veterinary Science, Gannavaram (India). Department of Animal Genetics and Breeding. Reddy, V. Ravinder; NTR College of Veterinary Science, Gannavaram (India). Department of Animal Genetics and Breeding. Inheritance of certain immune response traits in IWI strain of white leghorn. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 152-155 KEYWORDS: CHICKENS. GENETIC CORRELATION. IMMUNE RESPONSE.
Genetic parameters were studied for the three immune response traits viz., antibody response to SRBC injection, antibody response against New Castle Disease Virus (NDV) vaccine and cell mediated immune response to PHA-P injection in IWI strain of White Leghorn. The heritability was 0.362, 0.017 and 0.506 for antibody response to SRBC injection, antibody response against New Castle disease virus (NDV) vaccine and cell mediated immune response to PHA-P injection respectively. The genetic correlation of antibody response to SRBC injection with age at first egg was negative and low while with egg production and egg weight at various ages, it was positive indicating an improvement in egg production and egg weight along with improvement in humoral immune response to SRBC. The genetic and phenotypic correlation with cell mediated response to PHA-P was positive suggesting the possibility of simultaneous improvement of both humoral and cell mediated immunity. The genetic correlation of antibody response to NDV vaccine with body weight and egg weight at various ages was variable while it was positive with the egg production upto 40 weeks of age and cell mediated immune response to PHA-P. The cell mediated immune response to PHA-P was positively correlated with age at first egg while it was negatively correlated with body weight and egg weight at genetic level.

069. Malarmathi, M.; Sri Venkateswara Veterinary University, Hyderabad (India). College of Veterinary Science, Department of Animal Genetics and Breeding. Gupta, B. Ramesh; Sri Venkateswara Veterinary University, Hyderabad (India). College of Veterinary Science, Department of Animal Genetics and Breeding. Prakash, M. Gnana; Sri Venkateswara Veterinary University, Hyderabad (India). College of Veterinary Science, Department of Animal Genetics and Breeding. Reddy, A. Rajashekar; Sri Venkateswara Veterinary University, Hyderabad (India). College of Veterinary Science, Department of Animal Genetics and Breeding. Genetic study on production traits of Japanese quails. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 164-167 KEYWORDS: QUAILS. HERITABILITY. WEIGHT GAIN.

070. Hussain, Jakir; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Roychoudhury, R.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Das, G.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Mili, D.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Goswami, R.N.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Reproductive performance of dairy cows under field condition of Assam state. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 180-183 KEYWORDS: COWS. CROSSBREDS. REPRODUCTIVE PERFORMANCE. GESTATION PERIOD. LAND RACES. ASSAM.

The data was generated on field scale by personal interviews with the livestock owners in Assam. The least square means of service period, gestation period and calving interval for Jersey X Local cows were 118.33 ± 1.63, 275.74 ± 0.46 and 393.68 ± 1.64 days, respectively. The corresponding values for Holstein Friesian X Local were 146.96 ± 1.85, 275.81 ± 0.53 and 422.26 ± 1.85 days and that of Local cows as 265.06 ± 1.87, 274.12 ± 0.53 and 538.32 ± 1.85 days, respectively. The effect of genetic group, season of calving and parity was highly significant (p0.01) on service period and calving interval. The gestation period was significantly (p0.05) influenced by genetic group.

071. Patil, C.S.; National Dairy Research Institute, Karnal (India). Dairy cattle Breeding Division. Chakravarty, A.K.; National Dairy Research Institute, Karnal (India). Dairy cattle Breeding Division. Kumar, Vijay; National Dairy Research Institute, Karnal (India). Dairy cattle Breeding Division. Dongre, V.B.; National Dairy Research Institute, Karnal (India). Dairy cattle

Breeding Division. Kumar, Pankaj; National Dairy Research Institute, Karnal (India). Dairy cattle Breeding Division. Non-Genetic Factors Affecting First Lactation Reproductive Traits in Murrah buffaloes. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 205-207 KEYWORDS: WATER BUFFALOES. GENETIC CORRELATION. GENETIC INHERITANCE. REPRODUCTIVE PERFORMANCE.

In the present investigation, the effect of non genetic factors on performance of various first lactation reproduction traits in Murrah buffaloes has been studied. In this study 707 first lactation production records of Murrah buffaloes maintained at National Dairy Research Institute (NDRI), Karnal were collected and analysed. The present study revealed that the overall least-squares means for age at calving was estimated as 44.85 ±0.13 months for first lactation in Murrah buffaloes. The overall least-squares means for First Service Period (FSP) was estimated as 161.65±4.60 days for first lactation in Murrah buffaloes. The overall least-squares means for number of services per conception (NS/C) was estimated as 1.92±0.75 days for first lactation in the present study. In Murrah buffaloes, the overall least-squares means for Waiting Period (WP) or days to first service (DFS) was estimated at 107.09 ±3.40 days for first lactation in Murrah buffaloes.

072. Balasubramaniam, Sivamani; Indian Veterinary Research Institute, Izatnagar (India). Animal Genetic Division. Singh, Mohan; Indian Veterinary Research Institute, Izatnagar (India). Animal Genetic Division. Kumar, Subodh; Indian Veterinary Research Institute, Izatnagar (India). Animal Genetic Division. Comparison of correction factors for age at first calving in sahiwal cows. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 253-257 KEYWORDS: COWS. REPRODUCTIVE PERFORMANCE. PERFORMANCE TESTING.

A total of 403 first lactation records of Sahiwal cows sired by 30 bulls, spread over 53 years maintained at Government Cattle Breeding Farm, Anjora, Durg were utilized to develop additive (ACF) and multiplicative (MCF) age correction factors for first lactation 305 days milk yield. The MCFs were found to be more effective for correcting the data on the basis of mean, coefficient of variation, between class variance and F ratio.

073. Sanker, Shashi; Bihar Veterinary College, Patna (India). Mandal, K.G.; Bihar Veterinary College, Patna (India). Kumar, Dhirendra; Bihar Veterinary College, Patna (India). Mahajan, V.; SKUAST, Jammu (India). Div. Animal Bredding & Genetics. Kumar, Nishant; Bihar Veterinary College, Patna (India). Factors influencing peak yield and days to attain peak yield in different grades of buffaloes. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 288-291 KEYWORDS: WATER BUFFALOES. GENETIC CORRELATION. LACTATION. MILK PERFORMANCE.

Data on 920 buffaloes were analyzed for peak yield and days to attain peak yield consisting of three Genetic groups viz. Graded Murrah, Diara buffaloes and non-descript buffaloes. Buffaloes were enumerated from 145 dairy units located in and around Patna Bihar. Genetic groups had shown highly significant (p0.01) influence on both the traits. Peak yield varied as 8.78(lit.) in Graded Murrah, 7.80(lit.) in Diara buffalo and 7.07(lit.) in non-descript ones. Farming system and lactation order had significant influence (p 0.01) peak yield which varies from 7.73 lit (animal husbandry alone) to 8.04 lit. (mixed farming) and 5.82 lit. (1st lactation) to 9.40 lit. (3rd lactation). Farming system and lactation order did not show significant effect on days to attain peak yield, while location had non-significant effect on both the traits.

074. Lalrintluanga, K.; Central Agricultural University, Aizawl (India). CVSC & AH, Deptt. of Animal Reprod. Gynae. & Obstetrics. Deka, B.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Nath, K.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Bhuyan, D.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Ali, M.A.; Central Agricultural University, Aizawl (India). CVSC & AH, Department of LPMSarma, S.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Effect of extenders on the extra cellular activity of transaminases in boar semen during preservation. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 295-297 KEYWORDS: BOARS. SEMEN. SEMEN PRESERVATION. ASPARTATE AMINOTRANSFERASE.

A total of 24 ejaculates obtained from 7 Large White Yorkshire (LWY) boars were used by split sample technique for studying the effect of four extenders on the extracellular activity of transaminases in boar semen during preservation at 18°C for 72 hours using Beltsville Thaw Solution (BTS), Androhep, Fructose Egg Yolk (FEY) and Glucose Potassium Sodium tartrate Sodium citrate edate extender (GPSE)

extenders. The mean extracellular activity of aspartate aminotransferase (AST) in BTS, Androhep, GPSE and FEY extenders at 18°C. were 15.51 ± 1.42, 14.60 ± 1.38, 14.56 ± 0.99 and 15.73 ± 1.51 unit/ml, respectively at 0 hour and 29.16 ± 2.39, 28.75 ± 1.97, 31.40 ± 1.62 and 33.11 ± 2.37 unit/ml respectively at 72 hours. The mean extracellular Alanine aminotransferase (ALT) activity were 3.64 ± 0.70,3.60 ± 0.67,4.31 ± 0.81 and 4.09 ± 0.59 unit/ml respectively at 0 hour and 13.24 ± 1.61, 12.25 ± 1.22, 14.61 ± 1.77 and 16.03 ± 1.95 unit/ml respectively at 72 hours. The AST and ALT activity did not vary significantly between extenders. However, the AST and ALT activity varied significantly (P0.01) between preservation periods but not due to interaction between extender and preservation period.

075. Khan, M.H.; ICAR Research Complex for NEH Region, Umiam (India). Nath, K.C.; ICAR Research Complex for NEH Region, Umiam (India). Deka, B.C.; ICAR Research Complex for NEH Region, Umiam (India). Naskar, S.; ICAR Research Complex for NEH Region, Umiam (India). Bardoloi, R.K.; ICAR Research Complex for NEH Region, Umiam (India). Bhuyan, D.; ICAR Research Complex for NEH Region, Umiam (India). Suresh Kumar; ICAR Research Complex for NEH Region, Umiam (India). Effect of different extenders on cryopreservation of Hampshire and crossbred boar semen. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 24-27 KEYWORDS: SWINE. BOARS. SEMEN PRESERVATION. FREEZING. BIOLOGICAL PRESERVATION.

The comparative efficacy of extenders, viz. LEYG (lactose egg yolk glycerol), BTSLEYG (Beltsvilli thawing solution lactose egg yolk glycerol), KEYG (Kiev egg yolk glycerol) and BTSEYG (Beltsvilli thawing solution egg yolk glycerol) were evaluated for cryopreservation of boar semen. Sperm rich fraction of ejaculates (12 each from 3 Hampshire and 3 crossbred boars) were collected by gloved-hand method using dummy sow. Ejaculates having more than 75% initial motility were taken for the study. Each ejaculate was divided in to 4 aliquots and processed with 4 different extenders using 3 h holding time and 1 h equilibration period and frozen in liquid nitrogen using 0.5 ml french medium straws. Each sample was evaluated just after collection and 24 h post-thawing for initial motility, live sperm count, acrosomal integrity and HOST reacted spermatozoa. Results revealed that out of 4 extenders, BTSLEYG was superior than LEYG, KEYG and BTSEYG in respect of post-thawing sperm motility (51.38±0.87 vs 46.79±1.15, 32.50±0.92, 42.71±0.89%), live sperm count (56.83±0.74 vs 55.37±0.96, 45.75±1.34,

54.83±0.81%), acrosomal integrity (56.83±0.74 vs 55.08±0.96, 43.37±0.70, 54.83±0.81%) and hypo-osmotic-reacted spermatozoa (43.79±0.83 vs 39.00±0.91, 36.37±1.01, 36.41±0.71%) respectively. Therefore, it may be concluded that BTSLEYG can be successfully used for cryopreservation of boar spermatozoa using 3% glycerol concentration with 3 hours holding and 1 h equilibration period.

076. Brah, G.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Chaudhary, M.L.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Saini, Samita; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Bajwa, I.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Phenotypic and genetic evaluation of a randombred control population of White Leghorn over 20 generations. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 74-80 KEYWORDS: CHICKENS. GENETIC CONTROL. GENETIC CORRELATION. POPULATION GENETICS. HERITABILITY. INBREEDING.

Population structure, changes in performance, distribution statistics, heritabilities and genetic and phenotypic correlations among economic traits were studied in a White Leghorn randombred control population over 20 generations. The average number of effective sires and dams were 39.2 and 92.3, providing an effective population size of 183.1. Inbreeding increased at the rate of 0.50% per generation and cumulated to 9.23%. Means of different traits showed wide fluctuations over generations with significant time-trend observed for some traits. These changes could be ascribed to environmental changes as calculated selection differentials for these traits were non-existent. There was no significant change in heritabilities, genetic and phenotypic variances over generations indicating the genetic stability of the line.

077. Singh, Bachuchu; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Tailor, S.P.; Maharana Pratap University of Agriculture and Technology, Udaipur (India). Cumulative milk yield for genetic evaluation of Surti sires. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 87-88 KEYWORDS: SIRE EVALUATION. WATER BUFFALOES. LAND RACES. MILK YIELD. GENETIC CORRELATION. GENETIC PARAMETERS.

The coefficient of variation of cumulative milk yield ranged from 21.80 to 23.05%. The heritability estimates for cumulative milk yield from CMY 60 to CMY were high, significant and varied within a narrow range. The genetic and

phenotypic associations among all the segments of cumulative milk yield were positive and high. All the genetic and phenotypic correlations of TMY and 305FLMY with all segments of cumulative milk yields were also positive and highly significant. The product moment correlation coefficient between breeding value of sires for 305FLMY and cumulative milk yield CMY 60 and CMY 150 were 0.627 and 0.607 respectively. The results of rank and product moment correlation coefficients indicated that initial selection of sires may be done on the basis of either CMY and CMY 90 90 and finally on the basis of first lactation milk yield, where complete records are available.

078. Ghormade, Vaishali; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Parmar, S.N.S.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Thakur, M.S.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Mahajan, Vikas; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Sharma, Gurudutt; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Patel, Mayank; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Chicken growth hormone gene polymorphism and its associations with growth traits. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. KEYWORDS: CHICKENS.

Present study was conducted on chicken growth hormone (cGH) gene polymorphism in Kadaknath, Kadaknath crosses and synthetic colored dual type birds using polymerase chain reaction- restriction fragment length polymorphism (PCRRFLP) method. The 770 bp PCR product was obtained and digested with MspI restriction enzyme. Three different RFLP patterns were obtained at 2 restriction sites corresponding to AA, AB and BB genotypes. The allelic frequencies in indigenous Kadaknath, Kadaknath crosses and synthetic colored dual type birds for A allele were found to be 0.49, 0.64 and 0.46 and for B allele 0.51, 0.36 and 0.54 respectively. The highly significant Chi-square value in Kadaknath crosses showed that the population is not in Hardy Weinberg equilibrium, however non significant. Chi-square value in other two breeds showed that the population is in equilibrium. Among the traits considered the least squares analysis of variance for different genotypes in all the 3 breeds revealed significant differences for adult body weight at 20 weeks and 40 weeks. Genotype AB was superior to AA and BB for adult body weight at 20 weeks and 40 weeks. The significant differences between genotypic least squares means at 20 and 40 weeks of age among all the 3 breeds

indicate the effect of growth hormone gene locus on growth traits. Higher body weight was observed for AB genotype among all the 3 breeds clearly indicating the superiority of AB genotypes than AA and BB genotypes. Hence it is recommended that birds having AB genotype may be selected as parents for future breeding.

L20 Animal ecology

079. Gupta, Ragni; University of Lucknow, Lucknow (India). Department of Zoology. Kanaujia, Amita; University of Lucknow, Lucknow (India). Department of Zoology. Ecology of Eagles in Bundelkhand Region, India. Veterinary World (India). (Jan 2012) v.5(1) p. 31-35 KEYWORDS: EAGLES. ECOLOGY. UTTAR PRADESH.
A preliminary study on eagles in districts of Bundelkhand region (stretched between 23° 35'-26'N and 78- 82' E) has been carried out. An extensive survey was carried out (2006-2010) to know their population status and fluctuation in population, including breeding colonies in Bundelkhand region. The numbers of birds were recorded per year in different seasons, with the help of binoculars. Method was supported by photography. The most common species recorded during the study period was Milvus migrans govinda (resident species) while the rarer species were Haliaeetus leucoryphus, Ichthyophaga ichthyaetus. Aquila helica, Ictinaetus malayensis, Aquila chrysaetos as migratory species in Panna National Park. It was found that number of eagles also variable. It has been recorded that maximum number 1070 in 2010. Highest numbers of chicks were reported in 2009. Juveniles have more tendency of migration.

L40 Animal structure

080. Verma, Deepanjali; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Uppal, Varinder; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Bansal, Neelam; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Histogenesis of circumvallate papillae of buffalo during prenatal life. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1022-1024 KEYWORDS: WATER BUFFALOES. FOETUS. TONGUE. ANIMAL MORPHOLOGY.
The present study was conducted on the tongues of 36 buffalo foetii with CVR length from 1.2 cm to 99.5 cm (age ranging from 34 – 298 days) divided into group 1: foetii between 0–20 cm CVR, group 2: foetii between 20–40 cm

CVR and group 3: foetii above 40 cm CVR. The tissues were fixed in neutral buffered formalin and processed. The paraffin sections of 5–6 µm were cut and stained with hematoxylin and eosin and Masson’s trichrome. In the present study, first indication of formation of circumvallate papillae was observed at 10.7 cm CVR length (77 days) lined by dark layered basal cells and 2–3 layers of superficial cells. In group 2, at 21.4 cm CVR length (122 days) the two stacks of papillae invaginated deep into the tongue mesenchyme to form serous acini. The connective tissue core at the same age was highly vascularized and large number of nerve fibers could be observed penetrating into the core. The primitive taste bud appeared on the apical surface of circumvallate papillae at 45.0 cm CVR length (175 days). The taste pore became apparent at 80.0 cm CVR length (254 days).

081. Kumar, P.; CCS Haryana Agricultural University, Hisar (India). Kumar, Pawan; CCS Haryana Agricultural University, Hisar (India). Histology, histochemistry and scanning electron microscopy of the pineal gland of the pig. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1025-1028 KEYWORDS: SWINE. PINEAL BODY. ENDOCRINE GLANDS. MICROSCOPY. HISTOCYTOLOGICAL ANALYSIS.

The present study was conducted on 10 adult pigs to reveal structure of pineal gland by light and scanning electron microscopy. The pineal gland was surrounded by a layer of dense capsule consisting of reticular and collagen fibres. At places connective tissue trabeculae from the capsule penetrated the parenchyma dividing it into lobes and lobules. The parenchyma of the gland was constituted mainly by pinealocytes whereas, 4 types of glial cells categorized on the basis of nuclear morphology, were present mainly towards the glial zones. The light and dark pinealocytes were arranged in small clusters, irregular groups, rosettes, cords and follicular patterns. At places, melanin containing cells were interspersed in between pinealocytes and glial cells. Corpora arenacea was observed only at few places throughout the pineal parenchyma. The mast cells were absent. The carbohydrates in the form of mucopolysaccharides were uniformly distributed in the cytoplasm of pinealocytes and glial cells whereas, a moderate reaction was observed in processes of pinealocytes and glial cells. The proteins in very less concentration were observed towards capsule of gland however, a moderate reaction was seen in blood capillaries containing blood cells. The lipids distribution in the gland was almost negligible. The scanning electron microscopy of dorsal surface of pineal gland presented fibrous strands oriented in

different directions forming an irregular meshwork. However, cut surface of the gland depicted pinealocytes, glial cells, glial fibres and cellular debris. The surface of round to oval shaped pinealocytes was studded with microvilli like structure whereas round to oval, glial cells presented smooth surface and possessed large sized processes which frequently intermixed with those of other glial cells.

082. Khatun, A.; S.K. University of Agricultural Sciences and Technology, Srinagar (India). Division of Animal Reproduction, Gynaecology and Obstetrics. Wani, G. M.; S.K. University of Agricultural Sciences and Technology, Srinagar (India). Division of Animal Reproduction, Gynaecology and Obstetrics. Choudhury, A.R.; S.K. University of Agricultural Sciences and Technology, Srinagar (India). Division of Animal Reproduction, Gynaecology and Obstetrics. Khan, M.Z.; S.K. University of Agricultural Sciences and Technology, Srinagar (India). Division of Animal Reproduction, Gynaecology and Obstetrics. Islam, R.; S.K. University of Agricultural Sciences and Technology, Srinagar (India). Division of Animal Reproduction, Gynaecology and Obstetrics. Determination of age of prenatals and histomorphological changes of cervix of sheep during different stages of pregnancy. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 56-59 KEYWORDS: SHEEP. ANIMAL MORPHOLOGY. PREGNANCY. PERINATAL PERIOD.

Female genitalia (86) of healthy adult ewes (both pregnant and non-pregnant, 1- 4 years of age) were collected from the local slaughter houses in and around Srinagar city. The gravid uteri of sheep ranging from 14 to 140 days of gestation were divided into five groups viz., G-1 (14–57 days), G-2 (58–74 days), G-3 (75–93 days), G-4 (94–120 days) and G-5 (121–140 days). A new graph was constructed incorporating embryonic lengths for determining practical age of embryos and foetuses from 12 days up to termination of pregnancy. Epithelial lining of the cervix of non-pregnant and early pregnant sheep was simple low columnar with goblet cells which was non-ciliated containing shorter mucosal folds and the lamina propria-submucosa possessed numerous smaller glands. As the gestation period advanced, increased height and loosening of the lamina epithelial mucosa occurred with longer mucosal folds. The glands became larger gradually and their proliferation also occurred with increasing gestational age. Vascular proliferation occurred from lamina propria up to the tunica serosa with increase in gestation periods.

083. Sarma, Kamal; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Anatomy and Histology. Kalita, S.N.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Anatomy and Histology. Devi, J.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Anatomy and Histology. Postnatal histological development of the corpus epididymis in Assam goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 60-63 KEYWORDS: GOATS. ANIMAL MORPHOLOGY. TESTES. PERINATAL PERIOD. ASSAM.

A study was conducted on the corpus epididymis of 18 male Assam goats divided into six groups on the basis of age viz. I (0 day), II (2 months), III (4 months), IV (6 months), V (8 months) and VI (10 months) consisting of three animals in each group. The corpus epididymides were covered by a thick capsule composed principally of collagen fibres. Circularly arranged smooth muscle cells formed 3 to 4 layers peripheral to the basement membrane of each tubule in all the male goats except in day-old kids (G-I). The epididymal tubules were unorganized interrupted epithelium in day-old kids (G-I), distinct tubules being established from 2 month of age (G-II). Well-developed pseudo-stratified tubular epithelium was noticed from 4 month of age (G-III) onwards with principal, basal and apical cells. Sperm cells were observed in the lumina of the epididymides from 6 month of age (G-IV).

084. Indu, V.R.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy. Lucy, K.M.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy. Harshan, K.R.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy. Chungath, J.J.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy. Thankachen, K.C.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy. Histomorphology of the pulmonary acinus in sambar deer (Cervus unicolor). Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 127-131 KEYWORDS: CERVIDAE. ANIMAL MORPHOLOGY. LUNGS. KERALA.

Histomorphological studies were conducted on the pulmonary acinus of a female adult Sambar deer collected from the Zoo, Trichur. The lung acinus which formed the functional unit of the gas exchange area consisted of all the air spaces distal to one terminal bronchiole and comprised

respiratory bronchioles, alveolar ducts, alveolar sacs and alveoli. The respiratory bronchioles were distinctly wide and longer and showed the distended alveoli on their walls. The lining epithelium of the respiratory bronchioles was simple cuboidal except in the areas where they formed the alveoli. The smooth muscle reduced progressively during the transition from terminal bronchiole to respiratory bronchiole. More number of alveoli were recorded per field when compared to the lung tissue of domestic animals. Alveoli were composed of two types of cells, namely type-I pneumocytes and type-II pneumocytes with a few dust cells. The average alveolar diameter was found to be 40.44 ± 2.39 mm.

085. Opinder Singh; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Roy, K.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Sethi, R.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Histogenesis of rumen of buffalo. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 30-33 KEYWORDS: WATER BUFFALOES. PERINATAL PERIOD. ANIMAL MORPHOLOGY. RUMEN.
The present study was conducted on the prenatal rumen of buffalo foetii with curved crown rump length (CVRL) ranging from 5.0 cm to 62.0 cm (51 to 213 days) to observe histomorphological changes during prenatal development. The lamina epithelialis was stratified, cuboidal and divisible into dark basal and light superficial zones at 5.5 cm CVRL (53 days). The nuclei of the basal zone were centric in location and eccentric in superficial zone. The ruminal papillae appeared at 19.6 cm CVRL (120 days) whereas keratohyaline granules were observed in epithelium at 38.5 cm CVRL (160 days). There was gradual increase in height of ruminal epithelium with increase in curved-crown rump length. The surface layer of epithelium became flattened and showed signs of keratinization and desquamation at 55–60 cm CVRL (198 to 211 days). The collagen and reticular fibers were well differentiated at 11.2 cm CVRL (79 days). The tunica muscularis was comprised of inner circular and outer longitudinal smooth muscle cells although reverse orientation of muscle fibers was also observed. In conclusion, rumen undergoes gradual adaptations during prenatal life prior to the intense changes that will occur at the moment of birth.

086. Pawan Kumar; CCS Haryana Agricultural University, Hisar (India). Kumar, P.; CCS Haryana Agricultural University, Hisar (India). Light and scanning electron microscopic studies on the tongue of adult pig. 1. Gustatory papillae. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 34-39 KEYWORDS: SWINE. ANIMAL MORPHOLOGY. TONGUE.
The vallate, foliate and fungiform papillae were collected from adult pigs (9), of local mixed breed immediately after their slaughter. All these papillae were lined by stratified-squamous-epithelium with varying number of cell layers. Large number of taste buds was observed in the foliate and vallate papillae especially, towards the basal portion of the medial wall of the trench. However, only a few taste buds were observed in the fungiform papillae present on the dorsolateral surface of the tongue. The lamina propria submucosa of these papillae had loose irregular connective tissue with predominance of collagen fibres. The deeper portion of the lamina propria submucosa had bundles of nerve fibres, large clusters of serous (von Ebner’s) and mucous glandular acini being separated by the fasciculi of striated skeletal muscles oriented in different directions. The serous glands showed predominance of neutral whereas the mucous acini presented mainly the acidic mucopolysaccharides. Electron microscopy revealed a large central papilla with pseudopapillae but without an annular pad in the vallate papilla. The foliate papillae presented parallel folds of lingual mucosa separated by gustatory furrows which were pronounced in the cut surface. Fungiform papillae were oval to round with flat surface having shallow transversely oriented grooves. Higher magnification of the surface of all the types of papillae revealed flat squamous cells with microridges having pitted appearance and the taste pores.

087. Kapoor, Smita; National Bureau of Fish Genetic Resources, Lucknow (India). Kamalendra; National Bureau of Fish Genetic Resources, Lucknow (India). Bhatt, J.P.; National Bureau of Fish Genetic Resources, Lucknow (India). Lakra, W.S.; National Bureau of Fish Genetic Resources, Lucknow (India). Rathore, G.; National Bureau of Fish Genetic Resources, Lucknow (India). Goswami, M.; National Bureau of Fish Genetic Resources, Lucknow (India). Swaminathan, T. Raja; National Bureau of Fish Genetic Resources, Lucknow (India). Development of primary culture from heart tissue of Chitala chitala (Hamilton-Buchanan). Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 95-97 KEYWORDS: CHITALA CHITALA. CELL CULTURE. HEART.

A method for developing cell cultures from Chitala chitala heart tissue is described. The tissues were minced and seeded in culture flasks and grown in Leibovitz L-15 medium supplemented with 20% foetal bovine serum. The radiation started after 4th day in heart. The medium was changed after every five days. The radiations were able to withstand a wide range of temperatures from 25 °C to 28°C with an optimum temperature of 28°C. A partial monolayer was observed after 12 days in heart tissue. A primary culture was successfully obtained from heart tissue of C. chitala for the first time in India.

088. Pawan Kumar; CCS Haryana Agricultural University, Hisar (India). Kumar, P.; CCS Haryana Agricultural University, Hisar (India). Histology, histochemistry and scanning electron microscopic studies on the tubal tonsil of sheep. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 61-63 KEYWORDS: SHEEP. ANIMAL MORPHOLOGY. TONSILS. MICROSCOPY.

The present light and scanning electron microscopic study conducted on tubal tonsils of young sheep revealed a pseudostratified columnar-ciliated epithelium with goblet cells which irregularly modified at places into follicle associated epithelium. The 2 epithelia differed significantly of which the latter was characterized by absence of goblet and ciliated cells, reduced number of cell layers along with their height and a close association with infiltrated lymphocytes. Scanning electron microscopy delineated 2 types of microvillus cells, transitional and the characteristic M-cells in the follicle associated epithelium on the basis of distribution of microvilli. The lamina propria submucosa had large amount of lymphoid tissue along with few lymphoid follicles which were constituted by different sized lymphocytes, plasma cells, macrophages and high endothelial venules. The goblet cells were strongly PAS positive for neutral whereas the glandular acini had a predominance of acidic mucopolysaccharides.

089. Uppal, Varinder; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Bansal, Neelam; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Pathak, Devendra; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Lingual papillae of the buffalo fetus: an electron microscopic study. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 67-69 KEYWORDS: WATER BUFFALOES. FOETUS. TONGUE. MICROSCOPY.

An electron microscopic study was conducted on the lingual papillae of the buffalo fetus during late gestation. The age of the buffalo foetii ranged between 254–88 days. The study revealed that all papillae were differentiated by this age. The filiform papillae had round tips instead of pointed one. The conical and lenticular papillae were also differentiated. The fungiform papillae were round and covered by desquamated epithelial cells. The circumvallate papillae were surrounded by a papillary groove with taste pores present on the lateral surface of the papillae. The study demonstrated a caudocranial (from root to apex of the tongue) development of the lingual papillae with caudal papillae better developed than cranial one at a time.

L50 Animal physiology and biochemistry

090. Rose, M.K.; C C S Haryana Agricultural University, Hisar (India). Phogat, J.B.; C C S Haryana Agricultural University, Hisar (India). Growth hormone and regulation of reproduction and immune system. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1099-1112 KEYWORDS: PITUITARY HORMONES. LYMPHOCYTES. IMMUNITY.

The primary control of reproduction is through gonadotropins and sex-steroid hormones. The emerging evidences suggest a vital role of growth hormone (GH) and immune system in the control of pituitary and gonadal functions. There is involvement of GH in all the reproductive processes. The immune system through autocrine and/or paracrine mechanisms regualte the interaction of GH in different reproductive proceses. The role of GH, its interaction with immune system and cytokines in the control of reproductive processes has been reviewed.

091. Mohan, N.H.; Indian Veterinary Research Institute, Izatnagar (India). Das, B.C.; Indian Veterinary Research Institute, Izatnagar (India). Bag, S.; Indian Veterinary Research Institute, Izatnagar (India). Sharma, G.T.; Indian Veterinary Research Institute, Izatnagar (India). Relative expression of an H19 like gene in stomach and intestine of mouse. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1141-1142 KEYWORDS: MICE. GENE EXPRESSION. INTESTINES.

In the present study expression of a H19 like gene in the stomach, small and large intestine was studied. Higher transcript concentration of this gene was observed in large intestinal regions over other regions of GIT. The present study could not, however, establish the identity of transcript as H19

itself since nucleotide sequencing was not done. Since the expression of H19 gene with development of tumors and stem cell is known, further studies are required to establish the expression of the gene presently studied and the higher incidence rate of large intestinal tumors in comparison to stomach and small intestine.

092. Singh, R.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Mishra, S.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Swain, R.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Dehuri, P.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Sahoo, G.; Orissa University of Agriculture and Technology, Bhubaneshwar (India).. Mineral profile of feeds, fodders and biochemical profile of animals in west- central table land zone of Odisha. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1148-1153 KEYWORDS: DAIRY CATTLE. FEEDS. FORAGE. MINERAL CONTENT.

Sample of feeds and fodders and serum samples of cows in 8 villages, 2 from each block and 2 blocks from each of the 2 districts namely Bargarh and Jharsuguda of West-central table land zone (WCTLZ) of Odisha were collected and analysed for macro and micro mineral content. Among the fodders, paddy straw was deficient in calcium (Ca), phosphorus (P), copper (Cu) and manganese (Mn). Deficiency of P was observed in most of the fodders. Most of the concentrate contained higher level of the analysed minerals. The average serum Ca, P, zinc (Zn), Cu, Mn and iron (Fe) content of cows in WCTLZ were found to be 6.81±0.14 mg/dl, 3.67±0.09 mg/dl, 0.90±0.02 pmm, 0.68±0.01 pmm, 0.26±0.004 pmm and 2.38±0.07 pmm, respectively. The percentage of animals deficient in serum Ca, P, Zn, Cu and Mn were observed to be 75.8, 72.5, 13.3, 29.1, 9.1 and 5.8 %, respectively. The serum mineral content of the animals of WCTLZ was highly deficient in Ca and P. Deficiency of Zn, Cu, Mn and Fe was also noticed in some animals. The serum glucose, cholesterol, protein, albumin and globulin content of the animals in WCTLZ were 45.87±1.56 mg/dl, 63.99±2.84 mg/dl, 4.49±0.09g/dl, 2.16±0.05g/dl and 2.32±0.08g/dl, respectively. Based on the study, supplementation of deficient minerals, viz. Ca, P, Zn and Cu and protein and energy in the diet of cattle under existing feeding practices in WCTLZ of Odisha is imperative for better health and productivity.

093. Deshpande, K.Y.; Indian Veterinary Research Institute, Izatnagar (India). Mehra, U.R.; Indian Veterinary Research Institute, Izatnagar (India). Singh, P.; Indian Veterinary Research Institute, Izatnagar (India). Verma, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Purine derivatives concentration in body fluids as influenced by different energy levels in dairy cows. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1244-1247 KEYWORDS: DAIRY COWS. PURINES. BLOOD COMPOSITION. BODY FLUIDS.

Purine derivative (PD) concentration in different body fluids (plasma, milk and urine) was studied in 30 dairy cows (Bos taurus × Bos indicus; 331 to 369 kg mean body weight and 9.8 to 10.1 kg/d average milk yield) fed on the diets having mixed green fodders and concentrate mixtures (CM-1, CM-2, CM-3) containing varying amount of maize and wheat bran in group 1 (control), group 2 and group 3, respectively, following completely randomized design. The concentration of allantoin and total PD (mmol/L) in urine was comparable between groups 1 and 2, but was significantly higher in group 3. Moreover, the concentration of allantoin, uric acid and PD (mmol/l) in milk and plasma was significantly different among 3 groups (1, 2 and 3) indicating that the small variations in TDN and ME intake through diets (1, 2 and 3) could be reflected significantly in allantoin and PD concentration in plasma and consequently in milk but not in urine samples. The correlation coefficient (r) between digestible dry matter intake (DDMI, kg/d) and milk allantoin (mmol/L) was 0.67. The correlation of total PD (mmol/l) in milk was better than that of plasma and urine. The diurnal variation in PD secretion in milk (mmol/d) could be explained to a great extent by DDMI (kg/d) (R^2 = 0.65 and 0.75 in morning and evening milk respectively). It is concluded that the assay of allantoin and total PD in milk samples can be effectively used to assess the microbial protein supply in dairy cows on account of small variation in energy levels in diets.

094. Ojha, B.K.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Singh, P.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Verma, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Chaturvedi, V.B.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Kumar Ajit; Indian Veterinary Research Institute, Izatnagar (India). Centre

for Advanced Faculty Training in animal Nutrition. Effect of Feeding of Deoiled Mahua Seed Cake and Guar Meal on Blood Biochemicals, Immune Response and Urinary Purine Derivatives in Crossbred Calves. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 69-78 KEYWORDS: CALVES. OILSEED CAKES. FEEDING. IMMUNE RESPONSE. BLOOD COMPOSITION.

An experiment was conducted to study the performance of male crossbred calves (average age 4.5 month; average weight 67.6 kg) were divided into three equal groups (T1,T2 and T3) following completely randomized design and fed concentrate mixture containing groundnut cake (T1), while in T2 and T3, deoiled mahua seed cake (DMSC) and guar meal (GM) was included 0% in the concentrate mixtures, respectively. The intake and digestibility of nutrients was similar among three treatments. However, ADG and FCR was significantly (P0.05) improved in T2 than that of T1 but it was comparable to T3. At the end of 120 days experimental feeding, the values of blood biochemical profile observed were within the normal physiological range in crossbred calves and did not differ significantly (P0.05) among different dietary treatments. Similarly, excretion of urinary purine derivatives (allantoin, uric acid & creatinine) and humoral immune response were comparable among three groups irrespective of DMSC or GM supplementation. The results indicated that inclusion of deoiled mahua seed cake or guar meal at 10% level in the concentrate mixture of growing crossbred calves showed significant improvement in ADG and FCR but comparable digestibility of nutrients, blood biochemical profile and immune response.

095. Deen, Aminu; National Research Centre on Camel, Bikaner (India). Serum Creatinine, Urea Nitrogen And Endogenous Creatinine Clearance Based Glomerular Filtration Rate In Camels To Evaluate Renal Functions. Camel: An International Journal of Veterinary Sciences (India). (Jan 2013) v. 1(1) p. 1-12 KEYWORDS: CAMELS. CREATININE. GLOMERULONEPHRITIS. KIDNEYS.

To evaluate renal functions in camel, the study on profiles like Serum Creatinine (SC), Serum urea nitrogen (SUN), SUN/SC ratio was undertaken in institute’s herd of camels (n=250) (Camelus dromedarius) of all age groups, both sexes and three breeds and in addition Glomerular Filtration rate (GFR) of 18 male camels of 3 breeds (n=6 each) with 6 individual replicates (Total 108 observations) were determined. The values of SC and SUN/SC ratio differ significantly (P 0.05) between breeds, while those of SUN did

not differ (P0.05). SC was significantly higher in male (P0.05), while SUN and SUN/SC ratio was significantly higher (P0.05) in females. The values of SC and SUN/SC ratio did not differed significantly (P0.05) in different age groups, while SUN differed significantly (P0.05) between different age groups. Daily Urine Output (UO) and GFR differed significantly (P0.05) between Bikaneri and Kachchi breeds, while the difference was statistically non-significant (P0.05) between Bikaneri and Jaisalmeri and Bikaneri and Kachchi breeds. UO and GFR had highly significant (P0.01) positive correlation ship(r

096. Sharma, A.K.; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, Department of Veterinary Physiology. Kataria, N.; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, Department of Veterinary Physiology. Influence of season on some serum metabolites of Marwari goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 52-55 KEYWORDS: GOATS. BLOOD COMPOSITION. METABOLITES. SEASONS.

The present investigation was carried out to assess the effect of extreme hot climate on serum metabolites in 300 Marwari goats of either sexes aged just after birth to three years belonging to farmer's stock. Serum metabolites were determined during moderate and extreme hot climatic conditions taking 150 animals in each group. The overall mean values of serum glucose, total lipids, triglycerides, cholesterol, creatinine and bilirubin were 40.18±0.77, 122.92±4.10, 91.60±1.72, 117.99±1.81, 0.73±0.02 and 0.10±0.003 mg/dl, respectively. Mean values of serum glucose, total lipids, and triglycerides were significantly (P0.05) lower and that of cholesterol, creatinine and bilirubin were significantly (P0.05) higher during extreme climatic condition than moderate one. Concentration of serum cholesterol was significantly (P0.05) lower in animals of above one year of age compared to below one year in moderate climatic conditions. In extreme climatic conditions, serum holesterol and bilirubin were significantly (P0.05) lower in animals of above one year of age group than below one year of age. Thus, significant decrement was observed in serum glucose, total lipids and triglycerides while cholesterol, creatinine and bilirubin showed increment in response to extreme hot climatic condition.

097. Yadav, C.M.; Maharana Pratap University of Agriculture and Technology, Bhilwara (India). Krishi Vigyan Kendra. Tailor, S.P.; Maharana Pratap University of Agriculture and Technology, Bhilwara (India). Krishi Vigyan Kendra. Study on morphological traits and physiological parameters of Sonadi sheep in its native tract. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 141-142 KEYWORDS: SHEEP. LAND RACES. BODY TEMPERATURE. RESPIRATION RATE.

Data on morphological traits (ear, leg and tail length) and physiological parameters (rectal temperature and respiration rate) were recorded every month on 3681 Sonadi sheep maintained by 115 shepherds of 8 tehsils of 4 districts of native breeding tract in southern Rajasthan. The ear, leg and tail lengths were 11.84, 26.86 and 17.26 cm at birth which reached to 18.80, 42.31 and 31.72 cm at 18 months of age. The differences with respect to districts were found significant for ear, leg and tail length at all the stages of life. The effect of sex on all the morphological traits was to be found non-significant. The overall least squares means for body temperature and respiration rate were 38.54 ± 0.39°C and 28.13±0.74/min at birth, 38.40±0.09°C and 26.69 ± 0.26/min at 3 months, 37.95±0.12°C and 25.97±0.33/min at 6 month of age. The variations due to district and sex were non-significant on both the physiological parameters at all the ages in young stock.

098. N Mishra, N. Tandon, V.L.; Banasthali University, Banasthali (India). Department of Bioscience and Biotechnology. N Mishra, N. Tandon, V.L.; Banasthali University, Banasthali (India). Department of Bioscience and Biotechnology. Haematological effects of aqueous extract of Ornamental plants in male Swiss albino mice. Veterinary World (India). (Jan 2012) v.5(1) p. 19-23 KEYWORDS: LABORATORY ANIMALS. MICE. ORNAMENTAL PLANTS. PLANT EXTRACTS. BLOOD COMPOSITION.

Treatment of mice with crude extract of Hibiscus rosa sinensis flowers (500 mg/kg BW) and Bougainvillea spectabilis leaves (800 mg/kg BW) for a period of 30 days indicates a significant increase in the level of hemoglobin and count of RBC but a significant decline in the level of MCH and MCV in the former case. On the other hand, in B. spectabilis treated animals, the level of hemoglobin, RBC count & PCV declined significantly. Hence, it is concluded that the use of H. rosa sinensis whereas may not cause any adverse effect on animals, B. spectabilis is to be used with care as its chronic use may cause anemia. PCV.

099. Borah, S.; Assam Agricultural University, Khanapara, Guwahati (India). College of Veterinarey Science, Department of Veterinary Physiology. Sarmah, B.C.; Assam Agricultural University, Khanapara, Guwahati (India). College of Veterinarey Science, Department of Veterinary Physiology. Chakravarty, P.; NRC on Yak, Dirang (India). Dutta, D.J.; Assam Agricultural University, Khanapara, Guwahati (India). College of Veterinarey Science, Department of Veterinary Physiology. Sarmah, B.K.; Assam Agricultural University, Khanapara, Guwahati (India). College of Veterinarey Science, Department of Veterinary Physiology. Mohan, N.H.; NRC on Pig. Rani (India). Kalita, D.3; Assam Agricultural University, Khanapara (India). AICRP on Pigs. Effect of zinc supplementation on serum levels of certain enzymes in pigs. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 202-204 KEYWORDS: SWINE. ZINC. SUPPLEMENTS. BLOOD COMPOSITION. ENZYMES.

An experiment was conducted to study the effect of zinc supplementation on the activities of certain serum enzymes-alkaline phosphatase (ALP), CuZn superoxide dismutase (CuZnSOD), ceruloplasmin, SGOT and SGPT in pigs. Twenty four crossbred (Hampshire X Assam Local) pigs, 4 months of age were randomly divided into 3 groups (n=8 in each). Control (C) animals were offered basal diet supplemented with AAUVETMIN (Strategic Mineral Mixer) containing 100ppm elemental zinc (NRC requirement). Treatment 1 (T1) pigs were given Calcium Carbonate .5% on DM basis to induce zinc deficiency in addition to the diet offered to control group. Pigs of Treatment 2 (T2) group were offered the same basal diet but supplemented with AAUVETMIN containing 500ppm elemental zinc. The serum ALP and CuZnSOD activity decreased significantly (P0.01) in T1 group from day 15 (18.49 ± 0.51KAU/100 ml and 29.67 ± 0.68U/mgHb) of treatment but increased significantly (P0.01) in T2 group from day 15 (20.39 ± 0.58 51KAU/100ml and 32.32 ± 1.09 U/mgHb) till day 120 (28.91 ± 0.27 KAU/100ml and 53.32 ± 0.95 U/mgHb) respectively. Serum levels of ceruloplasmin ranged between 85.15±1.86/ig/100ml and 87.11 ± 1.35 µg/100ml but did not differ significantly. SGOT and SGPT concentration increased significantly (P0.01) in T2 group from day 30 (47.14 ± 1.09 U/L and 43.02 ± 1.50U/L) and day 45 (50.59 ± 1.27 U/L and 44.33 ± 1.62 U/L) respectively. The SGPT concentration in T1 group decreased significantly (P0.01) from day 75 (41.35 ± 0.29 U/L) onwards but no alteration was observed in T1 group.

0100. Anand, L.N.; National Dairy Research Institute, Karnal (India). Sehgal, J.P.; National Dairy Research Institute, Karnal (India). Prasad, Shiv; National Dairy Research Institute, Karnal (India). Namagiri lakshmi, S.; National Dairy Research Institute, Karnal (India). Damoder, Shashikant; National Dairy Research Institute, Karnal (India). Plasma IGF-I and lactoferrin as biomarkers of post-weaning stress and the effect of feeding probiotic to low body weight calves for the improvement of growth performance in crossbred KF calves. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 70-73 KEYWORDS: CALVES. INSULIN-LIKE GROWTH FACTOR. POSTWEANING PERIOD. STRESS. GROWTH RATE.

Management practices as well as environmental and pathological stresses have an impact on growth performances and health status of calves. Lactoferrin is a glycoprotein and is a prominent component of host-defense against infection. Insulin like growth factor I (IGF-I) has been established as a biochemical indicator for different production traits. The present study was under taken to evaluate the role of IGF-I and lactoferrin as biomarkers for growth performances and health status in female crossbred KF calves and the effect of probiotic (Saccharomyces cerevisiae) supplementation on growth performance in post-weaned calves. Plasma concentration of these factors were correlated with growth performances in terms of body weight gain, dry matter intake, feed conversion efficiency, metabolic body weight gain in post-weaned calves. Calves exhibiting normal body weight (HBW) and the ones exhibiting lesser body weight (LBW) with respect to age (P0.01) were divided into 2 groups. The body weight of LBW group was significantly less (P0.001) during the pre-supplementation period (122 days). At 60d post-supplementation period, the significant difference between the body weight decreased (P0.01). The circulatory level of IGF-I was significantly high (P0.01) in HBW group when compared with LBW. During the post-supplementation period, the concentration of lactoferrin was not significantly different in both the groups and had decreased to the basal level (500–420 vs.150–250ng/ml) in comparison to pre-supplementation period, suggesting normal immune status and reduced stress/ inflammation. Supplementation of probiotic improved growth performance to a lesser extent in LBW group. IGF-I can act as a marker for growth performance in crossbred calves.

0101. Aditya Kumar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Singh, Ishwar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Mrigesh, Meena; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Transmission electron microscopic studies on granulocytes and platelets of sheep. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 64-66 KEYWORDS: SHEEP. PLATELETS. MICROSCOPY. LYMPHOCYTES. MONOCYTES.
Transmission electron microscopic (TEM) study was conducted on blood cells of ten normal healthy sheep (Ovis aries). The lymphocytes under TEM were almost round in outline with comparatively long cytoplasmic processes and could be classified as small, medium and large, depending upon their size. The monocytes under TEM showed large number of variable sized cytoplasmic processes characterized by large number of pinocytic vesicles and vacuoles having variable amount of lysed material. The platelets were elongated, oval or circular in outline depending upon the plane of section. The granules were generally round in shape with variations in size and interior detail.

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0102. Nirmalan T.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Mondal, B.C.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Tiwari, D.P.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Anil Kumar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Effect of dietary supplementation of organic and inorganic copper on growth and nutrient utilization in crossbred female calves. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1044-1048 KEYWORDS: CALVES. SUPPLEMENTS. COPPER. GROWTH RATE. NUTRITION PHYSIOLOGY.
Crossbred female calves (15), aged 12 to 15 months with average body weight of 134 kg, were randomly divided into 3 uniform groups of 5 each. All the calves were fed ad lib. green oats and measured quantity of concentrate mixture. The calves in group 2 were supplemented with 25 mg organic copper/calf/day as copper propionate and in group 3 were supplemented with 50 mg inorganic copper/calf/day as copper sulphate whereas calves in group 1 kept as control. The feeding trial lasted for 90 days, including six days digestion trial. The daily average DMI during entire feeding trial was 5.60±0.05, 5.68±0.14 and 5.73±0.04 kg in groups 1, 2

and 3, respectively and there was no significant difference in DMI among different groups. The digestibility of DM, OM, EE, NFE and NDF were significantly higher in group 3 than in group 1, and comparable with group 2. However digestibility of CF and ADF was significantly higher in group 3 than groups 1 and 2. The CP digestibility differed significantly among different groups. Total weight gain and FCR were significantly improved in groups 2 and 3 supplemented with copper as compared to control. From the present studies, it may be concluded that copper supplementation as copper sulphate or copper propionate in the ration of crossbred calves had better performance in terms of growth, nutrient utilization and feed efficiency under existing feeding.

0103. Reddy, K. Kondal; Sri Venkateswara Veterinary University, Hyderabad (India). Reddy, P.V.M.; Sri Venkateswara Veterinary University, Hyderabad (India). Harikrishna, Ch.; Sri Venkateswara Veterinary University, Hyderabad (India). Lakshmi, D. Naga; Sri Venkateswara Veterinary University, Hyderabad (India). Raghunandan, T.; Sri Venkateswara Veterinary University, Hyderabad (India). Effect of dietary supplementation of certain enzymes on growth performance and feed conversion efficiency in Yorkshire piglets. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1259-1261 KEYWORDS: PIGLETS. GROWTH RATE. FEED CONVERSION EFFICIENCY.

Large White Yorkshire piglets (18) were used to evaluate the effect of supplementing a cock tail of enzymes (cellulase, xylanase, protease, lipase, phytase, pectinase, hemicellulase, amylase, ß-mannanase and ß-glucanase) in pig diets on growth performance, feed conversion efficiency and economics. Piglets were fed basal diets and assigned randomly to one of 3 dietary treatments. Treatment diets were positive control diet with low fibre-4.48%; high energy-ME, 2800 Kcal/kg (PC; n, 6), negative control diet with high fibre6.7%; low energy-ME, 2500 Kcal/kg (NC; n, 6) and negative control diet supplemented with enzymes (ENC; n, 6). Dry matter (DM) intake, was tended to be lower for the NC and ENC groups compared to PC group. The final weight, total gain and ADG were significantly higher on ENC group compared to NC group, while PC group was intermediate. The feed conversion ratio and cost of gain was significantly lower in ENC and PC groups compared to NC group of piglets. Cost of feeding was lower in piglets fed ENC diet (12.1%) followed by PC diet (10.3%) compared to NC diet, whereas cost of feeding recorded for ENC diet was 1.7% lower than PC diet. Therefore, the enzyme cost is marginal relative to the

benefits achieved and is justified for inclusion in swine diets and any attempt to reduce the feed cost by the utilization of feed grade enzymes in diets would improve the profitability.

0104. Rath, S.C.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Pillai, B.R.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Mohanty, S.N.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Sarkar, S.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Growth and survival of Macrobrachium rosenbergii (de Man) post larvae fed with iso-proteic diets incorporated with fishmeal and its substitution exclusively by plant protein. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1272-1275 KEYWORDS: MACROBRACHIUM ROSENBERGII. FISH MEAL. PLANT PROTEIN. SUPPLEMENTARY FEEDING.
M. rosenbergii post-larvae were reared for 45 days in ponds using net hapa (2.5 m × 1.0 m × 1.0 m) of 0.8 mesh/ mm 2 and fed with 3 iso-proteic (35%) and iso-lipid (6%) feeds. Feed A and B contained 15 and 7.5% fish meal, which was totally replaced by soybean meal in feed C. At the end of the rearing period, there was a significant difference in weight of prawn larvae among different diets fed groups with a maximum in feed C (0.64±0.02 g) followed by feed B (0.62±0.72 g) and feed A (0.44±01 g). Survival (%) of prawn larvae in different feed groups did not differ significantly. SGR (% day -1) differed significantly among the experimental groups and the highest was recorded in feed C (1.35±0.30) followed by feed B (1.28±0.07) and feed A (0.99±0.01). Apparent FCR of feed C was significantly lower than feed B and feed A. The PER of feed C (1.1±0.04) and feed B (1.06±0.02) was significantly higher than feed A (0.74±0.01). Similarly, the NPU was significantly higher in feed C groups followed by feed B and feed C groups. The cost of feed C was lowest (INR 13.91) than feed B (INR 15.07) and C (INR 16.24).The results of this experiment revealed that fish meal could be completely replaced by soybean meal in the feeds for nursery rearing of M. rosenbergii without hampering the growth, dietary performances and survival of prawn larvae.

0105. Kumar Latesh; Bihar Veterinary College, Patna (India). Department of Animal Nutrition. Singh P.K.; Bihar Veterinary College, Patna (India). Department of Animal Nutrition. Chandramoni; Bihar Veterinary College, Patna (India). Department of Animal Nutrition. Kumar Manoj; Bihar Veterinary College, Patna (India). Department of Animal Nutrition. Effect of Dietary Supplementation of Combination

of Probiotics on the Growth Performance and Immune Response of Broiler Chickens. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 15-25 KEYWORDS: BROILER CHICKENS. SUPPLEMENTARY FEEDING. PROBIOTICS. GROWTH RATE.

A study was conducted to evaluate the effects of different probiotics i.e Lactiflora (Lactobacillus acidophilus), Provisacc (Saccharomyces cerevisiae) on the growth performance, nutrient retention and immune responses of broiler chickens. Two hundred forty day-old broiler chicks (Vencobb) were randomly allotted to one of four treatments on the basis of body weight in a randomized complete block design. Each treatment had 60 chicks arranged in 3 replicates of 20 chicks each and reared for a period of 42 days. Dietary treatments were basal diet without any probiotics (control, T1 basal diet only), T2 (T1 + Lactiflora 0.05%), T3 (T1 + Provisacc 0.05%) and T4 (T1 + Lactoiflora 0.05% + Provisacc 0.05%). Chicks were vaccinated with New Castle Disease Virus (NDV) and Infectious Bursal Disease Virus (IBDV) and antibody titer was determined to assess the humoral immune response. Blood parameters analysis and a metabolism trial of three days duration was conducted during 6th week of growing periods. Dietary supplementation of probiotics significantly (P0.05) enhanced growth performance by improving body weight gain, performance index and protein efficiency ratio. Growth performance and nutrient retention of Lactiflora supplemented group (T2) was significantly (P0.05) better then control (T1) and Provisacc supplemented group (T3) but comparable to combination group (T4). Broiler chickens fed diet supplemented with probiotics showed a significant decrease (P0.05) in cholesterol concentration compared to control group. Supplementation of Lactobacillus acidophilus and Saccharomyces cerevisiae either alone or in combination improved the antibody titres to NDV and IBDV as compared to untreated control group for all period of observation. It was concluded that combined supplementation of Lactobacillus acidophilus and Saccharomyces cerevisiae supplementation at the rate of 0.05% each is beneficial in improving growth performance, nutrient utilization and immune response of broiler chicken.

0106. Nayak, Sunil; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Animal Nutrition. Baghel, R.P.S.; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Animal Nutrition. Nayak, Anju; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Animal Nutrition.

Studies on the Utilization of Rock Phosphate without and with Aluminium as Alternate to Dicalcium Phosphate in Egg Type Starter Chicken. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 35-44 KEYWORDS: LAYER CHICKENS. ROCK PHOSPHATE. NUTRITION PHYSIOLOGY.

In order to reduce the cost of mineral mixture in egg type starters, present study was planned to assess the utilization of rock phosphate (RP) without and with aluminium sulphate as an alternate to dicalcium phosphate (DCP) in their mineral mixture. Four hundred and five day-old White Leghorn chicks were randomly distributed to nine dietary treatments, each with three replicates of 15 chicks. Diet T1 served as control; in diets T2, T4, T6 and T8 DCP of the control ration was replaced with RP at 40, 60, 80 and 100% levels, respectively, whereas, diets T3, T5, T7 and T9 were the same as T2, T4, T6 and T8 except for the addition of aluminium (as sulphate) at a ratio of 0.8 Al: 1.0 F. The experiment was conducted for 0–8 weeks. The overall performance of the chicks indicated that increase in RP instead of DCP reduced the weight gain of chicks which became significant (P0.05) when RP was used above 40% level. Use of higher levels of RP caused significant reduction in feed intake, feed efficiency ratio and performance index. Similarly, DM utilization and nutrient retentions (CP, EE, CF, NFE, Ca and P) were also maximum and significantly (P0.05) higher in the birds fed the T2 (40% RP) diet. However, serum ALP, ALT and AST activities were normal in birds receiving up to 60% RP (T4) beyond which the values showed increases. Similarly, serum levels of Ca, P, Cu, Fe, Mn and Zn were also not affected except at higher levels of RP wherein the values showed reducing trends. Serum F concentration was found to be directly related to the levels of RP used. Use of RP along with aluminium sulphate instead of DCP did not influence their weight gain, feed intake, FER and PI up to 60% level along with other measured parameters. The cost per kg weight gain increased due to use of higher levels of aluminium sulphate. Hence, it is concluded that RP could be used to replace DCP at 40% when used alone, and at 60% level when used along with aluminium sulphate in the mineral mixture of egg type starters. However, supplementation of aluminium sulphate to RP may not be an economical proposition.

0107. Mohanty, S.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Fish Health Management Division. Mishra, P.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Fish Health Management Division. Dash, S.S.; Central Institute of Freshwater Aquaculture,

Bhubaneswar (India). Fish Health Management Division. Samanta, M.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Fish Health Management Division. Meher, P.K.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Fish Health Management Division. Cellulolytic Activity in the Digestive Tract of Grass Carp Ctenopharyngodon idella. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 45-56 KEYWORDS: CTENOPHARYNGODON IDELLA. CELLULOLYSIS. DIGESTIVE SYSTEM.

The present research was carried out to assess the cellulolytic activity in fish GI tract. Existing protocols for terrestrial animals were modified and standardized for the estimation of different active components of cellulase enzyme complex (endoglucanase, exoglucanase, and â-glucosidase) in Ctenopharyngodon idella (grass carp). The standardized protocols were applied to quantitate cellulase enzyme activity in different portions of intestine (anterior, middle and posterior), hepatopancreas and intestinal contents. In more than 60% of the samples maximum enzyme activity was found in the anterior intestine, followed by middle intestine and the lowest activity was detected in the posterior portion. Cellulase activity was found in 48 isolated bacteria from the grass carp intestine and intestinal content samples. The enzyme activity pattern from both the endogenous and exogenous source in the study, suggested that the cellulose digestion in grass carp might be carried out in an interesting way where the endoglucanase produced by the fish, first breaks down the complex structure, generating oligosaccharides of various lengths and consequently new chain ends which are later acted upon by the â-glucosidase produced from both bacterial and fish source and exoglucanase produced only from bacterial source.

0108. Singh, Sultan; Indian Grassland and Fodder Research Institute, Jhansi (India). Plant Animal Relationship Division. Singh, B.B.; Indian Grassland and Fodder Research Institute, Jhansi (India). Plant Animal Relationship Division. Effect of Supplementation of Tree Leaves on Rumen Microbial Population, Enzyme Activity and Water Kinetics in Goats fed Cenchrus ciliaris Grass Hay. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 131-138 KEYWORDS: GOATS. FEEDING. CENCHRUS CILIARIS. RUMEN MICROORGANISMS. SUPPLEMENTARY FEEDING. ENZYME ACTIVITY.

Present study evaluates the supplementary effect of tree leaves on rumen microbes, enzyme activities and liquid

digesta kinetics in goats fed Cenchrus ciliaris (CC) grass based diets. Four adult male goats were fed CC-Leucaena leucocephala (CC-LL) and CC-Grewia optiva (CC-GO) diets in 2 separate feeding trials. Goats were offered grass (CC) and respective tree leaves in 50:50 for 90d on each diet. Rumen liquor samples were drawn at 0 and 4 h post-feeding at 60 and 90 days post-feeding to enumerate the rumen microbes and enzymes, while water kinetics were estimated at 90 days. The proteolytic bacteria were higher (P0.05) on CC-GO than CC-LL diet, while the other groups of bacteria, protozoa and fungi were comparable on both diets. The population of entodiniomorphs and holotrichs contributed 77.8 and 22.2% of the total protozoa on CC-LL and CC-GO diet, respectively. Occurrence (%) of isotricha and entodinium was highest, while occurrence of polyplastron and ophryoscolex genera was the least in rumen liquor of goats on both diets. Mean cellulase activity of enzyme in rumen liquor was higher (P0.05) on CC-LL than CC-GO diet. Rumen outflow rate was significantly (P0.05) higher in goats on CC-LL than CC-GO diet. Results revealed that goats fed CC-LL diet had higher cellulase enzyme activity and rumen outflow rate than CC-GO diet.

0109. Jakhmola, R.C.; Central Sheep and Wool Research Institute, Bikaner (India). Central Sheep and Wool Research Institute, Bikaner Raghuvansi, S.K.S.; Central Sheep and Wool Research Institute, Bikaner (India). Pahuja, Taruna; Central Sheep and Wool Research Institute, Bikaner (India). Central Sheep and Wool Research Institute, Bikaner. Gas production and fermentation of Lasiurus sindicus based composite diet with Acacia jacquemontii leaves. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 69-74 KEYWORDS: ACACIA. LEAVES. RUMEN DIGESTION. PROTOZOA. SHEEP.
The study was conducted to evaluate the effect of incorporating leaves of Bawali in Sewan (Lasiurus sindicus) based composite feed on in vitro gas production (24h), degradability of dry matter, organic matter and NDF, concentration of rumen metabolites and protozoa count. Acacia jacquemontii Benth (Bawali) is an important tree of Thar Desert of India, leaves contained 16.3% crude protein (CP), 46.1% neutral detergent fibre (NDF) and 28.2% acid detergent fibre (ADF). The leaves contained 16.0 g/kg DM condensed tannins and 81.9 g/kg DM total phenols. L. sindicus based composite feed (CFM) consisted of roughage to concentrate ratio of 75:25, containing 10.3% C P. The leaves of Acacia jacquemontii were added either at 5 or at 10% level in the CFM. The gas production (GP) in CFM was 104 ml/g DM and inclusion of A. jacquemontii leaves at 5 or

10% level increased GP significantly (P0.01). Similar effect of A. jacquemontii leaves incorporation was observed on organic matter degradability and metabolisable energy contents. The incorporation of A. jacquemontii leaves in CFM adversely affected the ammonia-N, total-N and microbial biomass production. The A. jacquemontii leaves incorporation increased the small chain fatty acid concentration but decreased the protozoa population. The study suggested that A. jacquemontii leaves modulate the rumen fermentation and further study need to be conducted.

0110. Muralidharan, J.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Jayachandran, S.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Selvaraj, P.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Vish, P.; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Saravanakuma, V. Ramesh; Veterinary College and Research Institute, Namakkal (India). Department of Livestock Production and Management. Effect of concentrate and urea molasses mineral block supplementation on blood biochemical profile of Mecheri lambs. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 75-79 KEYWORDS: LAMBS. MOLASSES. SUPPLEMENTS. CONCENTRATES. BLOOD COMPOSITION.
Forty Mecheri male lambs (3–4 months old) were divided into 5 groups of 8 each and reared under T1 -Grazing alone, T2-Grazing + concentrate supplementation, T3 - Grazing + (urea molasses mineral block) UMMB supplementation, T4-Intensive rearing + concentrate supplementation and T5 - Intensive rearing + UMMB supplementation for a period of 150 days. Blood samples were collected at 30, 60, 90, 120 and 150 days of experiment. Serum protein increased in T2 and T3 groups whereas, serum albumin remained similar in all the groups. Serum calcium values were higher (P 0.05) in all the groups compared to the control and among them, UMMB supplementation group (T3) had highest values. Concentrate supplemented group (T2) had significantly (P0.05) higher serum phosphorus. Grazing and concentrate supplementation group (T2) had higher (P0.05) serum cholesterol than grazing alone group (T1) and stall-fed groups (T4 and T5). UMMB supplemented group (T5) had significantly (P 0.01) higher blood urea nitrogen values compared to other groups. It was concluded that blood biochemical parameters were influenced by supplementation

of concentrate and UMMB.

0111. Mudgal, Vishal; College of Veterinary Science and Animal Husbandry, Mhow (India). Department of Animal Nutrition and Feed Technology. Mehta, Mukesh Kumar; College of Veterinary Science and Animal Husbandry, Mhow (India). Department of Animal Nutrition and Feed Technology. Rane, Ashok Sopan; College of Veterinary Science and Animal Husbandry, Mhow (India). Department of Animal Nutrition and Feed Technology. Effect of feeding lentil (Lens culinaris) Straw-based rations on nutrient utilization, rumen fermentation, growth and economics in Barbari kids. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 80-84 KEYWORDS: KIDS. LENS CULINARIS. GRAIN CROPS. NUTRITION PHYSIOLOGY. RUMEN DIGESTION.
Lentil (Lens culinaris) straw (LS, untreated as well as urea ammoniated, ALS) was evaluated in total mixed ration (TMR) of growing (6–8 months) Barbari male kids. Ten kids were divided randomly into two equal groups, one group was fed LS based TMR (LSTMR), while other group received ALS based TMR (ALSTMR). Feeding of ALSTMR had negative (P0.05) effect on crude protein (CP) digestibility, while digestibility of fibre fractions i.e. neutral detergent fibre (NDF) and acid detergent fibre (ADF) improved significantly (P0.01). Similarly, intake of dry matter (DM, P0.05), energy (TDN) and digestible crude protein (DCP) improved (P0.01) upon ALSTMR feeding. The DCP value of ALSTMR diet was high (P0.01), while TDN remained unchanged. Feeding of ALSTMR also improved the nitrogen balance (P0.05) as well as growth performance (P0.01) of the kids. Rumen fluid of ALSTMR fed kids had higher (P0.05) total and ammonical nitrogen contents. Cost of production reduced by Rs. 10 per kg live weight gain. Thus it may be concluded that use of urea treated lentil straw in total mixed ration of kids improved protein value, fibre utilization, nitrogen balance and all together improved growth and reduced cost of production.

0112. Srinivas, Kumar D.; Sri Venkateswara Veterinary University, Gannavaram (India). NTH College of Veterinary Science, Department of Animal Nutrition. Prasad, R.M.V.; Sri Venkateswara Veterinary University, Gannavaram (India). NTH College of Veterinary Science, Department of Animal Nutrition. Kishore, K. Raja; Sri Venkateswara Veterinary University, Gannavaram (India). NTH College of Veterinary Science, Department of Animal Nutrition. Rao, E. Raghava; Sri Venkateswara Veterinary University, Gannavaram (India). NTH College of Veterinary Science, Department of Animal

Nutrition. Effect of Azolla (Azolla pinnata) based concentrate mixture on nutrient utilization in buffalo bulls. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 268-271 KEYWORDS: BULLS. AZOLLA PINNATA. CONCENTRATES. NUTRITION PHYSIOLOGY.

A metabolism trial was conducted after 30 days of feeding using twelve graded Murrah buffalo bulls (301.96 ± 6.98) to study the effect of incorporation of sun dried Azolla (Azolla pinnata) meal in the concentrate mixture on intake, digestibility of nutrients and on retention of nitrogen, calcium and phosphorus. The DMI (kg/100 kg BW) was similar between the 2 groups. The average digestibility coefficients of DM, OM, CP, EE, CF, NFE, NDF, ADF, cellulose and hemicellulose decreased (P0.05) with incorporation of sun dried Azolla meal in the concentrate mixture of buffalo bulls as compared with the control. All the buffalo bulls were in positive N, Ca and P balances. The % DCP (P0.05) and TON (P0.05) content decreased with incorporation of sun dried Azolla (Azolla pinnata) meal in the concentrate mixture compared with the control. It can be concluded that sun dried Azolla meal could replaced about 25 per cent of the total protein in the concentrate mixture of graded Murrah buffalo bulls for maintenance without any adverse effects.

0113. Kore, K.B.; Indian Veterinary Research Institute, Izatnagar (India). Pattanaik, A.K.; Indian Council for Agricultural Research, New Delhi (India). Das, A.; Indian Veterinary Research Institute, Izatnagar (India). Sharma, K.; Indian Veterinary Research Institute, Izatnagar (India). Evaluation of mannanoligosaccharide as prebiotic functional food for dogs: effect on nutrient digestibility, hind gut health and plasma metabolic profile. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 81-86 KEYWORDS: DOGS. HEALTH FOODS. DIGESTIBILITY. METABOLISM.

The present study was designed, using 5 adult dogs in complete crossover design, to assess the effect of dietary supplementation of mannanoligosaccharide (MOS) on nutrient digestibility, hind gut health indices and plasma metabolic profile. Accordingly, the dogs were fed on a homemade diet alone or that supplemented with MOS (at 1% level). A digestion trial, conducted at the end of each period, revealed that the intake of feed DM and other nutrients increased (P0.05) when supplemented with MOS. Digestibility of fibre was improved (P0.05) in MOS supplemented group, while that of other nutrients were not affected. The concentration of lactate and short-chain fatty acids (SCFA) in faeces, viz. propionate and butyrate showed increasing trend

which resulted in higher faecal concentration of total SCFAs due to MOS supplementation. Addition of MOS tended to reduce faecal coliforms with an associated elevation (P0.05) in lactobacilli count compared to control. The plasma triglyceride was reduced while that of inorganic phosphorous increased in dogs supplemented with MOS. Overall, supplementation of MOS 1% of diet DM positively influenced feed intake, fiber digestibility and indices of hindgut health with subtle influence on certain blood biochemical parameters.

0114. Jakhmola, R.C.; Central Sheep and Wool Research Institute, Bikaner (India). Arid Region Campus. Pahuja, Taruna; Central Sheep and Wool Research Institute, Bikaner (India). Arid Region Campus. Singh, N.; Central Sheep and Wool Research Institute, Bikaner (India). Arid Region Campus. Raghuvansi, S.K.S.; Central Sheep and Wool Research Institute, Bikaner (India). Arid Region Campus. Effect of Including the Leaves of Calligonum polygonides or Acacia tortilis as a component in Grass Based Complete Diet on Gas Production and Rumen Fermentation. Indian Journal of Animal Nutrition (India). (Mar 2012) v. 29(1) p. 15-23 KEYWORDS: RUMINANTS. IN VITRO EXPERIMENTATION. COMPLETE FEEDS. ACACIA TORTILIS. ACACIA. RUMEN DIGESTION. IN VITRO EXPERIMENTATION.
Plant species as modulating agents are being aggressively investigated to increase efficiency of rumen fermentation. Calligonum polygoides and Acacia tortilis are important desert plant species, which can serve as top feeds for ruminant feeding. An experiment was conducted to evaluate mature Lasiurus sindicus based complete feed (Roughage: concentrate ratio; 75:25) with different levels (0, 5, 10%) of C. polygonoides or A. tortilis leaves using gas production technique. Leaves of C. polygonoides and A. tortilis contained 59 and 25 g/kg condensed tannins (CT) and 228 and 70 g/kg total phenols, respectively. Inclusion of both kinds of leaves did not exert any influence on gas production. However, the gas production constant (‘c’) was 0.090 in complete feed and it increased significantly (P0.05) with both the supplements when included in complete feed. The contents of CT (r.

0115. Lakshmi, M Santhi; Sri Venkateswara Veterinary University, Tirupati (India). Chandrasekhara Rao, T.S.; Sri Venkateswara Veterinary University, Tirupati (India). Rajalakshmi, K.; Sri Venkateswara Veterinary University, Tirupati (India). Prenatal development of membranous viscerocranium in buffalo. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 28-29 KEYWORDS: WATER BUFFALOES. PERINATAL PERIOD. EMBRYONIC DEVELOPMENT.

The present work was undertaken on Buffalo embryos (509) and fetuses starting from 26 days to 310 days to study the development of different bones forming the membranous viscerocranium. The ossification of skull was first appeared in mandible, maxilla and malar at 45 days. Early ossification of lacrimal, squamous temporal and tympanic ring was evident at 49 days. The ossification of palatine was first observed at 53 days while premaxilla and vomer showed ossification at 56 days. Early ossification of nasal bone was observed at 61 days. The vomer was in contact with the floor of the nasal cavity throughout separating two posterior nares completely.

0116. Panigrahi, Manjit; Indian Veterinary Research Institute, Izatnagar (India). Subodh Kumar.; Indian Veterinary Research Institute, Izatnagar (India). Deb, , S.M; Central Arid Zone Research Institute, Pali (india). Regional Station. Mitra, Abhijit; Indian Veterinary Research Institute, Izatnagar (India). Sharma, Arjava; Project Directorate on Cattle, Meerut Cantt (India). Bujarbaruah, K.M.; Assam Agricultural University, Guwahati (India). Characterization of insulin like growth factor-1 (IGF-1) partial gene in mithun. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 89-91 KEYWORDS: INSULIN-LIKE GROWTH FACTOR. BOVINAE. POLYMORPHISM.

A 396 bp fragment of insulin like growth factor-1 (IGF-1) gene, which included complete exon 5, was amplified in mithun (Bos frontalis). The PCR–RFLP analysis showed the absence of polymorphism in this fragment with respect to MspI restriction enzyme and showed 1 restriction site, which produced 2 fragments of 273 and 123 bp. Only 2 single nucleotide differences existed in mithun sequences when compared to that of cattle. The genomic sequence homology between mithun and cattle was 99.5%, whereas the deduced amino acid sequences showed 100% homology. The sequence of the wild allele, which was the first report on exon 5 of mithun IGF-1, was submitted to GenBank (Accession number EF686016).

0117. Mathur, A.K.; Project directorate on Cattle, Merrut (India). Prasad, R.; Project directorate on Cattle, Merrut (India). Sharma, S.; Project directorate on Cattle, Merrut (India). Efficacy of oral feeding of combined preparation of progesterone and oestrogen on the induction of oestrus in Frieswal females. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1113-1115 KEYWORDS: HEIFERS. OESTROUS CYCLE. PROGESTERONE.

Delayed puberty and prolonged anoestrus are the most frustrating problems in crossbred cattle. To overcome this problem in Frieswal females 3 trials were conducted. In the first trial 7 heifers having mean age 23.6±2.4 months were fed a combination of progesterone and oestrogen (1.2 mg levonorgestrel + 0.24 mg ethinylestradiol) along with a mineral mixture 40g/day/head for 10 days. In the second trial same treatment was repeated in 10 heifers (mean age 28.2±2.32 months). In the third trial 20 Frieswal fermales having mean age 56.59±5.50 months were fed combined preparation of progesterone and oestrogen (1.2 mg norgestrel + 0.24 ethinylestradiol) per day along with 50g of mineral mixture chillated/head/day for 10 days, whereas 6 heifers were kept as control. Oestrus was observed daily twice in the morning and evening throughout the experimental period with the help of a teaser bull. It was observed that trial in 1, 2 and 3; 71.4, 70.0 and 80% females exhibited oestrus within 45 days. However, in control group only 33% heifers exhibited estrus after 11.5±4.5 days. The estimation of copper and zinc indicated that concentration of these minerals were sub normal in all the treatment groups before the start of the experiment. These studies indicated that feeding of combined preparation of progesterone and estrogen can be used as the most economical and convenient method to overcome the problem of anoestrus in Frieswal females.

0118. Kharche, S.D.; Central Institute for Research on Goats, Makhdoom (India). Goel, A.K.; Central Institute for Research on Goats, Makhdoom (India). Jindal, S.K.; Central Institute for Research on Goats, Makhdoom (India). Goel, Puja; Central Institute for Research on Goats, Makhdoom (India). Jha Bipul Kumar; Central Institute for Research on Goats, Makhdoom (India). Birth of twin kids following transfer of in-vitro produced goat embryos. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1132-1134 KEYWORDS:

GOATS. EMBRYO TRANSFER. PARTURITION. MULTIPLE BIRTHS.

Oocytes (1127) were collected from 531 goat ovaries of abattoir origin. Collected oocytes were matured in TCM199 medium containing 5µg/ml FSH, 10µg/ml LH, 10% FBS and 3 mg/ml BSA at 38.5°C in CO incubator under humidified air. After 27 h of in-vitro maturation oocytes were denuded by hyaluronidase enzyme and by passing repeatedly through fine pipette. After 48h post insemination, oocytes were observed for cleavage. Cleavage rate, 2 cell, 4 cell, 8– 16 cell, morulae and blastocysts were 44%, 17%, 25%, 33.11%, 16% and 2%, respectively. In-vitro produced embryos of 2 - 4 cell stage were surgically transferred into the fallopian tube ipsilateral to the ovary containing corpus luteum of two naturally synchronized surrogate does (8 embryos each). Similarly, 8–16 cell and morula stage embryos were transferred surgically at the tip of uterine horn ipsilateral to the ovary containing corpus luteum of 6 naturally synchronized surrogate does (8 embryos each). Following transfer, 2 recipients were initially found pregnant at day 35 th post transfer by ultrasonography. Subsequently on re-examination at day 60, only 1 recipient was confirmed pregnant and delivered twin offspring of male and female sex after 142 days of gestation.

0119. Malik, A.A.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Gandotra, V.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Brar, P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Ghuman, S.P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Dhaliwal, G.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Honparkhe, M.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Effect of poly unsaturated fatty acid supplementation on luteal profile and conception in postpartum buffaloes. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1135-1137 KEYWORDS: WATER BUFFALOES. PERINATAL PERIOD. PROSTAGLANDINS. POLYUNSATURATED FATTY ACIDS. REPRODUCTIVE PERFORMANCE.

Pluriparous postpartum buffaloes (10) belonging to organized dairy farm were supplemented with 250 g FM/ buffalo/day for 90 days postpartum and 5 buffaloes were kept as non-supplemented control. On day 60 postpartum, all the buffaloes were synchronized using Ovsynch protocol followed by fixed TAI at 16 and 40 h after second GnRH injection.

Subsequent to Ovsynch protocol, all the buffaloes were subjected to ovarian ultrasonography on day 0 (day of estrus and AI) and day 12 post AI and blood sampling on days 0, 5, 12 and 40 post-insemination. There was no difference in the preovulatory follicle size and CL size in both the groups and plasma progesterone concentration in control and non-pregnant FM supplemented buffaloes. Of supplemented 10 animals, 5 conceived as compared to none in control group. It was concluded that FM supplementation had no influence on preovulatory follicle size, CL size and plasma progesterone concentration. However, FM induced suppression in PGFM concentration might have resulted in better conception in the supplemented buffaloes.

0120. Singh, A.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Prabhakar, S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Brar, P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Uppal, S.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Prahlad Singh; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Gandotra, V.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Acid-base status and blood gas tensions of neonatal buffalo calves under normal and forced calving. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1215-1218 KEYWORDS: CALVES. BLOOD GASES. NEWBORN ANIMALS. PARTURITION.

The evaluation of acid-base homeostasis in difficult parturition is vital to clinical recognition of metabolic disorders to provide correct therapeutic measures. The acidbase status and blood gas tensions of buffalo calves delivered normally (n, 17) and delivered through manipulations and forced traction (n, 17) were studied over a period of 5 h immediately after calving. Changes in the acid-base status and blood gas dynamics were suggestive of metabolic acidosis with some compensation immediately after delivery in normally delivered (ND) calves. The calves delivered through forced extraction (FD) had distinct metabolic acidosis which continued up to 4 h after calving. Decreased oxygen utilization following dystocia was evident which improved over the period of time after calving. Furthermore, wider differences were recorded in the acid-base and blood gas values of metabolic acidosis of arterial and venous capillary blood. These differences found in the levels of acidbase balance between both kinds of blood revealed restricted informative significance in the venous

blood.

0121. Histomorphological study of uterus of adult non-descript goat (Capra hircus) during various stages of folliculogenesis. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1222-1224 KEYWORDS: GOATS. UTERUS. REPRODUCTION. INFERTILITY.

The uterus of goat at 3 stages of folliculogenesis were investigated for their histomorphological organization. The wall of uterus was consisted of endometrium, myometrium and perimetrium. The endometrium was lined by pseudostratified columnar epithelium. It was folded, the height of epithelium and folds increased in all the 3 region of the uterus (horn, body and cervix) from group A to C. Enodometrial branching of the folds was maximum in cervix region of the uterus. The glands were distributed in superficial and deep zones and their density was maximum in deeper zone. Caruncular area of the endometrium was devoid of gland.

0122. Banerjee, Priyanka; National Bureau of Animal Genetic Resources, Karnal (India). Joshi, Jyoti; National Bureau of Animal Genetic Resources, Karnal (India). Upasna, S; National Bureau of Animal Genetic Resources, Karnal (India). Tantia, M.S.; National Bureau of Animal Genetic Resources, Karnal (India). Vijh, R.K.; National Bureau of Animal Genetic Resources, Karnal (India). Sequence and phylogenetic analysis of Toll like receptor genes TLR-3 and TLR-9 in buffaloes. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1225-1230 KEYWORDS: WATER BUFFALOES. NUCLEOTIDE SEQUENCE. IMMUNE RESPONSE.

Toll like receptors (TLRs) play an important role in the innate immune recognition. Ten members of the TLR family have been identified in bovine and 2 of these recognize PAMPs specific to viruses (TLR3 and TLR9). The main objective of this work was to sequence the 2 genes in Bubalus bubalis, detection of SNPs in these 2 genes in different buffalo breeds, prepare gene tree and compare amino acid sequences with other species for construction of phylogenetic tree. The primers for the 2 genes were designed from the cattle genome database. The genomic DNA samples from 24 animals drawn from 6 diverse breeds of Indian water buffalo (Bhadawari, Kerela, Murrah, Pandharpuri, Surti and Tarai) were utilized. The amplified genomic DNA yielded fragments of expected sizes. The alignment of sequences with Bos taurus as reference sequence, permitted the comparative analysis of buffalo TLR3 and TLR9 gene and the presumed

protein sequence with respect to cattle. TLR3 consisted of 5 exons in which 6 SNPs were detected, out of which 4 were non-synonymous whereas, TLR9 comprised of 2 exons and 7 SNPs were identified, out of which 1 was non-synonymous. These SNPs in the exonic regions were novel and has potential for their use in diversity analysis as well as association studies with tolerance to bacterial and viral infections in buffaloes. The phylogenetic analysis revealed even-toed animals joining first followed by other mammals which later joined by poultry species. The last to join the tree were bony fishes (Sarcopterygii). Surprisingly, TLR9 showed similarity with TLR7 in all the species studied for which information is available in the database. This has been reflected in the phylogenetic tree.

0123. Sofi, K.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Khan, M.Z.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Akhoon, Z.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Lone, F.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Wani, A.R.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. In vitro maturation of oocytes in sheep. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 16-25 KEYWORDS: SHEEP. IN VITRO FERTILIZATION. OVA.

In vitro maturation of oocytes is a valuable tool to capture vast supply of oocytes from abattoir material for in vitro production of embryos and other assisted reproductive technologies. In the initial efforts in sheep, mature oocytes were collected after ovulation or from pre-ovulated follicles. But, with the development of in vitro maturation as a successful tool, immature oocytes were first collected from intact ovaries and matured in vitro. This was followed by collection of oocytes from ovaries of abattoir material which is the cheapest and most abundant source of immature oocytes for various assisted reproductive technologies. Although developmental competence of in vitro matured oocytes is not at par to that of in vivo matured oocytes, but the continuous study in this aspect through the use of various cultural conditions supplemented with different hormones, growth factors and antioxidants have greatly enhanced the

developmental potential of these in vitro matured oocytes, thereby, encouraged its use for large scale generation of embryos. Thus the efficient system is required to support the normal maturational process of ruminant oocytes in vitro, a pre-requisite for increasing the number of developmentally competent embryos from animals of agricultural importance. It will be equally important to enlarge the population of transgenic or endangered animals and to form female germplasm banks through cryopreservation of mature oocytes as a tool of conservation. Keeping in view the importance, the overview briefly describes various aspects of in vitro maturation.

0124. Godara, Aditya; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, College of Veterinary and Animal Science. Gahlot, G.C.; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, College of Veterinary and Animal Science. Ashraf, Mohammad; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, College of Veterinary and Animal Science. Ghorui, S.K.; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Science, College of Veterinary and Animal Science. Polymorphism of growth hormone BMP-15 gene in Marwari goat. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 32-36 KEYWORDS: GOATS. POLYMORPHISM. PCR. RFLP.
A study was undertaken to investigate polymorphism in BMP-15 (Fec XBand Fec XG in exon-2) gene in Marwari goats by RFLP technique. Samples were collected from 60 unrelated goats of Marwari breed from different locations in Bikaner district. Genomic DNA was extracted by phenol:chloroform method and amplified using exon-2 Fec XB and Fec XG specific primers. The amplification was obtained at between 153 bp and 141 bp. The purified amplicons were digested with five base cutter restriction enzymes: DdeI and HinfI (5GANTCA & 3CTNAGT). All samples showed the absence of polymorphism at the Fec XB and Fec XG loci of BMP-15 gene. Hence, BMP-15 gene cannot be regarded as the major gene associated with the fecundity of goats. Further investigation may be directed at other loci of BMP-15 gene or other genes, using larger sample size.

0125. Jain, Asit; National Dairy Research Institute, Karnal (India). Animal Genomics LabJain, Tripti; National Dairy Research Institute, Karnal (India). Animal Genomics Lab. Sachdeva, G.K.; National Dairy Research Institute, Karnal (India). Animal Genomics Lab. De, S,; National Dairy Research Institute, Karnal (India). Animal Genomics Lab. Goswami, S.L. .; National Dairy Research Institute, Karnal (India). Animal Genomics Lab. Datta, T.K.. Effect of FSH on expression of cathepsin K and S during in vitro muturation of buffalo oocytes andtheir subsequent development competence. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p.137-142 KEYWORDS: WATER BUFFALOES. OVA. FSH. IN VITRO.
Follicle stimulating hormone (FSH) has been identified as a modulator of oocyte function and antiapoptotic molecule. It has been observed that FSH decreased follicular atresia by decreasing the aspartic lysosomal enzyme (cathepsin D) in rodent. In present study, it was determined whether FSH treatment of oocytes during maturation affects expression of cathepsin K and S (cysteine cathepsins) genes, DNA fragmentation during maturation and associated developmental capacity of oocytes. COCs were collected from abattoir derived ovaries and in vitromatured in TCM-199 based serum-free medium containing 0 (control) and 10 µg/ml FSH at 38.5°C for 24 hours. After maturation transcript level of cathepsin K and S genes was determined by optimized real time PCR assay in cumulus cells. In vitrofertilization (IVF) and in vitroculture (IVC) of fertilized embryos were carried out in mSOF medium. Terminal deoxynucleotidyl transferase-mediated dUTP nick-end labeling (TUNEL) assay was carried out to count apoptotic cells. It was found that FSH may involve in attenuating cumulus cells apoptosis by decreasing the cathepsin K and S expression, which probably helps in better in-vitrooocytes maturation, in vitrofertilization and further embryonic development.

0126. Narayan, Sowmya; Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Swamy, M. Narayana; Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Isloor, Srikrishna; Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Veena, T.; Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Jayakumar, K.; Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Swamy, H.D. Narayana. Veterinary College, Bangalore (India). Department of Veterinary, Physiology. Estradiol-17P levels in the ovarian follicular fluid of ankamali pigs. Indian Journal of

Animal Research (India). (Jun 2012) v. 46(2) p. 184-186 KEYWORDS: SWINE. OVARIAN FOLLICLES. OESTROGENS.
A study was carried out to determine the estradiol-17â levels in the follicular fluid in relation to the size of ovarian antral follicles in Ankamali pigs. The ovaries were collected from apparently healthy, non pregnant and cyclic Ankamali pigs in the age group of 2 to 5 years which were brought for slaughtering at civil meat processing and production centre, Frazer town, Bangalore during the months of February to May, 2010. The surface antral follicles on the ovaries were classified into three groups on the basis of their diameter, viz., Group I (small, 3 mm), Group II (medium, 3–6.9 mm) and Group III (large, 7–12 mm). Follicular fluid was aspirated and pooled separately from these three groups of follicles, centrifuged and the supernatant was stored at −20°C until used for estimation of estradiol-17â levels by enzyme linked immunosorbent assay. The results of the present study revealed that the estradiol-17â levels were significantly (P0.05) higher in the large follicles (13.87 ± 0.32 ng/ml) compared to small follicles (11.13 ± 0.61 ng/ml). But, the estradiol-17â levels in the medium follicles (12.83 ± 0.43 ng/ml) differed non-significantly when compared with small and large follicles. It was concluded that the levels of estradiol-17â in the ovarian follicular fluid of Ankamali pig increases with the size of follicles.

0127. Lalrintiuanga, K.; Central Agricultural University, Aizawl (India). College of Veterinary Sciences and Animal Husbandry. Lallianchhunga, M.C.; Central Agricultural University, Aizawl (India). College of Veterinary Sciences and Animal Husbandry, Deptt. of Physiology and Biochemistry. Pelvimetry in local breed of cows in Mizoram.. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 199-201 KEYWORDS: COWS. LAND RACES. MIZORAM. PARTURITION.
Twenty five local breed of cows in Mizoram was used for the study of external pelvimetry and its influence on parturition. The mean inlet and outlet pelvic area as measured using external pelvimetry was 222.78 ± 0.25 and 140.53 ± +0.05, 246.97 ± 0.04 and 155.39 ± 0.02, 259.79 ± 0.02 and 163.71+ 0.06, and260.12 ± 0.12 and 163.97 ± 0.02 cms2 in 1st calvers, 2nd calvers, 3rd calvers and 4^{th} calvers respectively. The overall area of pelvic inlet and outlet was 247.42 ± 0.13 and 156 ± 0.17 cms2 respectively. The incidence of dystocia was 8% and the case of dystocia in the present study was not due to the pelvic area.

0128. Lalrintluanga, K.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Deka, B.C.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Nath, K.C.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Bhuyan, D.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Hmar, L.; CAU, Aizawl (India). CVSC&AH, Department of LPM. Farrowing behaviour of large white yorkshire sows under organized and indigenous systems in Mizoram. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 239-241 KEYWORDS: SWINE. PARTURITION. MIZORAM.

A total of 56 farrowings comprising 26 and 30 farrowings of Large White Yorkshire (LWY) sows from organized and indigenous systems of rearing respectively were studied for different parameters on farrowing. It was revealed that LWY sows reared in organized and indigenous systems exhibited similar pattern of occurrence of different preparturient behaviours viz., mammary gland enlargement, swelling of vulva, colostrums in teat, reddish vulvar mucosa, pawing at the floor and vaginal discharge. The parturient behaviours viz. paddling of legs, switching of tail, complete lateral recumbency and both ventral and lateral recumbency were also similar in both the systems. However, during the entire period of farrowing, 61.54 and 36.67 per cent of sows under organized and indigenous systems of rearing respectively were lying down continuously whereas 38.46 and 63.33 per cent of sows respectively stood up in between expulsion of piglets.

0129. Machiya, Padmawati; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Physiology. Sarmah, B.K.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Physiology. Chakravarty, P.; CSWRI, Avikanagar (India). Division of Animal Physiology. Biswas, R.K.; Intervet, Holland (Holland). Sarmah, B.C.; Assam Agricultural University, Guwahati (India). College of Veterinary Science, Department of Veterinary Physiology. Deka, B.C.; Intervet, Holland (Holland). Reproductive performances in goat following synchronization of oestrus with progesterone impregnated vaginal sponge and gonadotropin. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 258-262 KEYWORDS: GOATS. OESTRUS SYNCHRONIZATION. PROGESTOGENS. GONADOTROPINS.

Reproductive performances were studied in goat following synchronization of oestrus with progesterone-impregnated

vaginal sponge plus PMSG and HCG. Five Assam goats, 2-3 years of age, at about 45 days post-parturition, reared under semi-intensive were treated with progesterone impregnated vaginal sponges kept in situ for 9 days. On the day of sponge removal PMSG was injected intramuscularly 300 LV. per animal and also injected HCG intravenously at 6 hr post oestrus 500 LV. The A.L was done with Beetal buck semen at 24 and 36 hr post onset of oestrus. Five other Assam goats of similar age, reproductive status and rearing condition served as control. All the experimental goats exhibited oestrus following treatment and the mean interval between end of PMSG treatment and onset of oestrus was 34.40 ± 4.16 hr, where as the control animals exhibited oestrus at a mean interval of 68.80 ± 6.71 days after last kidding. The duration of oestrus was recorded to be longer in treated group (40.00 ± 4.60 hr) than in control goats (36.40 ± 3.12 hr), however, the difference was not significant between the groups. The mean body weight of male and female kids born was 0.90 ± 0.04 and 0.71 ± 0.05 kg and 1.00 ± 0.04 and 0.86 ± 0.24 kg in treated and control group, respectively. A total of 12 and 9 kids were born from 5 does each of treated and control group. The sex ratio was 1:1 and 1.25:1 in treated and control group, respectively. It was concluded that progesterone-impregnated vaginal sponge was effective to induce pronounced synchronized oestrus in Assam goats and to increase the litter size by 33.33 per cent.

0130. Deneke, Yosef; Indian Veterinary Research Institute, Izatnagar (India). Nanda, Trilok; Indian Veterinary Research Institute, Izatnagar (India). Modular Lab Building, Division of Veterinary Biotechnology, Genetic Engineering of Bacteriology. Yadav, Prem Singh; Central Institute for Research on Buffaloes, Hisar (India). Comparative study on the effect of BSA and FCS as a supplement in TCM-199 on the in vitro maturation of buffalo oocytes. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 298-301 KEYWORDS: WATER BUFFALOES. OVA. IN VITRO FERTILIZATION.

Availability of developmentally competent buffalo oocytes is critical for in vitro embryo production and application of related biotecniques. The objective of the present study was to assess the effect of BSA in place of FCS as maturation media supplement on in vitro maturation buffalo oocytes. Oocytes were aspirated from abattoir ovarian follicles of 2-8 mm diameter followed by maturation in TCM-199 supplemented with hCG, PMSG and containing either 0.4% BSA (group-I) or 10% FCS (group-II). Based on cumulus expansion maturation rate was assessed among the two

groups, group II showing a significant higher percentage values (89.1±3.5%) as compared to the group I (73.9±4.2%).

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0131. Khan, M.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Chakraborty, A.K.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Kmandal, T.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Immunomodulatory impact of dicamba in Black Bengal goats following repeated oral administration. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1032-1034 KEYWORDS: GOATS. DICAMBA. IMMUNOSUPPRESSION.

The study was conducted to evaluate immunomodulatory effect of the herbicide, dicamba on goats. Black Bengal (9) male adult goats were divided into 3 groups, each containing 3 animals. Control (group 1) group received carboxy-methyl cellulose, while experimental control (group 2) group received levamisole at immunostimulating dose and experimental group (group 3) was given Dicamba daily for 35 days. On day 36, all goats were immunized with 5% SRBC intraperitoneally and on day 5 post dosing SRBC animals were sacrificed for conducting haemolytic plaque assay. Total serum IgG level was estimated by Sandwitch ELISA. No significant variation in serum IgG level was observed at different days against 0 day in control and experimental group. But serum IgG level was increased significantly in experimental control group. No significant variation was observed in % of plaque formation in control and experimental group but the value was significantly higher in experimental control group. Results indicated that dicamba had no effect on immunomodulation of goats during this observation period.

0132. Saravanan, B.C.; Indian Veterinary research institute, Izatnagar (India). Bansal, G.C.; Indian Veterinary research institute, Izatnagar (India). Manigandan, L.; Indian Veterinary research institute, Izatnagar (India). Sankar, M.; Indian Veterinary research institute, Izatnagar (India). Ravindran, R.; Indian Veterinary research institute, Izatnagar (India). Rao, J.R.; Indian Veterinary research institute, Izatnagar (India). Development of a non-radioactive probe generated by RAPD-PCR for the detection of Theileria annulata. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1089-1092 KEYWORDS: THEILERIA ANNULATA. NUCLEIC PROBES. RAPD. PCR.

A highly reproducible, dominant and monomorphic fragment of 963 base pair (bp) was amplified from the genome of Theileria annulata by random amplified polymorphic DNA - polymerase chain reaction (RAPD-PCR) using a arbitrarily selected primer AP 17 (5’-GGTGACGCAG-3’). This fragment was reamplified using the same random primer (AP), gel purified and labeled with digoxigenin (DIG). Dot-blot hybridization of total genomic DNA with the probe detected Parbhani and Izatnagar strains of T. annulata with a threshold detection level of 10 pg of parasite template DNA. No cross-hybridization was observed with Babesia bigemina, Trypanosoma evansi and the bovine host DNA. The sensitivity of the DIG labeled probe developed in this study is at least 6 to 65 times higher than the other DIG labeled probes developed in India and therefore considered highly suitable for diagnosis of carrier animals especially when they are imported or exported from the country.

0133. Varma, Rachna; Narender Dev University of Agriculture and Technology, Kumarganj, Faizabad (India). Choudhary, G.K.; Narender Dev University of Agriculture and Technology, Kumarganj, Faizabad (India). Choudhary, P.K.; Narender Dev University of Agriculture and Technology, Kumarganj, Faizabad (India). Singh, S.P.; Narender Dev University of Agriculture and Technology, Kumarganj, Faizabad (India). Panwar, H.S,; Narender Dev University of Agriculture and Technology, Kumarganj, Faizabad (India).. Ameliorative efficacy of ashwagandha (Withania somnifera) in pesticides intoxicated cockerel. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1093-1098 KEYWORDS: COCKERELS.

The present study was undertaken to know the ameliorative efficacy of aswagandha in pesticides intoxicated cockerels. Ninety, 8-week old male White Leghorn cockerels were randomly divided into 9 groups of 10 birds each. Group 1 was considered as control and group 2 (endosulfan100 ppm), 3 (chlorpyriphos 250 ppm), 4 (deltamethrin 100 ppm), 5 (fenvalarate 250 ppm), 6 (endosulfan100 ppm + ashwagandha 100 ppm), 7 (chlorpyriphos 250 ppm + ashwagandha 100 ppm), 8 (deltamethrin 100 ppm + ashwagandha 100 ppm), 9 (fenvalarate 250 ppm + ashwagandha 100 ppm) were considered as treated groups. They were fed medicated ration for 24 weeks. Blood samples (4–6 ml) were collected at 12 and 24 week interval from wing vein of cockerels using sterilized disposable syringes in a heparinised test tube and in other test tube without anticoagulant for separating serum for estimation of different

biochemical parameters. There was significant increase in total protein, serum bilirubin, serum urea, serum creatinin, serum cholesterol, serum K, AST, ALT and ALP in pesticides intoxicated cockerel at 12 and 24 weeks interval and simultaneously feeding of aswagandha subsides the levels in comparison to control. Similarly significantly decreases the serum Ca, Na, erythrocyte acetylcholine esterase and plasma acetylcholine esterase in pesticides intoxicated cockerel at 12 and 24 weeks interval and simultaneously feeding of aswagandha subsides the levels in comparison to control.

0134. Sinha, D.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Epidemiology. Singh, D.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Epidemiology. Goswami, T.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Epidemiology. Immunoreactivity of Brucella melitensis 16M Soluble Antigen (BmSA) after Ion-exchange Chromatography. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 65-68 KEYWORDS: BRUCELLA MELITENSIS. ELISA. ION EXCHANGE CHROMATOGRAPHY.

In the present study, soluble antigen of Brucella melitensis 16 M (BmSA) was prepared and purified by ion-exchange chromatography (DEAE-Sepharose) with linear gradient of NaCl (5 mM to 1 M) in TrisHCl buffer (10 mM, pH 7.5). The fractions obtained constituted three distinct peaks, containing varying amount of protein and carbohydrate. The immune reactivity of these fractions in relation to lipopolysaccharide (LPS) – protein association by enzyme-linked immunosorbent assay (ELISA) is described.

0135. Bablu Kumar; Indian Veterinary Research Institute, Izatnagar (India). Chaturvedi, V.K.; Indian Veterinary Research Institute, Izatnagar (India). Somrajan, S.R; Indian Veterinary Research Institute, Izatnagar (India). Kumar, P.; Indian Veterinary Research Institute, Izatnagar (India). Sreedevi, R.; Indian Veterinary Research Institute, Izatnagar (India). Kumar, S.; Indian Veterinary Research Institute, Izatnagar (India). Kaushik, P.; Indian Veterinary Research Institute, Izatnagar (India). Comparative immune response of purified native OmpH protein derived from Pasteurella multocida P52 and oil adjuvant vaccine against hemorrhagic septicemia in mice. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1193-1196 KEYWORDS: CATTLE.

Hemorrhagic septicemia (HS), caused by Pasteurella multocida serotype B:2, is an economically important disease of cattle and buffalo; and causes serious economic losses to

cattle industry in Asian subcontinent. In the present study Native OmpH protein of Pasteurella multocida (serotype B: 2) strain P52 was purified and used for immunization of mice. Humoral and cell mediated immune response were assessed by ELISA and MTT respectively. Protective ability of vaccine was assessed by direct challenge test. The immune response of native OmpH protein was compared with standard oil adjuvant vaccine (OAV). High titers of specific antibody and strong T cell proliferative response were observed in mice, vaccinated with native OmpH protein as well as OAV, as compared to PBS control group. Furthermore, both the vaccines induced balanced Th1 and Th2 response as determined by IgG isotype analysis. Despite strong humoral and cell mediated immune response native OmpH vaccine could only provide partial protection to mice against direct challenge with live P. multocida P 52.

0136. Kumari, R; Birsa Agricultural University, Ranchi (India). Prasad, A.; Birsa Agricultural University, Ranchi (India). Tiwary, B.K.; Birsa Agricultural University, Ranchi (India). Ganguly, S.; Birsa Agricultural University, Ranchi (India). Oroxylum indicum possess a potential effect on humoral and cell mediated immune response in broiler chicks. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1212-1214 KEYWORDS: IMMUNE RESPONSE. CELL MEDIATED IMMUNITY. CHICKS. ANTHELMINTICS.

Levamisole treatment was found to have superior stimulatory effect on both humoral and cell mediated immune response of chicks compared to O. indicum on these parameters. O. indicum root bark powder showed a better response over its stem bark counterpart. Thus, O. indicum root bark powder may be recommended as safe and commercially beneficial immunomodulator as is evident from better humoral immune response against NDV vaccine for better protection against diseases.

0137. Tiwari Shireen; College of Veterinary Sciences and Animal Husbandry, Bikaner (India). College of Veterinary and Animal Science, Department of Veterinary Pharmacology and Toxicology. Sahni, Y.P.; College of Veterinary Sciences and Animal Husbandry, Bikaner (India). College of Veterinary and Animal Science, Department of Veterinary Pharmacology and Toxicology. Anti-stress activity of Withania somnifera (Ashwagandha) on solar radiation induced heat stress in goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 64-68 KEYWORDS: GOATS. HEAT STRESS. WITHANIA SOMNIFERA.

The present study was carried out to evaluate the anti-stress activity of Withania somnifera (Ashwagandha) on solar radiation induced heat stress in healthy male goats. Aqueous extract of W. somnifera root powder (400 mg/kg body weight) was orally administered to goats along with exposure to solar radiation. The anti-stress activity of W. somnifera was investigated by measuring changes in lipid peroxidation, glutathione level and superoxide dismutase activity in erythrocytes of goats. There was a significant increase in the lipid peroxidation level and a significant reduction in the reduced glutathione and superoxide dismutase activity in untreated goats. Oral administration of W. somnifera root powder modulated the lipid peroxidation, reduced glutathione and superoxide dismutase level to near normal in heat stressed goats.

0138. Kerketta, Archana E.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Pal, S.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Rawte, D.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Sanyal, P.K.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Mandal, S.C.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. In vivo Tolerance to triclabendazole by mutant strains of Verticillium chlamydosporium in goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 100-105 KEYWORDS: BENZIMIDAZOLES. GOATS. IN VIVO EXPERIMENTATION.

Local parasitologically naïve female goats of similar body weights divided into 3 groups, were fed on millet grain culture of albendazole mutant (VC-ABZ) and ethyl methane sulphonate mutant (VC-EMS) strains and wild strain (VC-CON) of Verticillium chlamydosporium separately following deworming at 20 g per animal per day for 15 consecutive days. On 5th day of fungus feeding, goats of all the three groups were administered intraruminally with triclabendazole (TCBZ) at 10.0 mg kg−1 body weight. Whole blood was collected in 5 ml heparinized vacutainer tubes at 0, 4, 8, 12, 18, 24, 30, 36, 48, 72, 96, 120, 144 and 168 hrs post dosing with triclabendazole. Simultaneously faecal samples were collected per rectum on the same hour intervals during blood collection and for another two days after completion of blood sampling at 24 h interval. Faecal samples were subjected to coproculture. Data on fungal recovery was superimposed

with the data on plasma drug metabolite concentration so as to deduce the optimum concentration of drug that might exhibit mycostasis. The mean plasma levels of triclabendazole sulphoxide (TCBZ-SO) in goats fed on chlamydospores of all three strains of fungus after administration of triclabendazole revealed increased plasma levels in VC-ABZ fed goats at 12 h (P0.05) and 72–120 h (P0.001). For TCBZ-SO, concentration maximum (Cmax) was significantly more (P0.05) in goats fed on VC-CON compared to VC-ABZ and VC-EMS fed animals. Goats fed on VC-EMS exhibited reduced time to reach Cmax (tmax) and area under concentration-time curve (AUC; P0.05) compared to VC-CON and VC-ABZ fed goats. The experiments indicated that ABZ mutant (VC-ABZ) of V. chlamydosporium was more tolerant to in vivo administration of TCBZ compared to the wild isolate (VC-CON). However, TCBZ exhibited total mycotoxic effect on EMS mutant (VC-EMS) of V. chlamydosporium. These experiments provided evidence that both chemical and ABZ-mutant of egg parasitic fungus, V. chlamydosporium, could be used simultaneously during integrated management of fasciolosis and amphistomosis in livestock.

0139. Sharma, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery. Clinical and Haemato-biochemical changes following surgical management of urolithiasis in goats. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 113-117 KEYWORDS: GOATS. UROLITHIASIS. SURGICAL OPERATIONS.

A study was conducted in 18 male goats suffering from urethral obstruction and subsequently treated surgically. Rectal temperature did not show significant alterations during pre- and post-operative periods whereas, the respiration and heart rates showed elevated levels before treatment and tended to decline after treatment. The haemoglobin, packed cell volume, total leukocyte count, serum urea nitrogen, creatinine, phosphorus and total protein were higher before treatment, which decreased progressively towards normalcy after the treatment. Neutrophilia was the remarkable finding in all the animals before treatment. Hypocalcaemia and hypoglycaemia were observed in the animals before treatment, which increased progressively towards normalcy after treatment. There was no much alteration in sodium and potassium levels before and after treatment. Hence, clinician in such cases should consider the abnormalities for fluid therapy and immediate treatment to minimize the mortality among goats.

0140. Kumar, Ashwani; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Surgery and Radiology. Mahajan, S.K.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Surgery and Radiology. Singh, K.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Surgery and Radiology. Sangwan, V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Teaching Veterinary Clinical Complex. Chandra, M.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Microbiology. Saini, N.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Surgery and Radiology. Anand, A.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science, Department of Veterinary Surgery and Radiology. Unilateral mastectomy for the management of chronic suppurative mastitis in a goat. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 148-151 KEYWORDS: GOATS. MASTECTOMY. SURGICAL OPERATIONS.

The present case report describes successful surgical management of unilateral mastectomy in a goat under general anesthesia which was presented with a massive hard growth involving the right udder since last one year. The growth was gradually increasing in size and was frequently bleeding from the skin lacerations. Palpation of the growth revealed hard nodular consistency suspecting it to be a tumour. Ultrasonographic examination using 7.0 MHz linear transducer revealed multiple round to oval capsulated cavities filled with echogenic contents. Ultrasound guided fine needle aspiration of the cavity yielded pus like material suggestive of chronic suppurative condition of udder. Exploration of amputated udder revealed multiple nodular masses filled with pus.

0141. Ranjan, Rajeev; Birsa Agriculture University, Ranchi (India). Ranchi College of Veterinary Science and Animal Husbandry, Department of Pharmacology and Toxicology. Ranjan, Amita; Birsa Agriculture University, Ranchi (India). Ranchi College of Veterinary Science and Animal Husbandry, Department of Pharmacology and Toxicology. Roy, Birender Kumar; Birsa Agriculture University, Ranchi (India). Ranchi College of

Veterinary Science and Animal Husbandry, Department of Pharmacology and Toxicology. Prasad, Raju; Birsa Agriculture University, Ranchi (India). Ranchi College of Veterinary Science and Animal Husbandry, Department of Pharmacology and Toxicology. Effect of meloxicam co-treatment on pharmacokinetics of ceftriaxone in sheep. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 216-219 KEYWORDS: SHEEP. MEDICINAL PROPERTIES.

In the present study, effect of meloxicam co-treatment on pharmacokinetic parameters of ceftriaxone (CTRX) was investigated in sheep. Plasma CTRX concentration in meloxicam co-treated animals (G-II) remained higher than in animals given CTRX alone (G-I). Pharmacokinetic analysis revealed that regression coefficient for distribution phase (á), half-life of distribution phase (t1/2á), rate of drug diffusion from peripheral to central compartment (K12), elimination rate constant from central compartment (Kel) and periphera/central compartment drug concentration ratio (P/C) did not differ significantly between the two groups. In G-II, volume of distribution in area under curve (Vdarea)and total body clearance (ClB) were lower, while area under the plasma concentration (AUC) curve was higher than G-I. Comparatively higher value of P/C ratio suggested higher tissue CTRX concentration in G-II. It can be concluded that meloxicam co-treatment enhances the plasma concentration as well as tissue distribution of ceftriaxone.

0142. Anand, Abhishek; Birsa Agricultural University, Ranchi (India). College of Veterinary Sciences and Animal Husbandry, Department of Surgery and Radiology. Dass, L.L.; Birsa Agricultural University, Ranchi (India). College of Veterinary Sciences and Animal Husbandry, Department of Surgery and Radiology. Sharma, A.K.; Birsa Agricultural University, Ranchi (India). College of Veterinary Sciences and Animal Husbandry, Department of Surgery and Radiology. Wound healing potential of sunflower and olive oils in goats. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 225-228 KEYWORDS: GOATS. WOUNDS. HEALING. SUNFLOWER OIL. OLIVE OIL.

A total of 48 wounds of 3x2 cm were created in three groups containing 4 goats each. The wounds of group-I (G-I) and group-II (G-II) were treated with topical application of sunflower oil and olive oil, respectively, whereas the wounds of Group-III (G-III, control) were treated with normal saline solution. The wound healing potential of both the oil with respect to foul smelling, exudation and inflammation and wound contraction were recorded. Wound contraction as

well as epithelialization was conspicuously consistent with sunflower oil followed by olive oil and normal saline. It was concluded that sunflower oil and olive oil enhanced the wound healing with topical application.

0143. Kashyap, D.K.; College of Veterinary Science & A. H, Durg (India). Tiwari, S.K.; College of Veterinary Science & A. H, Durg (India). Giri, D.K.; College of Veterinary Science & A. H, Durg (India). Dewangan, G.; College of Veterinary Science & A. H, Durg (India). Bilateral Squamous cell carcinoma of Nasal passage in a Non-descript Bullock. Veterinary World (India). (Jan 2012) v.5(1) p. 36-37 KEYWORDS: BULLOCKS. CARCINOMA. NOSE. SURGICAL OPERATIONS.
In the present case study, successful surgical management of the bilateral squamous cell carcinoma involving the nasal passage in a nondescript bullock has been reported.

0144. Ramesh, D.; Indian Veterinary Research Institute, Izatnagar (India). Saini, M.; Indian Veterinary Research Institute, Izatnagar (India). Swarup, Devendra; Indian Veterinary Research Institute, Izatnagar (India). Singh, V.K.; Indian Veterinary Research Institute, Izatnagar (India). Upreti, S.; Indian Veterinary Research Institute, Izatnagar (India). Das, Asit; Indian Veterinary Research Institute, Izatnagar (India). Gupta, P.K.; Indian Veterinary Research Institute, Izatnagar (India). Molecular cloning of IFN-alpha in goat (Capra hircus) and black buck (Antelope cervicapra) and evaluation of its expression in goat PBM cells. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 40-43 KEYWORDS: GOATS. IMMUNE RESPONSE. INTERFERONS. PCR.
Type I interferons (IFN-¥á/©¬), play a pivotal role linking innate and adaptive immune responses, of which interferon (IFN- ¥á) alpha (leukocytic interferon) that was initially known for antiviral effect, but in recent days recognized as major key elements in priming innate immune response. Bacterial DNA, rich in CpG motifs, triggers the toll-like receptor-9 mediated signaling through IFN- ¥á. The present study reports cloning and characterization of full length ORF of IFN- ¥á in goat and black buck and its expression profile in goat peripheral blood mononuclear cell culture in presence of Pasteurella multocida DNA. The open reading frame of IFN-¥á in these species was 570 bp as in other ruminant species. The expression of IFN-¥á in presence of Pasteurella multocida DNA (rich in CpG motifs) was higher as compared to unstimulated cells. It is plausible that pasteurella DNA induced TLR9 expression, which contributed to rise in the IFN- ¥á transcript in cultured PBM cells of goat.

0145. Harshit Verma; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Chahota, R.; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Palial, Akanksha; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Patil, R.D.Sharma, Arvind; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Kuradey, N.P.; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Sharma, M.; CSK Himachal Pradesh Krishi Vishvvidyalya, Palampur (India). Effect of seabuckthorn (Hipphophae L.) Leaf extract and seed oil on infected cutaneous wound healing process in rabbit model. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 58-60 KEYWORDS: RABBITS. WOUNDS. HEALING. LEAVES. PLANT EXTRACTS.

In-vivo (wound healing) activity of methanolic extract of SBT leaves and seed oil was studied by excisional-cutaneous wound model in 12 rabbits which were divided into 4 groups. Group 1 was dressed with base, group 2 was dressed with 5% SBT leaf extract, group 3 was dressed with seed oil and group 4 was dressed with 5% povidone iodine. The effect of topical application was judged by clinical observations, haematological parameters and % wound contraction. Thesefindings were also confirmed by histopathological examination. Results from these findings suggested that SBT leaf extract and seed oil may be used as natural antimicrobial agents and significantly enhanced wound contraction in rabbits.

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0146. Rinesh Kumar; Indian Veterinary Research Institute, Izatnagar (India). Paul, Souvik; Indian Veterinary Research Institute, Izatnagar (India). Sachin Kumar; Indian Veterinary Research Institute, Izatnagar (India). Sharma, Anil Kumar; Indian Veterinary Research Institute, Izatnagar (India). Gupta, Sweta; Indian Veterinary Research Institute, Izatnagar (India). Rawat, Ajay Kumar Singh; Indian Veterinary Research Institute, Izatnagar (India). Chaudhuri, Pallab; Indian Veterinary Research Institute, Izatnagar (India). Ray, D.D.; Indian Veterinary Research Institute, Izatnagar (India). Ghosh, Srikant; Indian Veterinary Research Institute, Izatnagar (India). Detection of specific nucleotide changes in the hypervariable region of 16S rDNA gene of Rhipicephalus (Boophilus) microplus and Hyalomma anatolicum anatolicum. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1204-1207 KEYWORDS: HYALOMMA ANATOLICUM. BOOPHILUS. IXODIDAE.

Hyper variable segment of mitochondrial 16S rDNA from different stages of laboratory reared, disease free and acaricide susceptible Hyalomma anatolicum anatolicum and Rhipicephalus (Boophilus) microplus were partially amplified, sequenced and analyzed with the aid of the GenBank database. Thirty conserved genus specific nucleotide change were observed in Hyalommid and Boophilid ticks. These conserved sequences were sufficient to identify embryonic stages of the ticks. These conserved sequences at the genus level could act as biomarker for identification of ticks during epidemiological studies of tick borne diseases, transmitted by Hyalommid and Rhipicephalid ticks.

0147. Swarnkar, C.P.; Central Sheep and Wool, Research Institute, Avikanagar (India). Division of Animal Health. Singh, D.; Central Sheep and Wool, Research Institute, Avikanagar (India). Division of Animal Health. Role of quarantine in management of anthelmintic resistance in strongyle worms of sheep. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 95-99 KEYWORDS: SHEEP. QUARANTINE. ANTHELMINTICS. STRONGYLIDAE.

The present communication highlights the importance of quarantine to prevent the spread of anthelmintic resistance. Three flocks of Patanwadi, Kendrapada and Nali sheep breeds were purchased from their native tracts and brought to organized farms in Rajasthan. In quarantine, detection of anthelmintic resistance was accomplished by in vivo faecal egg count reduction test and in vitro egg hatch assay. Patanwadi sheep from Gujarat were found to harbour tetramisole resistant worms which were susceptible to albendazole, closantel and moxidectin. Kendrapada sheep from Orissa were found to harbor benzimidazole resistant worms which were susceptible to tetramisole and closantel. To prevent entry of tetramisole resistant worms at Central sheep and Wool Research Institute, Avikanagar, Patanwadi sheep were drenched with closantel in quarantine before mixing with general flock. Nali sheep purchased in Sheep Breeding Farm, Fetehpur were found to harbour anthelmintic susceptible worms and were mixed with general flock without any further anthelmintic treatment in order to propagate susceptible worms and increase the size of refugia.

0148. Rawte, D.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Sanyal, P.K.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Kerketta, Archana E.; College of Veterinary

Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Pal, S.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Mandal, S.C.; College of Veterinary Sciences and Animal Husbandry, Durg (India). Department of Veterinary Parasitology. Survivability of mutant strains of Duddingtonia flagrans in goats following oral administration of albendazole. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 106-112 KEYWORDS: GOATS. BENZIMIDAZOLES. MUTANTS.

Local goats of same sex and similar body weights in 3 groups, were fed on barley grain culture of albendazole mutant (DF-ABZ) and ethyl methane sulphonate mutant (DF-EMS) strains and wild strain (DF-CON) of Duddingtonia flagrans separately following deworming at 20 g per animal per day for 10 consecutive days. On 5th day of fungus feeding, goats of all the three groups were intraruminally administered albendazole (5.0 mg kg−1 body weight). Whole blood was collected in heparinised vacutainer tubes at 0, 4, 8, 12, 18, 24, 30, 36, 48 and 72 h post -dosing of albendazole and plasma albendazole metabolite concentrations were determined by high performance liquid chromatography. Simultaneously faecal samples were collected per rectum on the same hour intervals during blood collection and for another two days after completion of blood sampling at 24 h interval and were subjected to coproculture for faecal fungal recovery. Data on fungal recovery was superimposed with the data on plasma drug metabolite concentration so as to deduce the optimum concentration of drug that might exhibit mycostasis. No significant differences in the levels of anthelmintically active moiety albendazole sulphoxide (ABZ-SO) and anthelmintically inactive moiety albendazole sulphone (ABZ-SO2) could be demonstrated in goats fed on barley grain cultures of DF-CON, DF-ABZ and DF-EMS mutants of D. flagrans. However, for ABZ-SO, concentration maximum (Cmax) was significantly more in goats fed on DF-CON compared to DF-ABZ and DF-EMS fed animals and time to reach Cmax (tmax), AUC and t1/2â were significantly less in goats fed DF-CON. For ABZ-SO2, Cmax, tmax and area under concentration-time (AUC) curve were significantly less in DF-CON fed goats and t1/2 â was significantly more in goats fed DF-CON. The ABZ mutant (DF-ABZ) of D. flagrans was more tolerant to in vivo administration of albendazole compared to the wild isolate (DF-CON). However, albendazole exhibited total mycostatic effect on EMS mutant (DF-EMS) of D. flagrans. These findings can be exploited for application of integrated parasite management programmes.

0149. Singh, D.; Central Sheep and Wool research Institute, Avikanagar (India). Division of Animal Health. Swarnkar, C.P.; Central Sheep and Wool research Institute, Avikanagar (India). Division of Animal Health. Epidemiology and management of gastrointestinal nematodes in young sheep at an organised farm in semiarid Rajasthan. Indian Journal of Small Ruminants (India). (Oct 2012) v.18(2) p. 220-224 KEYWORDS: SHEEP. NEMATODE CONTROL. NEMATODA. EPIDEMIOLOGY. RAJASTHAN. HAEMONCHUS CONTORTUS.
The profile of predominant gastrointestinal strongyle worm (Haemonchus contortus) was studied in young sheep at native and exposed stages in order to ascertain the source of infection and to formulate suitable targeted treatment strategy. Lambs born during the major lambing season (December to February) were used for investigation. From 2004 to 2011, a total of 2397 sheep (6–7 months of age) belonging to Malpura and Avikalin breeds were evaluated for intensity of strongyle infection at monthly intervals during wormy season (from July to November). A total of 10058 faecal samples were examined by the modified McMaster technique. The overall monthly mean faecal egg count (FEC) varied significantly (P0.001) from 9.1±3.1 (July) to 3959.0±213.4 epg (September) in males and from 8.7±3.0 (July) to 3157.2±177.3 epg in females of Malpura breed. Likewise in Avikalin sheep it ranged from 12.9±3.7 (July) to 3913.7±203.0 epg (September) and from 12.0±2.9 (July) to 4038.5±232.3 epg (September) in males and females, respectively. Significant (P0.05) variation in mean FECs were observed between the breeds from August to October. The effect of year was significant (P0.001) for all the monthly FECs in both the breeds. It was concluded that in semi-arid conditions of Rajasthan, young sheep (born during spring season) of marketable age could be raised without anthelmintics till July and (gastrointestinal nematode) GIN infection in them could be effectively managed by a single anthelmintic intervention during late monsoon).

0150. Pradeep, B.S.; KVAFSU, Bangalore (India). Veterinary College, Department of Parasitology. Renukaprasad, C.; KVAFSU, Bangalore (India). Veterinary College, Department of Parasitology. Souza, Placid E.D.; KVAFSU, Bangalore (India). Veterinary College, Department of Parasitology. Evaluation of the commonly used acaricides against different stages of the cattle tick Boophilus microplus by using different in vitro tests. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 248-252 KEYWORDS: CATTLE. ACARICIDES.

BOOPHILUS MICROPLUS. BOOPHILUS.
The evaluation of the efficacy of three commonly used acaricides viz. cypermethrin, deltamethrin (0.05, 0.1 and 0.2% concentrations) and amitraz (0.1, 0.2 and 0.3% concentrations) was conducted against the cattle tick Boophilus microplus. Three in vitro methods viz. Tea bag method, filter paper impregnation method and immersion method were used to evaluate the efficacy of the acaricides. Adult immersion test with discriminating doses was also done to know the resistance development if present. Comparison of different in vitro methods was done based on the efficacy against larval stages of the ticks. Among the three acaricides amitraz fared better with no indication of resistance development against B. microplus. Cypermethrin showed 30% and deltamethrin showed 10% resistance against B. microplus. Among different in vitro methods, the immersion method fared better in efficacy followed by tea bag method and filter paper method.

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0151. Renu; Central Avian Research Institute, Izatnagar (India). Yadav, A.S.; Central Avian Research Institute, Izatnagar (India). Tripathi, V.; MJP Rohilkhand University, Bareilly (India). Singh R.P.; Central Avian Research Institute, Izatnagar (India). Salmonella occurrence in chicken eggs and environmental samples and their sero-prevalence in laying hens. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1087-1088 KEYWORDS: EGGS. LAYER CHICKENS. SALMONELLA.
A study was carried out to know the status of Salmonella occurrence in chicken eggs and poultry environment and to find their sero-prevalence in live birds in a selected poultry farm. A total of 720 samples of egg, feed, water cloacal swab and faeces of layers collected from an organized poultry farm were screened for the presence of Salmonella spp, which were isolated from 3.61% of samples. Out of 180 chicken egg, 120 from poultry feed, 120, drinking water; 120, faecal and 180 cloacal swab samples screened, Salmonella spp. were isolated from 8 (4.4%), 3 (2.5), 4 (3.3%), 3 (2.5%) and 8 (4.4%), respectively. For detecting Salmonella infected birds, the micro agglutination test with antigen of S. Typhimurium and S. Gallinarum had a sensitivity of 83.3% and 75% respectively. The prevalence of S. Typhimurium in chicken eggs and environment and their sero-positivity in live birds indicated that a good correlation existed between the sero-positivity in layer birds and their eggs.

0152. Kshirsagar, D.P.; Anand Agricultural University, Anand (India). Veterinary College, Department of Veterinary Public Health. Brahmbhatt, M.N.; Anand Agricultural University, Anand (India). Veterinary College, Department of Veterinary Public Health. Chatur, Y.A.; Anand Agricultural University, Anand (India). Veterinary College, Department of Veterinary Public Health. Sinha, N.; Anand Agricultural University, Anand (India). Veterinary College, Department of Veterinary Public Health. Studies on Occurrence and Distribution of Virulent Strains of Vibrio parahaemolyticus in Finfishes and Prawns from Different Ecosystem of Gujarat (India). Journal of Veterinary Public Health (India). (Jan 2013) v. 11(1) p. 7-10 KEYWORDS: VIBRIO PARAHAEMOLYTICUS. PRAWNS AND SHRIMPS. PATHOGENICITY. VIRULENT PATHOGENS. ECOSYSTEMS. GUJARAT.

In the present study occurrence and distribution of virulent strains of Vibrio parahaemolyticus in finfishes and prawns collected from different ecosystem of Gujarat viz., marine and fresh water were investigated. A total of 155 samples were subjected for isolation of Vibrio parahaemolyticus, of which 18 (11.61%) samples were found to be positive. Among 105 marine fish samples comprising 65 finfishes and 40 prawns, 15 (14.28%) were found to be positive for V. parahaemolyticus and 50 fresh water fish samples comprising 30 finfishes and 20 prawns yielded 3 positive samples (6.0%). Furthermore, all positive V. parahaemolyticus isolates were studied for polymerase chain reaction (PCR) amplification of the toxR, tdh and trh genes. All the biochemically confirmed strains were found to have toxR (368 bp) gene fragment. Only 2 (11.11%) isolates amplified tdh (269 bp) gene. None were found to amplify trh gene.

0153. Yale, G.; Madras Veterinary College, Chennai (India). Department of Veterinary Epidemiology and Preventive Medicine. Ganesan, P.I.; Madras Veterinary College, Chennai (India). Department of Veterinary Epidemiology and Preventive Medicine. Pandian, A.S.S.; Madras Veterinary College, Chennai (India). Department of Veterinary Epidemiology and Preventive Medicine. Dog Bite Pattern and Response of Victims in Chennai. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 27-31 KEYWORDS: RABIES. DOGS. BITES. DISEASE TRANSMISSION. TAMIL NADU.

This study was conducted by interviewing people attending the anti-rabies ward for post exposure rabies vaccination in a Government General Hospital in Chennai. One hundred and ninety dog bite patients were randomly selected for the

interview during October and November of 2011. The study revealed that age and education status of victim did not have significant effect on time to seek vaccination and degree of bite but both were significantly affected by type of dog that bit the victim. Education status had significant effect on provoking the dog, while age did not. It was also found that type of dog had a significant effect on vaccination status of dog, bite by provoking and degree of bite. The study also confirmed that that dog bite cases, degree of bite and educational status of victims were uniformly distributed around whole of Chennai. This manifests the change in trend of rabies awareness of the public and their response to dog bite.

0154. Rashid, M.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Kotwal, S.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Agarwal, R.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Ahmad, Mudasir; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Sailo, B.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Anjay; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Production of Verocytotoxin and Presence of stx Gene in Escherichia coli Strains from Diarrhoeic and Non-Diarrhoeic Cattle and their Handlers. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 33-38 KEYWORDS: CATTLE. DIARRHOEA. ESCHERICHIA COLI.

The present study was conducted to know the cytopathic effect of verotoxin producing E. coli on the vero cells. A total of 230 samples from animal and animal handlers were processed for the isolation of E. coli. Out of 121 E. coli isolated from those samples, 77 were serogrouped into 25 serovars and all the 121 isolates were screened by PCR, where 52 (42.97%) were found possessing stx genes, which comprised of 20.66% stx 1 , 16.52% stx 2 and 5.78% both stx 1 and stx . The cell free supernatant of ten Verotoxin Producing E. coli isolates (O15, O22, O55, O60, O71, O86, O102, O111, O116 and O139) possessing stx genes were tested for cytotoxicity on vero cell lines. Microscopically undiluted culture filtrates of all the ten strains induced the cytopathic effect within 24 h. A dilution of 1/4, 1/16, 1/64 and 1/ 256 affected 50% of the vero cells on 1 st , 2 nd , 3 rd and 4 th 2 day post-inoculation, respectively, in O15, O55, O60, O71, O86, O102, O111, O116 and O139 strains. The strain O22 affected 50% of the cells on day 3 and 4 with a

dilution of 1/4 and 1/16, respectively. The cytopathic effect advanced with time, maximum effect was observed in 4 days and varied with strain dilution from 16 to 256.

0155. Sumithra, T.G.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Chaturvedi, V.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. P.K. Gupta; Indian Veterinary Research Institute, Izatnagar (India). Division of Animal Biotechnology. Patel, C.L.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Joseph, B.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Rai, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Sunita, S.C.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Kollannur, J.D.; Indian Veterinary Research Institute, Izatnagar (India). Division of Bacteriology and Mycology. Application of Random Amplified Polymorphic DNA Analysis in Discrimination of Salmonella Typhimurium Isolates of India. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 43-50 KEYWORDS: SALMONELLA TYPHIMURIUM. EPIDEMIOLOGY. RAPD.

0156. Kaur, S.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Bhilegaonkar, K.N.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Agarwal, R.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Dubal, Z.B.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Lokesh, K.M.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Rawat, s.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Quantitative Detection of group A rotavirus in humans and animals by real time reverse transcription-polymerase chain reaction. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 1-6 KEYWORDS: ROTAVIRUS. CALF DIARRHOEA ROTAVIRUS. PCR. FAECES.

The detction as well as quantification of group A rotavirus in the vdiarrhoeic faecal samples from humans and animalswas carried out by real time reverse transcription-polymerase chain reaction assayby using primers from conserved region of gene segment 9 in group A rotaviruses. The standardized test detected group A rotavirus in range of 1.70x10 to 1.28x10 copies in humans.

0157. Verma, Rishendra; Indian Veterinary Research Institute, Izatnagar (India). Sena, D. Suchitra; Indian Veterinary Research Institute, Izatnagar (India). Sharma, N.; Indian Veterinary Research Institute, Izatnagar (India). Alex, K.; Indian Veterinary Research Institute, Izatnagar (India). Pamane, R.S.; Indian Veterinary Research Institute, Izatnagar (India). Rajendra Singh; Indian Veterinary Research Institute, Izatnagar (India). Pathak, K M L; National Research Centre on Camel, Bikaner (India). Molecular diagnosis of Mycobacterium bovis as the cause of tuberculosis in a camel. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1126-1128 KEYWORDS: CAMELS. MYCOBACTERIUM BOVIS. TUBERCULOSIS.

An adult male camel was diagnosed with tuberculosis (TB). It exhibited typical TB lesions in the lungs, liver and spleen. The histopathological examination of sections of tissues revealed presence of acid-fast bacilli. Mycobacteria were isolated from the camel’s lung and were identified as the member of Mycobacterium tuberculosis complex (MTBC) subsequently confirmed as M. bovis by biochemical tests and multiplex PCR where 445 bp band indicative of MTBC and 823 bp band indicative of M. bovis was observed.

0158. Pradhan, Jyotirmayee; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Sahu, Swagatika; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Marhual, Nilima P.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Mishra, B.K.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Das, B.K.; Central Institute of Freshwater Aquaculture, Bhubaneswar (India). Antibacterial properties of freshwater Microcystis aeruginosa (Kütz) to bacterial pathogen–a comparative study of bacterial bioassays. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1266-1271 KEYWORDS: ANTIMICROBIAL PROPERTIES. AEROMONAS HYDROPHILA. CYANOBACTERIA. MICROCYSTIS.

Antimicrobial activities and minimum inhibitory concentration (MIC) values of various solvent extracts of Microcystis aeruginosa were studied. When tested against 17 Gram negative fish pathogenic bacteria belonging to 4 strains of Aeromonas hydrophila, 2 strains of Pseudomonas putida, 2 strains of P. aeruginosa, 2 strains of P. fluorescens, 6 Vibrio species Edwardsiella tarda and 6 animal serotypes of Escherichia coli, all the solvent extracts showed positive response except aqueous extract. Hot ethanolic extract showed maximum zone size (19 mm) against A. hydrophila

(AH1) and E. coli (O111). The crude ethanolic extract was partially purified employing thin layer chromatography (TLC) and silica gel column chromatography techniques. Both crude as well as polar fractions showed positive results against selected pathogens. The antibacterial activities support that freshwater Cyanobacteria are still a promising source of new bioactive natural products. It is possible to develop specific microalgal based biologically active compound for aquaculture and to avoid resistance development against antibiotics used in human medicine.

0159. Sonawane, G.G.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal HealthSagar, P.K.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal HealthTripathi, B.N.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal HealthKumar, R.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal HealthSingh, F.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal Health Kumar, J.; Central Sheep and Wool Research Institute, Avikanagar (India). Division of Animal Health. Detection of Mycobacterium avium subspecies Paratuberculosis by 251 gene locus polymerase chain reactions in the tissues of naturally infected sheep. Indian Journal of Small Ruminants (India). (Apr 2012) v.18(1) p. 90-94 KEYWORDS: SHEEP. MYCOBACTERIUM AVIUM. PARATUBERCULOSIS. PCR.

In the present study, a PCR targeting 251 gene locus was developed for detection of Mycobacterium avium subsp. paratuberculosis and applied on suspected and healthy tissue samples and the results were compared with microscopic examination of Ziehl Neelsen's (ZN) stained smears. Out of 15 suspected tissue samples, 13 (87%) and 12 (80%) were found positive by 251 gene locus PCR and smear examination, respectively. Both tests were found positive in 11 cases and negative in one case. Two cases were detected as positive by 251 gene locus PCR, which were negative for acid fast bacilli in ZN stained smears. The higher sensitivity of PCR assay in comparison to ZN method suggested that 251 gene locus PCR assay can be used as a rapid and confirmatory diagnostic tool for investigation of Johne's disease.

0160. Nelapati, S.; Sri Venkateswara Veterinary University, Tirupathi (India). Veterinary College. Nelapati, K.; Sri Venkateswara Veterinary University, Tirupathi (India). Veterinary College. Chinnam, B.K.; Sri Venkateswara Veterinary University, Tirupathi (India). Veterinary College. Vibiro parahaemolyticus-

an emerging foodborne pathogen. Veterinary World (India). (Jan 2012) v.5(1) p. 48-62 KEYWORDS: VIBRIO PARAHAEMOLYTICUS. GRAM NEGATIVE BACTERIA. FOODBORNE DISEASES.

Vibiro parahaemolyticus is a halophilic gram negative, motile, oxidase positive, straight or curved rod-shaped, facultative anaerobic bacteria that occur naturally in the marine environment. They form part of the indigenous microflora of aquatic habitats of various salinity and are the major causative agents for some of the most serious diseases in fish, shellfish and penacid shrimp. This human pathogen causes acute gastroenteritis characterized by diarrhea, vomiting and abdominal cramps through consumption of contaminated raw fish or shellfish. V. parahaemolyticus is the leading cause of gastroenteritis due to the consumption of seafood worldwide. The incidence of V. parahaemolyticus infection has been increasing in many parts of the world, due to the emergence of O3 :K6 serotype carrying the tdh gene which is responsible for most outbreaks worldwide. The pathogenicity of this organism is closely correlated with the Kanagawa phenomenon (KP +) due to production of Kanagawa hemolysin or the thermostable direct hemolysin (TDH). The TDH and TRH (TDH-related hemolysin) encoded by tdh and trh genes are considered to be important virulence factors.

0161. Tufani, N.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Makhdoomi, D.M.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Hafiz, A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Epidemiology and therapeutic management of bovine masititis. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 148-151 KEYWORDS: BOVINAE. BOVINE MASTITIS. EPIDEMIOLOGY. DRUG THERAPY.

The overall prevalence of mastitis recorded during 2008–2009 was 8.08% (63/780). Breed wise prevalence was 61.90%, 31.75% and 6.35% in Crossbred Jersey, Crossbred Holstein Friesian and Zebu Hill cows respectively. It was highest during spring (42.86%) followed by winter (34.92%), summer (15.87%) and least during autumn (6.35%). After 252 milk samples testing by different mastitis tests and on clinical observations, 151 (60.16%) quarters were affected with different types of mastitis. The animals were highly affected with acute (55.56%) followed by sub-acute (25.40%) and

chronic (19.05%) mastitis. The incidence of mastitis was similar in 1st (15.87%) and 2nd (15.87%) parity whereas, 20.63%, 26.98%, 12.70% and 7.94% in 3rd, 4th 5th and 6th parity, respectively. Moreover, the incidence was highest in early (52.38%) followed by mid (26.98%) and late (20.63%) lactation. The predominant major mastitis-causing organisms isolated were Staphylococcus spp. 42 (66.67%) and E. coli 10 (15.87%) and other 11 (17.46%). The highest clinical recovery rate was recorded in the animals treated with Gentamicin (84.21%), followed by Enrofloxacin (80.77%), Ciprofloxacin (80.00%), Ofloxacin (80.00%), Amoxicillin-Cloxacillin (75.00%) and Ampicillin-Cloxacillin (50.00%) within 3.32, 3.46, 4.00, 4.50, 4.50 and 4.75 days (average), respectively. However, fibrosed cases required at least 7–9 days for complete recovery.

0162. Choudhary, U.K.; Birsa Agricultural University, Ranchi (India). Faculty of Veterinary Science & Animal Husbandry. Tiwary, B.K.; Birsa Agricultural University, Ranchi (India). Faculty of Veterinary Science & Animal Husbandry. Prasad, A.; Birsa Agricultural University, Ranchi (India). Faculty of Veterinary Science & Animal Husbandry. Ganguly, S.; W.B. University of Animal and Fishery Sciences, Kolkata (India). Study on incidence of infectious bursal disease in and around Ranchi. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 156-159 KEYWORDS: CHICKENS. GUMBORO DISEASE. MORBIDITY. BIHAR.

The present study was carried out to determine the seroprevalence of infectious bursal disease (IBD) with its incidence rates in different breeds, age groups and sex of chickens and to find out its seasonal variability of occurrence. A total of 469 sera samples comprised of 237 samples from broiler chicks and 232 from local breeds of chicken have been studied in the present investigation for the determination of incidence of IBD by Agar gel precipitation test in and around Ranchi and the overall incidence were recorded to be 33.90%. The commercial broiler chicks showed higher seroprevalence (37.97%) than local breeds (29.74%). The incidence of IBD was also found to be highest in the age group on 4–7 weeks of chickens (43.18%) with higher rate of infection in male chickens (35.12%). A higher rate of infection was also recorded in the monsoon (36.73%) than the winter season (30.83%) in the present study. The determination of incidence of IBD among local deshi chicken breeds of backyard farms of Ranchi and its seasonal variations of occurrence in the present study are the first of its kind.

0163. Bhanot, Vandna; Lala Lajpat Rai University of Veterinary and Animal Sciences, Karnal (India). Chaudhri, S.S.; Lala Lajpat Rai University of Veterinary and Animal Sciences, Karnal (India). Bisla, R.S.; Lala Lajpat Rai University of Veterinary and Animal Sciences, Karnal (India). Singh, Harpreet; Lala Lajpat Rai University of Veterinary and Animal Sciences, Karnal (India). Retrospective study on prevalence and antibiogram of mastitis in cows and buffaloes of eastern Haryana. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 160-163 KEYWORDS: COWS. WATER BUFFALOES. BOVINE MASTITIS. DRUG THERAPY. HARYANA.

Retrospective study on prevalence and antibiogram of mastitis in cows and buffaloes of Eastern Haryana over a period of six years from 2004 to 2009 revealed that mastitis prevalence was 85.3% in cows and 78.1% in buffaloes, respectively. The major factors influencing mastitis prevalence was number of lactations and higher rainfall. Based on cultural, morphological and biochemical examination of mastitis milk samples of positive mastitis cases, the predominant bacteria was Staphylococcus(43.6%) followed by Streptococcus (21.8%), Escherichia coli(16.3%), Klebsiella (5.4%), Corynebacterium pyogenes (5.4%), Pseudomonas aeruginosa (3, 6%), and) Bacillus (3.6%). Antibiogram revealed enrofloxacin to be the most sensitive drug (86.62% and 87.96%) in cows and buffaloes.

0164. Sarangi, Laxmi Narayan; O.U.A.T., Bhubaneswar (India). Odisha Veterinary College, Department of Bacteriology and Virology. Panda, H.K.; O.U.A.T., Bhubaneswar (India). Odisha Veterinary College, Department of Bacteriology and Virology. Isolation, characterization and antibiotic sensitivity test of pathogenic Listeria species in livestock, poultry and farm environment of Odisha*. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 242-247 KEYWORDS: CATTLE. GOATS. POULTRY. SHEEP. SWINE. LISTERIA. LISTERIA MONOCYTOGENES. ORISSA.

The present investigation was undertaken to study the occurrence of Listeria species in different animal and farms of Odisha. Atotal of 456 samples including 386 clinical samples and 70 environmental samples collected from different animals like cattle, sheep, goat, pig and poultry of different farms were screened for presence of Listeria species and 33 Listeria species were isolated which on pathogenicity testing revealed 5 L. monocytogenes and 3 L. ivanoviito be pathogenic. On biochemical characterization they were identified as L. monocytogenes, L. ivanovii, L. innocua, L. welshimeri, L. seeJigeri and L. grayi with prevalence rate of

1.75, 0.65, 1.75, 1.53, 1.31 and 0.21 percent respectively. Out of these isolates 5 L. monocytogenes and 2 L. ivanovii were found to be pathogenic in nature. Similarly prevalence of Listeria in different animals revealed 6.49% from cattle, 10% from sheep, 12.5% from goat, 15.83% from pig and 7.14% from poultry. Screening of environmental samples revealed isolation of 4 Listeria species with sewage having the highest prevalence followed by soil. Antibiotic sensitivity study indicated high susceptibility to ciprofloxacin, livofloxacin, amoxicillin, enrofloxacin where as high resistance were observed against gentamycin, penicillin G, cephadroxil, ceftriaxone, cephotaxim and oxytetracycin.

0165. Laha, R.; ICAR Research Complex for NEH Region, Umiam (India). Division of Veterinary Parasitology. Das, M.; ICAR Research Complex for NEH Region, Umiam (India). Division of Veterinary Parasitology. Goswami, A.; ICAR Research Complex for NEH Region, Umiam (India). Division of Veterinary Parasitology. Singh, Pramod; ICAR Research Complex for NEH Region, Umiam (India). Division of Animal Nutrition. A clinical case of Babesiosis in across bred cow of Meghalaya. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 302-305 KEYWORDS: COWS. BABESIOSIS.

A cross-bred cow of aged four years, maintained in the dairy farm of ICAR research complex for NEH Region, Umiam, Meghalaya, in its 3 months of lactation was found suffering from high rise of temperature (106.4□‹F), haemoglobinurea, anorexia, decrease milk production, anaemia and diarrhoea. Blood samples of this cow were collected in sterile condition on the day of acute stage of infection, 48 hours post treatment (PT) and then at an interval of 3 days up to a period of 21 days post treatment for diagnosis of the infection as well as to monitor the infection. Each and every time the collected blood samples were processed for diagnosis of Babesiosis using conventional parasitological and molecular techniques using polymerase chain reaction (PCR). The body of the cow was thoroughly searched for presence of ticks, if any. The disease was diagnosed as B. bigemina infection after examination of Giemsa stained blood smears and PCR using B. bigemina specific primers. The tick Boophilus microplus was found to present in the body of the cow. The animal was treated successfully with a single injection of 4,4□Œ Diamidine diazoamine benzene diaceturate (Berenil) with recommended doses and no parasite was detected either by examination of Giemsa stained blood smears or PCR after a period of 48 hours PT onwards.

0166. Wahan, S.A.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Sandhu, B.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Singh, C.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Gupta, K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Sood, N.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Kaw, A.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Comparison of clinico-pathological, immunohistochemical and immunofluorescent techniques for diagnosis of rabies in animals. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 3-8 KEYWORDS: COWS. WATER BUFFALOES. DOGS. RABIES. DIAGNOSIS. IMMUNOFLUORESCENCE.

Rabies is a fatal zoonotic disease, affecting animal species and human beings. In present investigation, sensitivity of immunohistochemistry and histopathology of brain tissues of 38 rabies-suspected animals was compared. Out of 38 rabies-suspected cases, 18 and 16 cases were found positive by immunohistochemistry and histopathology respectively. Sensitivity of immunohistochemistry and histopathology in comparison to FAT on brain tissue smears was found to be 94.74 and 84.21% respectively. Hundred neurons per case were observed for negri bodies and number of negri bodies in positive neurons. Average number of negri bodies detected per neuron by IHC and histopathology was 2.71 and 1.94 respectively. With IHC, 58.83% neurons were positive for Negri bodies and 47.94% with H and E staining. The amount of rabies viral antigen/number of Negri bodies detected with IHC was much more abundant than could be expected from the corresponding H and E stained sections. In cattle and buffaloes, important clinical signs of rabies were bellowing, anorexia, pyrexia and hypersalivation whereas, in dogs change in behaviour, aggressiveness and anorexia were the most common clinical signs. Immunohistochemistry in formalin-fixed paraffin embedded tissue sections was found more sensitive than histopathology for detection of negri bodies/rabies antigen and therefore, of immense value for retrospective stuies.

0167. Gupta, V.K.; Central Institute for Research on Goats, Makhdoom (India). Gupta, G.; Central Institute for Research on Goats, Makhdoom (India). Pathak, M.; Central Institute for Research on Goats, Makhdoom (India). Kumar, A.; Central Institute for Research on Goats, Makhdoom (India). Vihan,

V.S.; Central Institute for Research on Goats, Makhdoom (India). Milk-enzyme linked immunosorbent assay for serological diagnosis of Brucella melitensis infection in goats. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 15-19 KEYWORDS: GOATS. BRUCELLA MELITENSIS. BRUCELLA. ELISA. DIAGNOSIS.

The milk- ELISA (m-ELISA) was performed with milk samples (n, 980) taken from organized farms and field goats from northern India. Milk samples were obtained in parallel with serum samples. The assays used B. melitensis recombinant outer membrane protein 31 (OMP31) as antigen. The sensitivity of m-ELISA, serum-ELISA, SAT and RBPT was 95.45%, 90.1%, 54.54% and 68.18% respectively. The specificity of m-ELISA, serum-ELISA, SAT and RBPT was 95.5, 90.9, 77.28 and 81.81% respectively. However, the results obtained with the m-ELISA were in good agreement with those of the serum-ELISA, SAT and RBPT under field and farm conditions. The m-ELISA can be used as an alternative to the serum-ELISA for diagnosing B. melitensis infection in goats.

0168. Kumar, V.; Indian Veterinary Research Institute, Kolkata (India). Eastern Regional Station. Das, S.C.; Indian Veterinary Research Institute, Kolkata (India). Eastern Regional Station. Guin, S.; Indian Veterinary Research Institute, Kolkata (India). Eastern Regional Station. Malik, S.V.S.; Indian Veterinary Research Institute, Kolkata (India). Eastern Regional Station. Virulence, enterotoxigenicity and antibiotic profile of Staphylococcus aureus from buffalo clinical mastitis. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 48-51 KEYWORDS: WATER BUFFALOES. MASTITIS. STAPHYLOCOCCUS AUREUS. PCR. PATHOGENICITY. ENTEROTOXINS.

Antibiotic resistant Staphylococcus aureus are frequent in mastitis cases and food intoxication is common in consumption of suspicious milk and milk products where virulent and enterotoxigenic isolates of S. aureus are implicated. The study was aimed to determine the presence of virulence genes and enterotoxigenicity status in antibiotic resistant and sensitive isolates of S. aureus from buffalo mastitis cases. Isolates (70) of S. aureus were recovered from buffaloes (75) with clinical-mastitis of different periurban herds and were tested for antimicrobial susceptibility against penicillin G (10units), cephotaxime (5µg), ciprofloxacin (30µg), cloxacillin (10µg), amoxyclav (30µg) and methicillin (30µg) by disc diffusion method and further characterized for biochemical characteristics and virulence (coa and nuc) and enterotoxigenic genes (entA, entB and entC). All the strains

were positive for coagulase and 65 (92.85%) were for thermonuclease production. PCR results showed that except a few, the isolates harbouring the coagulase (coa) and thermonucelase (nuc) genes were resistant to used antibiotics. Six isolates were positive for enterotoxin gene A (entA) and all were antibiotic resistant except 1 isolate which is sensitive to methicillin. Similarly, 11 isolates were carrying enterotoxin gene B (entB) and were resistant to penicillin-G, cephotaxime, cloxacillin and amoxyclav and 9 and 5 were resistant to ciprofloxacin and methicillin; however, 6 and 2 entB isolates were sensitive to methicillin and ciprofloxacin, respectively. Nevertheless, entC gene was not detected in any of the 70 isolates. All the enterotoxigenic isolates were carrying virulence genes (coa, nuc) and except few all of them were resistant to the used antibiotics. It suggested that in majority, milk or milk products of buffalo mastitis source that is refractory to antibiotic treatment harbour the virulent and enterotoxigenic S. aureus and pose an alarm to public health in terms of staphylococcal food intoxication.

0169. Malik, P.; National Research Centre on Equines, Hisar (India). Kumar, R.; National Research Centre on Equines, Hisar (India). Gulati, B.R.; National Research Centre on Equines, Hisar (India). Isolation and pathogenic attributes of Escherichia coli isolates from diarrhoeic foals. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 52-54 KEYWORDS: FOALS. DIARRHOEA. ESCHERICHIA COLI. PATHOGENICITY.
A total of 73 isolates of Escherichia coli were recovered from 107 rectal/faecal swabs/faecal samples of diarrhoeic foals at organized studs in Uttar Pradesh and Haryana. The isolates belonged to 38 different serogroups with maximum number falling in O101 (10), O9 (5), O91 (4), O8 (4), O6 (3) and O156 (3). All the isolates were resistant to one or more antibiotics. The pathogenic nature of isolates was indicated by cytotoxigenicity (18 of 73 isolates) and mice pathogenicity (28 of 73 isolates) assays.

L74 Miscellaneous animal disorders

0170. Gera, Sandeep; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). Guha, Anirban; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). Assessment of acute phase proteins and nitric oxide as indicator of subclinical mastitis in Holstein × Haryana cattle. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1029-1031 KEYWORDS: CATTLE. BOVINE MASTITIS.
The present investigation was conducted to evaluate acute

phase proteins alpha 1 anti trypsin, alpha 1 acid glycoprotein and fibrinogen) and NOx as indicators of subclinical mastitis (SCM) in 212 Holstein □~ Hariana (F 1) cow milk. The assay revealed that fibrinogen was below detection level in both healthy and diseased milk. Somatic cell count (SCC), alpha 1 anti trypsin and NOx increased significantly high in SCM milk, whereas, the increase of acid glycoprotein was noted to be significant. From the udder profile correlation coefficient it was observed that log 10 1 SCC vs alpha anti trypsin and NOx was significant (0.257 and 0.216, respectively) and alpha 1 acid glycoprotein was significant (0.173) in SCM milk only. Normal milk log SCC was significantly correlated to NOx (0.152). Highly significant correlation was observed between alpha 1 10 - anti trypsin and NOx (0.245) in SCM milk only. Correlation between alpha acid glycoprotein and NOx was significant (0.162). This illustrates that these components are linked with each other in SCM milk. Alpha 1 anti trypsin followed by alpha acid glycoprotein were most sensitive, specific and accurate of the three investigated component. Though the magnitude of percent specificity for each parameter is less but their sensitivity is very high, which implies that they can detect SCM at an early stage. Thus, it can be concluded that alpha - anti trypsin and alpha acid glycoprotein are indicators of bovine SCM, the former being the better.

0171. Saha, T.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Guha, C.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Biswas, U.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Chakraborty, D.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Sadhukhan, T.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Chakraborty, G.C.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Isolation and identification of mycoplasmas from respiratory disease affected broiler birds in West Bengal. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1124-1125 KEYWORDS: BROILER CHICKENS. RESPIRATORY DISEASES. MYCOPLASMA. WEST BENGAL.

An attempt was made to isolate and identify Mycoplasma spp. From respiratory disease affected dead broiler birds. Samples from trachea, lungs and air-sacs were taken into PPLO broth (with mycoplasma enrichment supplements) for the isolation of organisms and were identified on the basis of morphological, biochemical and serological characters. Out of 121 samples screened from same number of farms only 10

Mycoplasma spp. were identified. M gallisepticum were isolated from 8 farms and the rest 2 isolates were either M. gallinarum or M. iners.

0172. Gaurav, A.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences, Department of Veterinary Public Health. Singh, S.P.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences, Department of Veterinary Public Health. Gill, J.P.S.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences, Department of Veterinary Public Health. Kumar, D.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences, Department of Veterinary Public Health. Standardization of PCR Assay for the Confirmation of Faecal Isolates of Shigella spp. By targeting ipaH Gene. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 73-75 KEYWORDS: SHIGELLA. DIARRHOEA. PCR.
Shigellosis is an infectious disease, a major public-health problem in developing countries which is often associated with significant morbidity and mortality. The present study was undertaken to standardize PCR assay for the confirmation of Shigella spp. isolated from faecal samples. All 8 Shigella isolates identified to be Shigella spp. by cultural and biochemical tests were further confirmed by PCR, targeting ipaH gene which yielded specific amplification of 619 bp gene segment.

0173. Verma, Yamini; M.P. Pashu Chikitsa Vigyan Vishwa Vidyalaya, Jabalpur (India). Swamy, Madhu; M.P. Pashu Chikitsa Vigyan Vishwa Vidyalaya, Jabalpur (India). Vyas, U.K.; M.P. Pashu Chikitsa Vigyan Vishwa Vidyalaya, Jabalpur (India). Prevalence and pathology of liver infections in buffaloes. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1129-1131 KEYWORDS: WATER BUFFALOES. LIVER DISEASES. HISTOPATHOLOGY.
Livers (2119) of slaughtered buffaloes were examined and out of these 476 livers exhibiting gross alterations were subjected to microscopic examination. An overall prevalence of liver affections was observed in 476 (22.46%) out of 2119 cases. The prevalence and significant alteration of various parasitic conditions was observed in 295 cases out of 476 (61.97%). The parasitic conditions comprised hypertrophy and hyperplasia of bile duct with extensive fibrosis of biliary mucosa due to amphistomiasis (3.78%), negligible to

extensive changes around cysts of cysticercosis (2.10%),biliary ductular proliferation and peribiliary fibrosis due to facsioliasis (14.28%), enlargement of liver with fibrosis around cysts due to hydatidosis (23.53%) and granuloma, sclerosis and angiomatosis due to schistosomiosis (18.28%). The other conditions were degeneration and necrosis (13.46%), circulatory disorders (8.82%), cirrhosis (5.25%), abscess (3.78%), pigmentation (2.73%), RES response (3.78%) and neoplasms (0.21%).

0174. Varun; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Sharma, Sumeet; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Sandhu, H.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Gosal, Navjot S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Clinical manifestations and oxidative profile in sub-chronic oral molybdenum toxicity in buffalo calves. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1138-1140 KEYWORDS: CALVES. TOXICITY. MOLYBDENUM.

Repeated oral administration of sodium molybdate 3 mg/kg/day for 90 consecutive days produced characteristic clinical signs of sub-chronic molybdenois, i.e. rough hair coat, diarrhoea, dullness and stiffness of joints in buffalo calves. Although, sodium molybdate did not cause significant alterations in the extent of lipid peroxidation and concentration of glutathione-S-transferase, blood glutathione levels were depleted. Similarly, significant decline in the values of superoxide dismutase and glutathione reductase was observed. In conclusion, sub chronic molybdenosis produced varying degree of toxic signs and exerted oxidative stress in buffalo calves.

0175. Kashoo, Zahid Amin; Indian Veterinary Research Institute, Izatnagar (India). Singh, Vijendar Pal; Indian Veterinary Research Institute, Izatnagar (India). Rana, Rajneesh; Indian Veterinary Research Institute, Izatnagar (India). Sankar, Muthu; Indian Veterinary Research Institute, Izatnagar (India). Gazalli, Humaira; Indian Veterinary Research Institute, Izatnagar (India). Cheema, Pawanjit Singh; Indian Veterinary Research Institute, Izatnagar (India). Evaluation of different serological tests for diagnosis of contagious agalactia in goats. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1201-1203 KEYWORDS: AGALACTIA. GOATS. DIAGNOSIS. ELISA. HAEMAGGLUTINATION TESTS. AGGLUTINATION TESTS.

Contagious agalactia (CA) is an economically important disease of small ruminants caused by Mycoplasma agalactiae and the disease is characterized by mastitis, arthritis, keratoconjunctivitis and sometimes abortion. The diagnosis of CA in field is mainly based on serological tests with varying levels of specificity and sensitivity. It is important to compare the simple and available tests for routine diagnosis of the disease under field conditions. Therefore, the present study was designed to find out the field applicability of 3 serological test, viz. slide agglutination test (SAT) with coloured antigen, indirect haemagglutination test (IHA) and enzyme-linked immunosorbent assay (ELISA). Serum samples (493) from goats of various parts of Uttar Pradesh and Uttrakhand were collected and screened for CA by SAT, IHA and ELISA. Based on this study, ELISA is found a good serological test for diagnosis of CA. However, SAT can also be used in field because of its simplicity, less time consuming and easy to perform under field conditions. Further, 74% sensitivity and 96% specificity was observed in SAT and 56% & 92% of sensitivity and specificity in IHA compared with ELISA.

0176. Vijayraj, D.; Assam Agricultural University, Guwahati (India). Roy, D.C.; Assam Agricultural University, Guwahati (India). Deka, D.K.; Assam Agricultural University, Guwahati (India). Nitric oxide donors inhibit calcium stimulated contraction in detrusor muscle of goat. Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1208-1211 KEYWORDS: GOATS. BLADDER. MUSCLES.

The present study was undertaken to examine the role of nitric oxide on the modulation of Ca in the urinary bladder muscles of goat. CaCl 2 (10 -5 M – 10 -2 M) induced cumulative concentration-contraction curves were generated at an increment of 0.5 log unit in isolated detrusor muscle strips in organ bath studies. SNP (sodium nitroprusside) and SIN–1(3-morpholino-sydnonimines) at a concentration of 10 -6 M and 10 -5 M were used to study the role of NO on extra cellular Ca 2+ . Results were compared with a known L-type Ca 2+ channel blocker, nifedipine (10 M). In another set of experiments, to study the role of NO on intra-cellular Ca 2+ , carbachol (CCh, 10 -4 M) induced sub-maximal contractions of detrusor tissues were produced in Ca 2+ -free EGTA containing PSS either in the absence or presence of SNP and SIN-1. The present investigation showed that NO donors SIN-1 and SNP concentration dependently shifted the concentration-contraction curves of CaCl The NO donors also inhibited the CCh-induced contraction. Thus, it can be concluded that SNP and SIN-1 are inhibitors of both

extracellular as well as intracellular Ca in goat detrusor muscle.

0177. Patil R.J.; Central Avian Research Institute, Izatnagar (India). Division of Physiology and Reproduction. Sirajudeen, M.; Central Avian Research Institute, Izatnagar (India). Division of Physiology and Reproduction. Tyagi, J.S.; Central Avian Research Institute, Izatnagar (India). Division of Physiology and Reproduction. Moudgal, R.P.; Central Avian Research Institute, Izatnagar (India). Division of Physiology and Reproduction. Mohan Jag; Central Avian Research Institute, Izatnagar (India). Division of Physiology and Reproduction. In vivo Efficacy of Melatonin and L-Tryptophan Against Aflatoxin Induced Endogenous Toxicities in Broiler Chickens. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 117-124 KEYWORDS: BROILER CHICKENS. ESSENTIAL AMINO ACIDS. AFLATOXINS. TOXICITY.

The aim of the study was to compare protective effects of melatonin and its precursor (L-tryptophan) against peroxidative damages induced by dietary aflatoxin in broiler chickens. One-hundred eighty Naked neck chicks were distributed into six dietary treatments each with three replicates of 10 chicks and were reared from 0–6 weeks, and fed either a basal feed as untreated control or the same with aflatoxin at 0.5 mg/kg feed, melatonin at 20 mg/kg in feed + 20 mg/kg intra-peritoneally, L-tryptophan at 250 mg/kg in feed, combined treatment of aflatoxin and melatonin at above doses or combined treatment of aflatoxin and L-tryptophan at above doses. The diets were formulated to provide 23% CP and 2800 kcal ME/kg in starter ration and 20% and 2900 kcal ME/kg in finisher ration. The experimental diets were offered ad libitum to birds with free access to water during the experimental period. Inclusion of aflatoxin in the diet at 0.5 mg/kg caused significant reduction in activities of antioxidant enzymes studied and elevated lipid peroxidation in tissues. Supplementation of melatonin or L-tryptophan in the diet of toxin-fed birds restored the enzymatic activities of superoxide dismutase and catalase in liver and erythrocytes, besides reducing the levels of lipid peroxidation. This study shows that dietary supplementation of either melatonin or L-tryptophan attenuated the oxidative injuries induced by aflatoxin in young broiler chicken.

0178. Chauhan, P.M.; Sardarkrushinagar Dantiwada Agricultural University, Dantiwada (India). College of Veterinary Science and Animal Husbandry, Department of Gynaecology and Obstetrics. Nakhashi, H.C.; Sardarkrushinagar Dantiwada

Agricultural University, Dantiwada (India). College of Veterinary Science and Animal Husbandry, Department of Gynaecology and Obstetrics. Suthar, B.N.; Sardarkrushinagar Dantiwada Agricultural University, Dantiwada (India). College of Veterinary Science and Animal Husbandry, Department of Gynaecology and Obstetrics. Parmar, V.R.; Amul Dairy, Anand (India). Dicephalus, Monostomus, Tetraopthalmus, Dipus, Dibrachius, Dicandatus monster in a Kankrej Cow. Veterinary World (India). (Jan 2012) v.5(1) p. 38-39 KEYWORDS: COWS. LAND RACES. GENETIC DISORDERS.
In this study the uncommon case of dicephalus, biatlanticus, monostomus, tetraopthalmus, dipus, dibrachis monster in native breed of cow is reported.

0179. Bhat, F.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences & Animal Husbandry. Bhattacharyya, H.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences & Animal Husbandry. Management of metritis in crossbred cattle of Kashmir using oxytetracycline, cephalexin and prostaglandin F2. Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 187-189 KEYWORDS: CATTLE. CROSSBREDS. ENDOMETRITIS. DISEASE CONTROL. JAMMU AND KASHMIR.
A total of 36 cows suffering from metritis were divided into 3 groups i.e. group-IA (metritis without palpable CL), Group-IB (metritis without palpable CL) and group-II (metritis with palpable CL) keeping equal number of animals in each group. Animals of group-IA were treated with oxytetracycline 3.0 gm intrauterine daily for 2–4 days; whereas, group-IB animals were treated with cephalexin 4 gm intrauterine daily for 2–4 days. Single intramuscular injection of Dinoprost (PGF2a) 25mg was given to animals of group-II. Recovery rate, on the basis of results of cultural examination, of 3 groups were found as 80.00, 71.43 and 91.67% respectively.

0180. Babu, Praveena; College of Veterinary and Animal Sciences, Mannuthy (India). Centre of Excellence in Pathology. Abraham, Mammen J.; College of Veterinary and Animal Sciences, Mannuthy (India). Centre of Excellence in Pathology. Lalitha kunjamma, C.R.; College of Veterinary and Animal Sciences, Mannuthy (India). Centre of Excellence in Pathology. Vijayan, N.; College of Veterinary and Animal Sciences, Mannuthy (India). Centre of Excellence in Pathology. Narayanan, M.K.; College of Veterinary and Animal Sciences, Mannuthy (India) .Centre of Excellence in Pathology. An epidemiological study of canine neoplasms.

Indian Journal of Animal Research (India). (Jun 2012) v. 46(2) p. 196-198 KEYWORDS: DOGS. NEOPLASMS. EPIDEMIOLOGY.
The incidence of neoplasms among canines in Thrissur area of Kerala was studied. Samples were obtained from the canine cases presented to the University Veterinary hospitals of Mannuthy and Kokkalai as well as from the carcasses brought for post mortem examination in the Centre of Excellence in Pathology, College of Veterinary and Animal Sciences, Mannuthy during an year. Collected samples were subjected to histopathological studies for diagnosis of tumour type. Age, sex and breed of the affected animals were analyzed. Sixty one tumour cases were obtained. Sixty six per cent of the tumours were benign. Skin and soft tissue tumours were the common type observed. Maximum cases were observed in the 5 to 8 year group. Fifty eight per cent of the affected animals were females. Breed wise analysis revealed that German shepherds were the most affected.

0181. Murali, Mohan K.; College of Veterinary Science, Hyderabad (India). Department of Animal Reproduction Gynaecology and Obstetrics. Rao, K. Sadasiva; College of Veterinary Science, Hyderabad (India). Department of Animal Reproduction Gynaecology and Obstetrics. Solman, Raju K.G.; College of Veterinary Science, Hyderabad (India). Department of Animal Reproduction Gynaecology and Obstetrics. Sharma, G.P.; College of Veterinary Science, Hyderabad (India). Department of Animal Reproduction Gynaecology and Obstetrics. Effect of hexachlorocyclohexane on pregnanat goats. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 219-224 KEYWORDS: GOATS. PREGNANCY. HCH. TOXICITY.
Eighteen goats with one month pregnancy were randomly divided into control, untreated and treated groups. HCH residues in the cabbage leaves prior to treatment were in the range of 0.1261 to 0.1895 mg kg-1. These levels were lower than the maximum residual limit values (MRL). In treated cabbage leaves with HCH dusting the levels were in the range of 19.8317 to 21.7749 mg kg-1. The blood samples from control, untreated and treated animals at 0 month the HCH residues were in the range of 0.0002 to 0.0003 mg kg-1 and these values are non significant within the groups. The average levels of HCH residues in blood samples from untreated group progressively increased from 0.0003 at 0 month to 0.0018 mg kg-1 at the end of 3rd month. Similarly the HCH values from treated group showed a significant increase from 0 to end of 3rd month with an average value of 0.0002 to 0.0527 mg kg-1. Four animals of treated group were aborted in the fourth month of the experiment and the

average concentration of HCH residues in placenta was 0.0122 mg kg-1. The accumulation of this insecticide in placenta was about 22.2 per cent of maternal blood. Among the organs, the accumulations of HCH residues were higher in fat followed by liver with 0.0548 and 0.0515 mg kg-1, respectively. The consumption levels of HCH in the treated group at 4.04 mg/kg/day was much higher than the MRL and affected gestation and also induced mortality.

0182. Bhat, F.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Bhattacharyya, H.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Khan, M.Z.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences and Animal Husbandry. Studies on prevalence of repeat breeding in crossbred cattle of Kashmir valley. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 306-309 KEYWORDS: CATTLE. CROSSBREDS. PREGNANCY COMPLICATIONS. JAMMU AND KASHMIR.
The prevalence of repeat breeding (RB) was calculated retrospectively for a period of 6 years from 2005 to 2010. The overall prevalence of RB was recorded as 28.31%. Prevalence of repeat breeding was although found to vary from 1st to 5th parity, but the difference was non-significant. However, significantly lowest prevalence was recorded at 6th (6.25%) when compared to other parities. Prevalence of RB with respect to breed, season and different years were found nonsignificant. Ovulatory disturbances (27.30%), ovarian cysts (7.89%) and metritis (18.09%) contributed as some of the major causes of repeat breeding in cattle of rural Kashmir.

0183. Shome, Bibek Ranjan; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Mitra, Susweta Das; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Bhuvana, Mani; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Krithiga, Natesan; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Shome, Rajeswari; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Dhanikachalam, Velu; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Prabhudas, Krishnamshetty; Project Directorate on Animal Disease Monitoring and Surveillance, Bangalore (India). Multiplex PCR for the detection of five important

Staphylococcus sp. in bovine subclinical mastitis milk. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 9-14 KEYWORDS: BOVINE MASTITIS. STAPHYLOCOCCUS. STAPHYLOCOCCUS AUREUS. DIAGNOSIS.

The multiplex PCR (mPCR) was standardized for the direct detection of 5 most significant Staphylococcus sp., viz. Staphylococcus aureus, Staphylococcus chromogenes, Staphylococcus epidermidis, Staphylococcus sciuri and Staphylococcus haemolyticus from milk. Early detection and identification of predominantly Staphylococcus aureus and recent emergence of coagulase-negative staphylococci (CNS) in causing bovine mastitis is important to improve the udder health by effective treatment and control measures. The mPCR assay successfully achieved bacterial identification up to species level based on specific amplification of conserved regions of genes, viz. 23S rRNA (S. aureus), sodA (S. chromogenes and S. haemolyticus), rdr (S. epidermidis) and gap (S. sciuri) genes. The evaluation of mPCR assay with 36 ATCC reference strains and validation with 115 milk samples from subclinically infected herd and 36 bulk milk samples rendered the assay 100% specific and highly efficacious than culture method. The detection limit was found to be from 10 3 to 10 cfu/ml for the 5 target Staphylococcus species. The results suggest the suitability of mPCR assay to rapidly detect and differentiate 5 important Staphylococcus sp. in about 5 h. The method can be adopted for herd surveillance as a part of health management programme.

0184. Jagir Singh; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Ghuman, S.P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Honparkhe, M.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Dadarwal, D.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Dhaliwal, G.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Risk factors for prolonged estrus in crossbred dairy cattle. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 20-23 KEYWORDS: CATTLE. CROSSBREDS. CORPUS LUTEUM. REPRODUCTIVE DISORDERS. RISK FACTORS.

The present study involving 40 crossbred dairy cattle from various private dairy farms in Punjab assessed various risk factors ssociated with prolonged duration of estrus (63.30±2.5 h). About 62.5% cattle had regressed corpus luteum (CL) at estrus, 17.5% cattle were over-conditioned and 30% had daily milk yield 30L. Mean duration of estrus in 60% cattle was 52.5±1.2 h, whereas, remaining 40% exhibited

79.5±2.87 h duration. Plasma progesterone at estrus in the former group was 0.48±0.04 ng/ml compared to 0.59±0.04 ng/ml in the latter group. In both these groups, duration of estrus was not influenced by body condition score (BCS) and regressed CL at estrus. About 75.7% cattle with normal BCS exhibited regressed CL at estrus. Moreover, 75% cattle with 19.11±1.30 litre per day milk yield had regressed CL at estrus in comparison to 33.3% cattle producing 39.67±1.98 litre. Plasma progesterone on the day of estrus was similar in cattle either with or without regressed CL. Luteal deficiency during the phase subsequent to prolonged estrus was recorded in 72.5% cattle. About 40% cattle without regressed CL and 92% cattle with regressed CL at estrus exhibited subsequent luteal inadequacy. About 70% cattle had per day milk yield 30 litre and 82% of these exhibited luteal deficiency at subsequent estrus. In brief, plasma progesterone at estrus is associated with prolonged duration of estrus. Regressed CL may not be the source of suprabasal plasma progesterone, but could be responsible for subsequent luteal inadequacy. High milk yield is associated and over-conditioning is not associated with occurrence of regressed CL at estrus, prolonged duration of estrus and subsequent luteal deficiency.

M12 Aquaculture production and management

0185. Kamalendra; National Bureau of Fish Genetic Resources, Lucknow (India). Kapoor, Smita; National Bureau of Fish Genetic Resources, Lucknow (India). Sharma, J.; Kurukshetra University, Kurukshetra (India). Goswami, M.; National Bureau of Fish Genetic Resources, Lucknow (India). Rathore, G.; National Bureau of Fish Genetic Resources, Lucknow (India). Lakra, W.S.; Central Institute of Fisheries Education, Mumbai (India). Development of primary culture from gills of Tor tor (Hamilton-buchanan). Indian Journal of Animal Sciences (India). (Dec 2011) v. 81(12) p. 1262-1265 KEYWORDS: TOR TOR. FISH CULTURE. GILLS.
Primary culture of gill cells was initiated from gill filament explants of game fish, Tor tor. The explants were cultured in Leibovitz L-15 medium with 5, 10 and 20% foetal bovine serum (FBS). The attachment efficiency of cells was serum-dependent, while increased FBS concentration did not stimulate further proliferation of cells. First radiation of typical gill epithelial cells was observed after 38 h, of attachment of explants. There was high proliferation for the first 7 days then a stable plateau till 10 days, followed by a decline phase from 14th day. Following removal of cells, the explants produced further cell outgrowth which was

especially active at the proliferation phase (10 days). Removal of these cells caused the explants to produce a further proliferation of cells reaching confluency in 4–10 days. The use of gill explants to establish cell culture system of fish has advantages which include longevity of the culture and successive proliferations from explants, which could provide a useful tool for the investigation of toxicological and diagnostic studies.

0186. Paul, B.N.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Das, S.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Giri, S.S.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Chattopadhay, D.N.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Mandai, R.N.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Pandey, B.K.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division Chakraborti, P.P.; Central Institute of Freshwater Aquaculture, Kolkata (India). Wastewater Aquaculture Division. Perfomance of Cirrhinus mrigala fingerlings on feeding dried distillers grain sowble. Indian Journal of Animal Research (India). (Sep 2012) v. 46(3) p. 272-275 KEYWORDS: CIRRHINUS MRIGALA. FISH FEEDING. GROWTH RATE. FEED CONVERSION EFFICIENCY.
A 60-day feeding trial was conducted to study the effect of different levels of dried distillers grain soluble (DDGS) on growth performance of Cirrhinus mrigala fingerlings (average wt. 7.12±0.17g). Four different feeds were formulated with increasing levels of DDGS viz, 0 (DDGS0), 15 (DDGSI5), 30 (DDGS30) and 45 (DDGS45) %, respectively. The net weight gain, specific growth rate (SGR), protein efficiency ratio (PER) were significantly higher (P0.01) in DDGS30 compared to other groups. No significant difference was found among DDGSO, DDGS15 and DDGS45. Feed conversion ratio (FCR) of C. mrigala fingerlings was significantly (P0.01) lower in DDGS30. Survival percentage did not differ significantly at different DDGS levels. Carcass lipid and ash content was significantly (P0.01) higher in DDGS45 compared to other groups. However, carcass moisture and protein content of C. mrigala did not differ significantly among the treatment groups. Thus, from the present experiment it may be concluded that higher growth performance was observed in C. mrigala fingerlings fry by feeding DDGS at 30% level.

Q02 Food processing and preservation

0187. Singh, P.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Department of Livestock Products Technology. Sahoo, J.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Department of Livestock Products Technology. Chatli, M.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Department of Livestock Products Technology.Biswas, A.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Department of Livestock Products Technology. Effect of Clove Powder and Modified Atmosphere Packaging on Storage Quality of Chicken Meat Caruncles During Ambient Storage (35±2oC) conditions. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 51-55 KEYWORDS: POULTRY MEAT. CONTROLLED ATMOSPHERE STORAGE. QUALITY.

Chicken meat caruncles were prepared by utilizing 65% spent hen meat. Treated samples were added with 0.2% clove powder as natural preservative. These were packaged aerobically as well as under modified atmosphere conditions using 50:50 CO 2 /N 2 gas mixture and stored at 35±2 C and 70% RH for a storage period of 60 days. The physico-chemical and microbiological qualities were assessed on 0, 10, 20, 30, 40, 50 and 60 days. At beginning of the storage, modified atmosphere packaged control and treated samples showed significantly lower (P0.05) pH than aerobic samples but there was no significant difference between variants at the end of storage period. Free fatty acid (%) value was significantly lower (P0.05) in modified atmosphere packaged control and treated samples than aerobic counterparts (day 40). Clove treated both aerobic and modified atmosphere packaged samples showed significantly lower (P0.05) peroxide value than their control counterparts. Standard plate count was found to be significantly lower (P0.05) in treated aerobic and treated modified atmosphere packaged samples than their control counterparts throughout the storage period except day 20. Coliform count, S. aureus and yeast and mold count were not detected in any of the test sample throughout the storage. The present study showed that 0.2% clove powder and modified atmosphere packaging showed synergistic effect in terms of free fatty acid value but independent inhibitory action on peroxide value and standard plate count.

0188. Tayde, R.S.; Anand Agricultural University, Anand (India). College of Veterinary Science and Animal Husbandry, Department of Veterinary Public Health. Brahmbhatt, M.N.; Anand Agricultural University, Anand (India). College of Veterinary Science and Animal Husbandry, Department of Veterinary Public Health. Comparison of three Different Selective Media for Isolation of Campylobacter spp. from Poultry. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 61-63 KEYWORDS: POULTRY MEAT. CAMPYLOBACTER. ISOLATION. GUJARAT.

A total of 150 samples including raw poultry meat (90) and intestinal (caecal) contents (60) were collected from the retail meat market in and around Anand city. All the samples were processed by selective enrichment method using three different selective enrichment broths viz., Park and Sander’s enrichment broth, Preston enrichment broth and blood free Campylobacter selective broth followed by plating on the respective selective medium viz., Park and Sander’s medium, Preston agar and blood free Campylobacter selective agar and incubated at 42 C for 24-48 h under microaerophilic conditions. Among 52 Campylobacter isolates recovered, Park and Sander’s medium recovered 44 (84.61%) isolates compared to 43 (82.69%) and 33 (63.46%) isolates recovered on blood free Campylobacter selective agar and Preston agar, respectively.

0189. Muzaddadi, A.U.; Central Agricultural University, Tripura (India). Basu, S.; Central Agricultural University, Tripura (India). An accelerated process for fermented fish (seedal) production in Northeast region of India. Indian Journal of Animal Sciences (India). (Jan 2012) v. 82(1) p. 98-106 KEYWORDS: FERMENTED FOODS. FISH. TRIPURA.

Seedal is a traditional semi-fermented fish product of Northeast India. It is prepared with minor carp belonging to the genus Puntius which is endemic to the region. Fish is fermented in specially designed earthen pots normally for 5–6 months. This restricts the production to only 2 batches per year. Two predominant bacteria from fresh seedal and inprocess study were isolated and identified as coagulase-negative Staphylococcus aureus and Micrococcus varians. A mixed starter culture of these 2 organisms was incorporated to the raw material during processing along with 2 food additives, i.e. common salt and sugar in different concentrations and combinations for accelerating the process. The accelerated method could be achieved by using 2% salt, 2% sugar and 100 ml bacterial inoculum (10 cell/ml) of S. aureus and M. varians in traditional method and the

fermentation period could be reduced to 45 days without losing the basic biochemical, microbiological and sensory characteristics of traditional best quality seedal. The quality of new Seedal was evaluated by 10 judges drawn from regular seedal eater. The scores given in 10 point hedonic scale were statistically analyzed. No significant difference was observed in comparison to the best quality traditional seedal.The storage characteristics of new seeldal and the traditional seedal were studied with different concentrations of salt in polythene bags at room temperature. The new seedal could be stored with 10% salt for 15 days keeping acceptable quality and the traditional seedal could be stored for 10 days at same conditions.

Q03 Food contamination and toxicology

0190. Mane, B.G.; Indian Veterinary Research Institute, Izatnagar (India). Mendiratta, S.K.; Indian Veterinary Research Institute, Izatnagar (India). Tiwari, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Sharma, B.D.; Indian Veterinary Research Institute, Izatnagar (India). Bhilegaokar, K.N. .; Indian Veterinary Research Institute, Izatnagar (India). Anjaneyulu, A.S.R; Indian Veterinary Research Institute, Izatnagar (India). Detection of pork in admixed meat and meat products by species-specific PCR technique. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1178-1181 KEYWORDS: PORK. PCR. ADULTERATION.
The objective of this study was to detect the adulteration of pork in meat and meat products employing PCR assay. A PCR assay was successfully optimized for amplification of 263 bp DNA fragment extracted from pork using designed species-specific primer pairs based on mitochondrial 16S rRNA gene. The optimized PCR assay was subsequently validated for its specificity with DNA extracted from cattle, buffalo, sheep, goat, pig and chicken meat. The primer pair was found to be specific for pork and no cross reaction was observed with other species used in this study. Subsequently, optimized PCR assay was evaluated for its efficiency to amplify the DNA extracted from heat treated meat and meat emulsion. No adverse effect of heat treatments was found on PCR amplification of pork DNA. Thus, the developed primer pairs were found to be specific for pig.

0191. P.V. Chakravarthi; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Microbiology. K. Shanmugasundaram; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Microbiology. S. Malmarugan; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Microbiology. K. Sugumar; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Microbiology. In vitro Assessment of Bacteriostatic Potency of Egg Yolk Immunoglobulin against Salmonella Typhimurium. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 39-42 KEYWORDS: EGG YOLK. IMMUNOGLOBULINS. POISONING. FOODBORNE DISEASES. SALMONELLA TYPHIMURIUM.

The present study was carried out in commercial layer chickens to assess the bacteriostatic potency of egg yolk immunoglobulin IgY against food poisoning pathogen. The O antigen of food poisoning pathogen Salmonella was prepared and used to immunize commercial layer chickens. The eggs which contain anti-Salmonella IgY were collected on 30th day of first injection and stored at 4 C. The antibacterial IgY was separated by water dilution method (10 times diluted with distilled water, pH 5.05.5, incubated at 4 o C for 6 hr) and purified by 60% ammonium sulphate. The recovery of IgY was in range of 57-62 %. The pathogens in tryptic soya broth (approx. 6x10 8 / ml) were cultured with specific IgY 20 mg /ml and inhibitory effect was measured in UV spectrophotometer at 550 nm. The resultant growth curve indicated that the application of polyclonal antibodies (IgY) on meat could be used to prevent the Salmonella food poisoning.

0192. Shekhar, C.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences.Upadhyay, A.K.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences. Singh, S.P.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). College of Veterinary and Animal Sciences. Prevalence of Salmonella in Foods of Animal Origin and its Public Health Significance. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p. 57-60 KEYWORDS: POULTRY MEAT. EGGS. PORK. SALMONELLA. PUBLIC HEALTH.

Total 417 samples from foods of animal origin comprising poultry meat (212) poultry eggs (49) and pork (156) were aseptically collected for the isolation of Salmonella from Pantnagar, Nagla, Lalkuan and Rudrapur. Total 5 Salmonella isolates were recovered from poultry meat (2), poultry eggs

(1) and pork (2). The maximum prevalence was observed in poultry eggs (2.04%), followed by pork (1.28%) and poultry meat (0.94%). Salmonella isolates recovered from different samples were sent for serotyping and were identified as Salmonella Typhimurium and Salmonella Weltevreden. The most prevalent serovar was Salmonella Typhimurium, followed by Salmonella Weltevreden.

0193. Singh, R.V.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Bhilegaonkar, K.N.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Agarwal, R.K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Rawat, S.; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Public Health. Presumptive Count of Clostridium perfringens in Iron Milk Medium from Meat Samples. Journal of Veterinary Public Health. (Jan 2013) v. 11(1) p.69-71 KEYWORDS: POULTRY MEAT. GOAT MEAT. BUFFALO MEAT. CLOSTRIDIUM PERFRINGENS. CLOSTRIDIUM. MEAT. QUALITY.

The study was undertaken to determine the presumptive count of Clostridium perfringens in 90 meat samples (30 samples each of buffalo, goat and poultry,) using iron milk medium (IMM). The meat samples were collected from retail shops and slaughter houses in and around Bareilly city. In the study, most of the samples (57.75%) showed MPN counts of C. perfringens to be 1100 with the highest in goat meat samples (76.6%), followed by poultry (50%) and then buffalo (46.6%). Lower MPN counts were observed as 8.8%,12.2% and 21.1% in meat samples, in which the MPN counts ranges between 501-1100, 100 and 100-500,respectively.

Q04 Food composition

0194. Sanjeev Kumar; National Dairy Research Institute, Karnal (India). Kanawjia, S.K.; National Dairy Research Institute, Karnal (India). Suryamani Kumar; National Dairy Research Institute, Karnal (India). Influence of different level of casein/fat ratio on textural characteristics of buffalo feta type cheese. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1064-1067 KEYWORDS: CHEESE. CASEIN. RIPENING. QUALITY.

The effect of different level of casein/fat (C/F) ratio on textural characteristics of buffalo feta type cheese were investigated up to 2 months of ripening. The rate and extent of textural development during ripening can be monitor by

measuring some of the quantifiable rheological characteristics of cheese in terms of hardness, cohesiveness, springiness, gumminess and chewiness were determined by employing textural profile analyzer (TPA) during ripening period at 15 days interval. The maximum hardness was found with cheese prepared using C/F ratio of 0.80, while the minimum hardness was found with C/F ratio of 0.60 throughout the ripening period. The maximum cohesiveness and springiness was found in cheese made with C/F ratio of 0.80 and minimum cohesiveness and, springiness was found in cheese made with C/F ratio of 0.60. However, cohesiveness and springiness of all experimental cheeses decreased throughout the ripening period.

0195. Gupta, B.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). School of Public Health and Zoonoses. Ghatak, S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). School of Public Health and Zoonoses. Gill, J.P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). School of Public Health and Zoonoses. Prevalence and Characterization of Pathogenic Aeromonas spp. Isolates from Fish and Fish Products. Journal of Veterinary Public Health (India). (Jan 2013) v. 11(1) p. 19-26 KEYWORDS: AEROMONAS. FISH PRODUCTS.

The present study was conducted to study the prevalence and to characterize Aeromonas spp. isolates prevalent in fish and fish products. A total of 184 samples comprising 96 raw fish and 88 readyto-eat (RTE) fish products were collected from Ludhiana and other parts of Punjab and were put to test for Aeromonas spp. employing suitable microbiological methods. From raw fish samples 38(39.58%) Aeromonas spp. were isolated. From RTE fish product, 2 (2.27%) Aeromonas spp. were isolated. Overall incidence was 21.73%. In vitro virulence characterization of isolates revealed that majority of the isolates were haemolytic, while moderate fractions of the isolates were positive for other virulence traits. Molecular characterization for virulent gene AHCYTOEN revealed that 5 (12.5%) isolates out of 40 were positive for the gene, among these 4 (10%) were from raw fish samples and 1 (2.5%) was from RTE fish products. Results of the present study highlighted the potential microbiological hazards in fish and RTE fish products in the study area that warrants intervention to ensure fish food safety and safeguard public health.

Q52 Feed processing and preservation

0196. Saijpaul, S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Grewal, R.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Lamba, J.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition. Saini, A.L.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Department of Animal Nutrition.. Evaluation of Plastic and HDPE Bags as Alternatives to Pit for Silage Preparation. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 109-115 KEYWORDS: SILAGE. SILAGE MAKING.

This study investigated the quality of silage prepared in plastic or HDPE poly bags in comparison to silage prepared in pit. Chaffed oat fodder was compacted in translucent plastic bag (OSbT), HDPE plastic bag (OSbHDPE) or in the pit (OSp). After 45 days all the samples were found to be free from mold with comparable pH. The ammonia N (NH3-N) as % of total N was within the normal limits in OSbT and OSp but was more than 10% in OSbHDPE The buffering capacity was similar in OSbT and OSbHDPE but was lower than OSp. Acetic acid was the predominant fatty acid with small amount of propionic acid but butyric acid was absent. The CP was higher in OSbT and OSbHDPE as compared to OSp. The water soluble carbohydrate was higher in OSbT but remained similar in OSbHDPE and OSp. The acid detergent insoluble N (ADIN) and ADIN as % of total N were comparable in all the silages. The truly digestible non-fiber carbohydrate (tdNFC) was lower in silage made in pit against silage made in polybags. The truly digestible CP forage (tdCPf) was higher in OSbT and OSbHDPE than OSp. The digestion kinetics of DM, OM and NDF indicated higher soluble fraction, lower degradable fraction in the polybag silages as compared to pit silage. Effective degradability of DM and NDF were similar in OSbT and OSp but lower in OSbHDPE. It may be concluded that translucent plastic bags are better alternative to pit and HDPE plastic bag for making good quality silage.

Q54 Feed composition

0197. Chatterjee, A.; National Dairy Research Institute, Kalyani (India). Ghosh, M.K.; National Dairy Research Institute, Kalyani (India). Roy, P.K.; National Dairy Research Institute, Kalyani (India). Das, S.K.; National Dairy Research Institute, Kalyani (India). Santra, A.; National Dairy Research Institute,

Kalyani (India). Macro and micro-mineral status of feeds and fodders in West Kameng district of Arunachal Pradesh. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1076-1079 KEYWORDS: FEEDS. FORAGE. FEED CROPS. TRACE ELEMENTS. MINERAL CONTENT. ARUNACHAL PRADESH.

In the present study an attempt was made to assess the mineral status of feeds and fodder commonly fed to the livestock of West Kameng district of Arunachal Pradesh. Samples of feeds and fodder were collected from nine representative sites of varying altitude (5000 to 10000 ft asl) and analyzed for some important minerals. The dry roughages were deficient in most of the macro-minerals except phosphorus in paddy straw and calcium and phosphorus in dry grasses. Micro-mineral content in dry grasses were optimum. Paddy straw contained adequate level of cobalt and manganese whereas, millet straw contained adequate level of cobalt, iron and manganese. The pasture grasses were deficient in Ca, Mg and K. The tree fodders in this region were rich source of Fe, Mn and Co, adequate in Cu and deficient in Zn. Most of the concentrate feed ingredients were adequate in P, Fe, Co and Cu but deficient in Ca, Mg, Na and K, Zn and Mn. This account of the macro and micro-mineral content of feeds/fodder resources should help in strategic supplementation intended to alleviate local deficiencies for improving the productivity of livestock of this region.

0198. Jena, M.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Das, S.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Mishra, S.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Swain, R.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India). Dehuri, P.K.; Orissa University of Agriculture and Technology, Bhubaneshwar (India).. Mineral profile of feeds, fodders and cattle in north-eastern coastal plain zone of Odisha. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1143-1147 KEYWORDS: FEEDS. FORAGE. MINERAL CONTENT. ORISSA.

Sample of feeds and fodders and serum samples of cows in 8 villages, 2 from each block and 2 blocks from each of the 2 districts namely Jajpur and Balesore of north eastern coastal plain zone (NECPZ) of Odisha were collected and analysed for macro and micro mineral content. Among the fodders, paddy straw was deficient in calcium (Ca), phosphorus (P), copper (Cu) and manganese (Mn). Deficiency of P was observed in

most of the fodders. Most of the concentrates contained higher level of the analysed minerals. The average serum Ca, P, zinc (Zn), Cu, Mn and iron (Fe) content of cows in NECPZ were found to be 6.57±0.15 mg/dl, 3.57±0.11 mg/dl, 0.86±0.02ppm, 0.68±0.01 ppm, 0.26±0.006 ppm and 2.54±0.03 ppm, respectively. The percentage of animals deficient in serum Ca, P, Zn, Cu and Mn were observed to be 75.0, 75.0, 26.6, 31.6 and 28.3 %, respectively. The mean serum mineral content of the animals of NECPZ was deficient in Ca and P. The serum glucose, cholesterol, protein, albumin and globulin content of the animals in NECPZ were 43.64±1.49 mg/dl, 65.10±2.32 mg/dl, 4.23±0.12 g/dl, 2.11±0.05 g/dl and 2.11±0.09 g/dl, respectively.

0199. Gupta, A.; Indian Grassland and Fodder Research Institute, Jhansi (India). Singh, S.; Indian Grassland and Fodder Research Institute, Jhansi (India). Kundu, S.S.; Indian Grassland and Fodder Research Institute, Jhansi (India). Jha, N.; Indian Grassland and Fodder Research Institute, Jhansi (India). Evaluation of tropical feedstuffs for carbohydrate and protein fractions by CNCP system. Indian Journal of Animal Sciences (India). (Nov 2011) v. 81(11) p. 1154-1160 KEYWORDS: OILSEED CAKES. GRAIN FEED. ROUGHAGE. PROXIMATE COMPOSITION. MINERAL CONTENT.
Seventeen feed ingredients comprising protein sources (linseed cake-LSC, mustard seed cake-MSC, cotton seed cake-CSC, soybean cake-SBC and groundnut cake-GNC), energy sources (deoiled rice bran-DORB, maize grain-MG, barley grain-BG and wheat bran-WB), legume roughages (berseem, cowpea hay-CH, Stylosanthes hamata-SH and Acacia catechu-AC) and non-legume roughages (ammoniated wheat straw-AWS, guinea grass-GG, maize fodder -MF and sorghum fodder-SF) were evaluated for carbohydrate and nitrogen fractions as well as mineral contents. In CNCP system, crude protein content of feed is partitioned into 5 fractions (A, B 1 , B 2 , B and C) and carbohydrate into 4 fractions (A, B 1 , B 2 3 and C) according to degradation rates. The proximate composition, cell wall constituents, carbohydrate and nitrogen fractions of different feeds vary significantly amongst the groups. The CHO, C , and Cc fractions of carbohydrate were higher in energy, while C A and C B2 NSC fraction of CHO were more in protein sources. Total CHO and C B2 fraction of carbohydrates were more in non-legume while C A , C and Cc fractions were higher in legume roughages. Amongst the studied feedstuffs P A and P B NSC fractions of protein were higher in protein sources, while P fractions were higher in energy sources. Legumes exhibited

higher contents of P B2 4 , C B1 B2 , P B3 , while non-legume had higher P , P B1 and P fraction of protein. Concentration of macro (%) and micro minerals (ppm) of feed stuffs differed across feeds (energy and protein) and roughages (legumes and non legumes). B3 It is concluded from the present study that feedstuffs chemical properties for carbohydrate and nitrogen fractions are unique and different. Therefore feed ingredients selection based on CNCPS evaluation will be more logical for formulating efficient diets for livestock.

0200. Mondal, S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Department of Animal Nutrition. Haldar, S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Department of Animal Nutrition. Samanta, I.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Department of Animal Nutrition. Samanta, G.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Department of Animal Nutrition. Ghosh, T.K.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Department of Animal Nutrition.. Exploring Nutritive Potential of Undigested Rumen Contents as an Ingredient in Feeding of Goats. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 79-88 KEYWORDS: GOATS. BIODEGRADABILITY. NUTRITIVE VALUE.
The present study was aimed at assessing the safety of dried rumen contents (DRC) for animal feeding. Dumped undigested rumen contents were collected on the day of slaughter (day 0) and subsequently on day 3 and 5 after the first dumping and were subjected to quantitative microbiological assessment. The total number of the aerobic and E. coli increased (P0.001) upto day 3 post-dumping and declined thereafter. However, the counts for Staphylococus aureus increased significantly (P0.001) on day 5 post-dumping, although within the limit specified by the WHO for animal feeds. The pathogenic potential of the rumen contents determined by various standard tests including PCR screening for Staphylococcal enterotoxin A production and animal inoculation tests, indicated that the isolates were non-pathogenic. Subsequently, the DRC was evaluated in using 15 Black Bengal goats divided into 3 groups and fed diets containing 0, 5 and 10% DRC replacing equivalent amount of wheat bran. Results of the feeding trial indicated that there is no adverse impact of DRC on the digestibility of nutrients, growth and feed efficiency. It is concluded that dried rumen content may be considered as absolutely safe for animal consumption and can be included in the diet of goats without any deleterious influence on the nutrient utilization.

0201. Singh, Sultan; Indian Grassland and Fodder Research Institute, Jhansi (India). Plant Animal Relationship Division. Shukla, G.P.; Indian Grassland and Fodder Research Institute, Jhansi (India). Plant Animal Relationship Division. Gehrana, Deepika; Indian Grassland and Fodder Research Institute, Jhansi (India). Plant Animal Relationship Division. Diversity in Dual Purpose Sorghum Hybrids for Nutritional Traits, Methane Production and Energy Value for Animal Production Functions. Indian Journal of Animal Nutrition (India). (Mar 2012) v. 29(1) p. 24-32 KEYWORDS: SORGHUM. FEED GRASSES. ENERGY VALUE. FEED INTAKE.

Present study assesses the nutritional status of 22 dual purpose sorghum hybrids grown in 3 replications under identical soil and agronomic conditions in the sorghum fodder improvement programme. Samples of hybrids were collected at 50% flowering and analyzed for their crude protein (CP), fiber fractions, in sacco dry matter degradability (ISDMD) and other nutritional attributes viz. total digestible nutrients (TDN), metabolizable energy (ME), relative feed value (RFV), net energy for lactation (NEL), net energy for growth (NEG), net energy for maintenance (NEM), intake and stem to leaf ratio (S: L). Average CP content of the hybrids was found about 10%, while mean concentrations of NDF, ADF, cellulose and lignin were 63.25, 37.39, 30.17 and 4.93%, respectively. DMI (%) and RFV ranged between 1.69 to 2.33 and 80.30 to 105.80 across the hybrids. Lowest ISDMD was recorded in 353A x PC-6 (65.93) against highest in 479A x SPV1727 (82.21%). Carbohydrate and its fractions viz. non fiber carbohydrate (NFC), structural carbohydrate (SC) and lignin bound carbohydrate (CC) differed significantly (P0.05) amongst the evaluated hybrids. Mean TDN, DE and ME contents were 56.28%, 3.44 (Kcal/g) and 2.82 (K cal/g) of the tested hybrids. Mean net energy (NEL) contents of the hybrids were 1.26 k cal/g with lowest value observed in 324 A x EWT 64 DTN (1.14) against highest in 479A x SPV1727 and 486A x HC308 hybrid (1.40). Methane production (g/Kg DDM) varied (P0.05) amongst the hybrids and was highest from hybrid464 X S490 (80.45) and lowest from hybrid 479A x HD 19 (47.70) with hybrids mean value of 62.50. Results revealed that significant variability exists in CP, fiber, DMI, ISDMD, RFV and NEL values of evaluated hybrids. Hybrids 479A x HD 19 and 486A x HC 308 had moderate to high CP and ISDMD, low ADF and cellulose, higher energy values and low methane emission.

U10 Mathematical and statistical methods

0202. Upasna, S.; National Bureau of Animal Genetic Resources, Karnal (India). Banerjee, Priyanka; National Bureau of Animal Genetic Resources, Karnal (India). Joshi, Jyoti; National Bureau of Animal Genetic Resources, Karnal (India). Vijh, R.K.; National Bureau of Animal Genetic Resources, Karnal (India). Bayesian and multivariate analysis of buffaloes of Indo-Gangetic plains for revealing cryptic spatial patterns of genetic variability. Indian Journal of Animal Sciences (India). (Oct 2011) v. 81(10) p. 1039-1043 KEYWORDS: WATER BUFFALOES. SPATIAL DISTRIBUTION. GEOGRAPHICAL DISTRIBUTION. STATISTICAL METHODS. INDIA. MICROSATELLITES.

The blood samples of 625 buffaloes collected from 34 sampling locations of Indo-Gangetic plains were collected and DNA isolated. The genotype data was generated on these animals using 11 microsatellite markers. The multilocus genotype data were analysed to decipher the genetic structures. The data analysis utilised the spatial coordinates to reveal the cryptic spatial patterns of genetic variability. The Bayesian as well as spatial multivariate analysis revealed 5 populations of buffaloes belonging to Indo-Gangetic plains. The F IS and F values were calculated for various populations or clusters formed. The 5 clusters formed using Geo-referenced multilocus genotypes are not in geographic contiguity but reveal cryptic spatial patterns.

0203. Saxena, Pratiksha; Gautam Buddha University, Greater Noida (India). School of Applied Sciences. Pathak, Vinay; Gautam Buddha University, Greater Noida (India). School of Applied Sciences. Kumar, Vinod; Gautam Buddha University, Greater Noida (India). School of Applied Sciences. Algorithm for Animal Diet Formulation. Animal Nutrition and Feed Technology (India). (Jan 2013) v.13(1) p. 139-146 KEYWORDS: STATISTICAL METHODS. NUTRITIONAL REQUIREMENTS.

This paper proposes an algorithm based on Non-linear programming and statistical analysis for animal diet formulation. Most important feature of this technique is use of Non-linear programming which overcomes the drawback of linear approximation of objective function. Algorithm is proposed to explore the area of computer programming in the field of animal diet formulation. Outcome of this technique is applied on sample data and provides optimized set of nutrient ingredients to animal which fulfill the nutrient requirement better than the linear programming technique.

LIST OF CONTRIBUTORS

1. Indian Agricultural Research Institute
   Pusa, New Delhi – 110 012

2. National Research Centre for Sorghum
   Hyderabad-500030,
   Andhra Pradesh

3. Directorate of Rapeseed Mustard
   Sewar, Bharatpur-321303,
   Rajasthan

4. Vevekanand Parvatiya Krishi Anusandhan Sansthan
   Almora-263601, Uttarakhand

5. Directorate of Wheat Research
   P.B.No.158, Aggarsain Marg,
   Karnal-132001, Haryana

6. National Research Centre for Soybean
   Khandwa Road, Indore-452017,
   Madhya Pradesh

7. Indian Grassland & Fodder Research Institute
   Jhansi-284 003, Uttar Pradesh

8. Indian Institute of Sugarcane Research
   Lucknow-226 002, Uttar Pradesh

9. Indian Veterinary Research Institute
   Izatnagar-243122, Uttar Pradesh

10. Indian Agricultural Statistics Research Institute
    Library Avenue, Pusa,
    New Delhi-110012

11. National Centre for Agricultural Economics & Policy Research
    Library Avenue, Pusa,
    New Delhi-11012

12. Central Institute for Research on Buffaloes
    Sirsa Road, Hisar-125001, Haryana

13. National Research Centre for Equines
    Hisar-125001, Haryana

14. Central Inland Fisheries Research Institute
    Barrackpore-700120, West Bengal

15. National Institute of Research on Jute & Allied Fibre Technology
    12, Regent Park, Kolkata-700040,
    West Bengal

16. Directorate of Oilseeds Research
    Hyderabad-500 030, Andhra Pradesh

17. Central Potato Research Institute
    Shimla-171 001, Himachal Pradesh

18. Central Tobacco Research Institute
    Bhaskar Nagar, Rajamundry-533105, Andhra Pradesh

19. Central Plantation Crops Research Institute
    Kasargod-671124, Kerala

20. National Bureau of Animal Genetic Resource

P.B. No.129, Karnal-132 001,
Haryana

21. Central Research Institute for Jute & Allied Fibres
Nilganj, Barrackpore-700120, West Bengal

22. Central Research Institute for Dryland Agriculture
Hyderabad-500 059,
Andhra Pradesh

23. Central Avian Research Institute
Izatnagar-243 122, Uttar Pradesh

24. Directorate of Experiment Station
G.B. Pant Univ. of Agri. & Technology
Pantnagar – 263 145, Distt. Udham Singh Nagar, Uttarakhand

25. Indian Agricultural Statistical Reserch Institute
Librarary Avenu, Pusa, New Delhi

26. Central Institute of Brackishwater Aquaculture
75, Santhome High Road,
Raja Annamalaipuram,
Chennai-600028, Tamilnadu

27. Central Institute of Fisheries Education
Panch Marg, off yari Road, Andheri (West),
Mumbai-400061, Maharashtra

28. Central Institute for Research on Goats
Makhdoom, Mathura-281122,
Uttar Pradesh

29. Crop Protection Research Centre (CPRC)
St. Xavier's College, Tirunelveli,
Tamilnadu

30. Central Soil Salinity Research Institute
Karnal 132001, Haryana

31. Central Tuber Crops Research Institute
Sreekariyam, Thiruvananthapuram -695017, Kerala

32. National Bureau of Animal Genetic Resources
G.T. Road Bye-Pass, P.B.No.129,
Near Basant Vihar,
Karnal-132001, Haryana

33. National Bureau of Plant Genetic Resources
Pusa Campus, New Delhi 110012

34. National Centre for Integrated Pest Management
LBS Building, Pusa Campus,
New Delhi-110012

35. National Dairy Research Institute
Karnal-132001, Haryana

36. National Research Centre on Camel
Post Bag No.07, Jorbeer,
Bikaner-334001, Rajasthan

37. Directorate of Groundnut Research
Ivenagar Road P.B.No.5,
Junagadh-362001, Gujarat

38. National Research Centre for Citrus
Nagpur, Maharashtra

39. National Research Centre on Mithun
Jharnapani, P.O. Medziphema-797106

40. Directorate of Knowledge Management in Agriculture (DKMA)
ICAR, KAB-I, Pusa Campus, New Delhi-110012

41. Indian Institute of Pulses Research (IIPR)
Kalyanpur, Kanpur-208024 (U.P.)

42. Central Rice Research Institute
Cuttack-753006 (Odisha)

43. Society for Plant Protection Sciences
Div. of Nematology, LBS Centre, IARI, Pusa Campus,
New Delhi-110012

44. Soil Conservation Society of India National Societies Block A/G-4 NASC Complex, DP Shastri Marg Pusa, New Delhi-110012

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